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(54) Apparatus for positioning a cladding panel

(57) The invention provides apparatus for positioning a cladding panel (1) against a wall on which it is to be secured. The apparatus comprises a support (2,21) means for supporting the cladding panel with respect to the wall (47), locating means (16,40) for locating an edge of the panel (1) in proximity to the wall (47), including engagement means for engagement (57) with a previously fitted panel (1), and biasing means (50) for biasing the engagement means against the previously fitted panel towards the wall (47). The apparatus locates the edge of the panel (1) to be fitted in relation to an adjoining edge of the previously fitted panel without interference within the previously fitted panel (1).

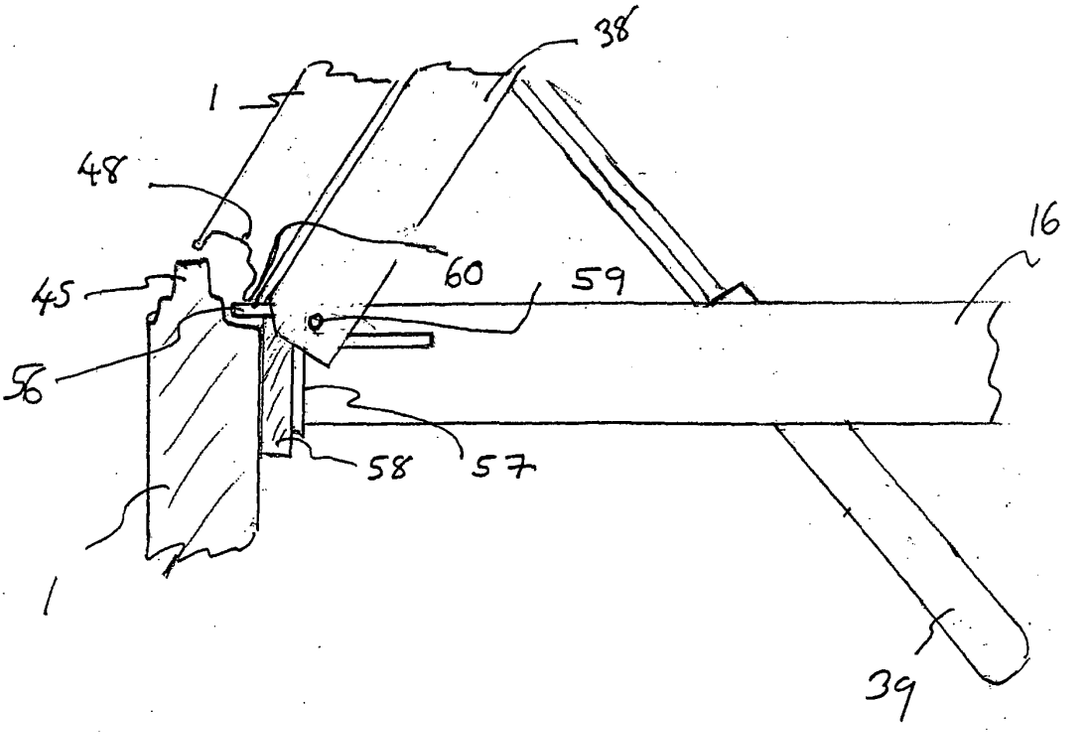

FIG 6

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Description

[0001] The present invention is concerned with an apparatus for the positioning of a load, especially for the fine positioning of a load. The present invention is particularly, although not exclusively, concerned with the use of the apparatus for the fine positioning of awkward loads that are difficult to handle and need to be fixed into place at elevated positions.

[0002] The use of composite roof and wall cladding panels in the construction of buildings, especially those of an industrial nature, is an increasingly common feature of the modern landscape. Such cladding panels can offer considerable benefits in terms of appearance, weather resistance, fire resistance and sound reduction for a building and typically have very good heat insulating properties.

[0003] However, the placement of the cladding panels around the circumference of a building or its use as a roofing material is a difficult operation in spite of the interlocking (usually tongue and groove) provided on the cladding.

[0004] The difficulty essentially arises from the dimensions of the cladding panels manufactured and used - which makes handling by workmen a difficult and strenuous operation. The situation is not improved by the fact that often the surface of the cladding panel is corrugated and/or has a leather grain or similar grain finish making the use of vacuum suckers difficult or near impossible.

[0005] Although hand-held pincers or hook arrangements may be used as an aid to handling cladding panels they do not offer a satisfactory solution for accurate placement since the movement by workmen of a heavy load over short distances is typically jerky and complicated by susceptibility to fatigue-induced shake.

[0006] The problem is exaggerated when the dimensions of a building are such that cladding panels are to be placed from an elevated position. The placement, whether row upon row or column beside column then demands the use of a boom or scissor lift which restricts the area by which the load may be supported whilst still requiring controlled support with lifting and lowering by workmen into final position.

[0007] Such an operation is further complicated by the fact that it is difficult to achieve the optimal height of scissor or boom lifts since they are difficult to operate so as to effect slight incremental changes in height or position.

[0008] The apparatus described in GB patent application no. 0105602.7 improves upon this situation and offers the advantages of a speedier, safer and less strenuous operation in the placement of awkward loads whilst reducing the number of workmen required.

[0009] GB patent application no. 0105602.7 describes an apparatus for the positioning of a load, comprising a first support having a bearing surface, an elongate, movable carrier member postionable to bear on the bearing surface with load-engagement means projecting beyond the load-bearing surface and a second support for counteracting the turning moment acting on the carrier member when carrying the load by the load-engagement means. In this arrangement the position of the load is adjustable by varying the position of the carrier member on the said bearing surface, and in which the said means for counteracting the turning moment comprises a further support acting in use to resist turning of the said elongate carrier member about said support under the action of the load.

[0010] GB0105602.7 also describes apparatus for positioning a cladding panel against a wall ready for fixing, comprising means for supporting the cladding panel with its major plane in a generally horizontal orientation, means for locating an edge of the panel in proximity to the wall on which it is to be secured, and tilt means for turning the cladding panel from its horizontal orientation to a generally upright orientation with its plane substantially parallel to the wall in preparation for fitting thereto.

[0011] A problem with both these arrangements and with the second arrangement in particular is that it can be difficult to locate the edge of a cladding panel to be fitted both in relation to the wall and to an adjoining edge of a previously fitted panel on which the panel is to be fixed. This situation is not improved by the fact that the edges of the panels often interlock by means of a tongue and groove arrangement. A situation therefore arises in which the panel to be fitted must be supported in relation to the previously fitted panel without engaging the adjoining edge of the previously fitted panel so that it may be placed into a final position without causing damage to the adjoining edges of the panels, and in the case of interlocking panels the interlocking tongue and groove elements.

[0012] The present invention seeks to improve upon this situation and to offer the advantages of a speedier, safer and less strenuous operation in the placement of adjoining panels whilst reducing the likelihood for damage of the adjoining edges of the panels.

[0013] The present invention provides support means for supporting the cladding panel with respect to the wall, locating means for locating an edge of the panel in proximity to the wall, the said locating means including engagement means for engagement with a previously fitted panel, and biasing means for biasing the said engagement means against the said previously fitted panel towards the wall, whereby to locate the said edge of the panel to be fitted in relation to an adjoining edge of the previously fitted panel. This has the advantage that the biasing means causes the previously fitted panel to be securely held against or in relation to the wall and thereby readily enables the panel to be fitted to be located along the adjoining edge of the previously fitted panel both before and during movement of the panel to its final position without damage being caused to the adjoining edges of the respective panels.

[0014] Preferably the apparatus further comprises tilt means for turning the panel to be secured about the said edge from a generally horizontal orientation to a gener-

ally upright orientation. In this way it is possible to locate the edge of the panel to be fitted in close proximity to the adjoining edge of the previously fitted panel when the panel to be fitted is in its horizontal orientation and then rotate the panel to its upright vertical orientation about its adjoining edge. This is particularly advantageous for interlocking panels having tongue and groove elements for example, since the panel can be readily rotated into interlocking engagement with the previously fitted panel without interference between the tongue and groove of the respective panels during turning.

[0015] Preferably the said engagement means comprises a panel support member for supporting the said panel to be fitted on its edge at all angular positions during turning.

[0016] In preferred embodiments the panel support comprises a first support member for separating the said previously fitted panel and the said panel to be fitted along their respective adjoining edges, and a second support member for engagement with the previously fitted panel. This readily enables the panel that is to be fitted to be supported during turning without contact with the previously fitted panel and in such a way that the panel support member simultaneously engages the previously fitted panel such that accurate positioning of the panels can be readily achieved.

[0017] Preferably the said first and second support members are arranged with respect to one another to define a generally L-shaped member for engaging an edge of the said previously fitted panel. In this way the L-shaped member can provide a vertical part for engagement with a vertical surface of the previously fitted panel and a generally horizontal member for supporting the adjoining edge of the panel to be fitted during turning.

[0018] Preferably a panel protection member is mounted to the L-shaped member in the region between the first and second support members for contact with the previously fitted panel. The panel protection member may comprise a foam pad or other compressible or non-compressible material suitable for contacting the exterior surface of the panel to prevent damage thereto due to uneven loading along the edge of the panel by the vertical member of the panel support member.

[0019] In preferred embodiments the said locating means comprises a movable carrier member with the said engagement means being located at one end of the said carrier. This readily enables the panels to be located in proximity to the wall and in proximity to the adjoining edge of the previously fitted panel.

[0020] Preferably the said tilt means comprises a tilt member pivoted to the said carrier member for turning the said panel to be fitted between its horizontal and vertical positions and parallel with the said tilt member. In this way it is possible to support the panel to be fitted over at least a major part of its surface at all angular positions during turning.

[0021] In preferred embodiments the tilt member is pivoted at a point at the end of the carrier member in close proximity to the panel support member so that the panel to be fitted is tilted substantially on its adjoining edge about the pivot axis of the tilt member. In this way it is possible for the panel to lie flat against the tilt member in all angular positions between its horizontal and vertical orientation. This is particularly advantageous for interconnecting panels having tongue and groove interconnection elements since the groove in the edge of the panel to be fitted can be readily rotated over the projecting tongue of the previously fitted panel without interference as the panel is tilted.

[0022] Preferably the said biasing means is fixed with respect to the said support means for biasing the said carrier member in the direction of the wall. This readily enables the biasing means to act between the support and the carrier member so that the carrier member can be moved with respect to the support either with or against the biasing force.

[0023] In preferred embodiments the apparatus further comprises an actuator for moving the said carrier member against the biasing force of the said biasing means. The actuator may be powered, however in preferred embodiments the actuator is provided by a positioning winch fixed in relation to the carrier member which may be manually operated from engagement with the previously fitted panel.

[0024] Preferably the said biasing means comprises a telescopic gas cylinder and piston. This provides for a compact and lightweight structure capable of providing adequate biasing force against the previously fitted panel.

[0025] Preferably the said support means comprises a first support having a load bearing surface on which the carrier member is supported with the engagement means projecting beyond the said load bearing surface, and a second support including means for counteracting the turning moment acting on the carrier member when supporting the said panel to be fitted, and whereby the position of the said panel in relation to the wall is varied by varying the position of the carrier member of the said bearing surface.

[0026] Preferably the apparatus further comprises adjustment means for adjusting the height of the said engagement means.

[0027] Preferably the said support means forms part of, or is attachable to, a support platform the height of which is adjustable.

[0028] Preferably the said support platform is part of or carried by a boom or scissor lift.

[0029] Preferably the support or supports are fixed or integral to extension trays provided on said scissor lift.

[0030] Preferably the said movable carrier member is cantilevered.

[0031] Preferably the said adjustment means comprise at least one telescopically adjustable leg of said support means.

[0032] An aspect of the invention includes a kit of

parts for assembling the apparatus of the invention. The kit of parts may provide the said load bearing support, the said locating means including the said engagement means, and the said biasing means.

[0033] A further aspect of the invention includes the use of the apparatus or the kit of parts according to the invention in a method of positioning a cladding panel to an inside or outside wall of a building.

[0034] The present invention also provides a method of positioning and/or fixing composite cladding or panels to the outer or inner circumference or the roof of a building.

[0035] Various arrangements and an embodiment of the invention will now be more particularly described by way of non-limiting example with reference to the following drawings in which:

Figure 1 is an isometric view of an arrangement for the vertical placement of a composite cladding or panel;

Figure 2 is an isometric view of a second embodiment useful in the horizontal placement of composite cladding or panel;

Figure 3 is an isometric view of a first embodiment of the present invention, similar to the view of Figure 2;

Figure 4 is a side view of the embodiment of Figure 3 in use;

Figure 5 is a side view of the traveller of Figure 3; and

Figure 6 is a side view of the panel engagement tool of Figure 4.

[0036] Referring now to Figure 1 of the drawings, a support, generally designated 2, for supporting a composite cladding or panel 1 on a scissor lift (not shown), comprises a base plate 3 having two upstanding and colinear hollow columns 4 of equal height. A jack 5 is optionally fixed to base plate 3 so that the jack is centrally and co-linearly located between columns 4. Alternatively jack 5 may be there positioned prior to the use of the apparatus. Base plate 3 has apertures 6 for receipt of screws for fixing the base plate to the main part of or to the extension trays of a scissor lift.

[0037] Columns 4 on base plate 3 are suitable for receipt of legs from the posts 8 of a trestle, generally designated 7. A cross-beam 9 of greater length than the length between posts 8 is fixed across the top thereof so as to define a continuous upper face 10 there across and somewhat beyond. The cross-beam 9 is further supported by strut 11 fixed to post 8 and cross-beam 9. The framework is strengthened by a lower transverse beam 12 fixed between posts 8. The lower surface 13 of transverse beam 12 provides a contacting surface for the screw 14 of jack 5. The upper surface 15 of cross-beam 9 provides a contacting surface for a load supporting member 16. Although load supporting beam 16 is shown as substantially planar it is by no means limited in this respect and may instead be substantially box square or cylindrical.

[0038] Carrier member or load support beam 16 is provided with a positioning handle 17 to aid displacement across the upper surface 15 of cross-beam 9. Cross-beam 9 is provided with walls 18 upstanding from upper surface 15 so as to prevent support beam 16 from travelling off the trestle. Load support beam 16 is equipped, at a proximal end, with a pin 19 of an appropriate size for engagement in holes 20 provided in cladding or panel 1.

[0039] The apparatus includes a further support, generally designated 21. Support 21 is at least of similar width and of similar design to support 2 (thus like elements will be numbered according). Support 21 is provided by a trestle 7 comprising posts 8, cross-beam 9, strut 11 and transverse beam 12. However support 21 is intended to be of greater height than support 2. Thus posts 8 are of greater length than in support 2 and are also non-detachably fixed to or made integral to a base plate 3. Cross-beam 9 of support 21, of similar width to that of support 2, is optimally formed from a substantially heavier material. Further cross-beam 9 is now provided with a slot 22 extending along the major part of its width and of sufficient height to receive load support beam 16. Load support beam 16 is equipped, at a distal end, with cross-pins 23 intended to prevent load support beam 16 from slipping out of slot 22. The lower surface 25 of upper member 24 of slot 22 therefore provides a counteracting surface that prevents rotation of the load support beam 16 about support 2 under the influence of a load.

[0040] This arrangement may be used on a scissor lift for the placement of cladding panels. For this, the operator, having determined on vertical placement, will adjust the scissor lift so as to allow deployment of the extension trays in a direction perpendicular to the surface to be covered. The operator may then fix base plate 3 of support 2 and support 21 on the main part of the lift or on respective extension trays. Support 2 and support 21 will preferably be placed so that they are substantially parallel with respect to each other and the shortest length of the wall or cage element on the lift. In the completed assembly of this configuration, and provided their heights allow, cross-beams 9 may extend across the whole of the width of the lift. In order to complete the assembly the operator will first place the legs of trestle 7 in columns 4 on base plate 3 and having constructed support 2, the proximal end of load support beam 16 is threaded through slot 22 of cross-beam 9 of support 21 and brought to rest at least on the upper surface 15 of cross-beam 9 on support 2. Of course it will be understood that positioning handle 17 will be configured so as not to prevent this operation when the load support beam 16 cannot be rotated within the slot 22. Jack 5 can arranged so as to exert a slight upward force between the base plate 3 and transverse beam 12 on support 2. The apparatus is now ready for the engagement of the cladding panel to be fitted.

[0041] The cladding panel is orientated on the ground so that its greater length is parallel to the wall or cage element of the lift and if necessary lifted by workmen to thread pin 19 through hole 20 provided in the top edge of the cladding panel. The scissor lift is then operated so as to begin to raise one end of the cladding panel away from the ground. The lifting process may be facilitated by guide means in the form of a wheel-bearing corner sleeve for the cladding panel although often manual supervision by workmen on the ground will suffice. Once the cladding panel is off the ground and vertically aligned close to the surface to be covered the scissor lift is operated to deliver the cladding panel to a position approximately level to or above the point to which it is to be attached. At this position the jack may be engaged to raise the position of the load support beam 16 by the vertical adjustment of the height of cross-beam 9. Thus a tongue provided in the cladding or panel is positioned to a point of vertical height just above the slot provided in another. Meanwhile the positioning handle 17 is operated to displace the load support beam 16 along and/or across the upper surface 15 of cross-beam 9 and provide an alignment of tongue and slot with respect to longitudinal and lateral position. Finally the jack is again engaged to drop the vertical height of cross-beam 19 and lower, tongue into slot. Pin 19 may now be disengaged from hole 20, and if necessary by further operation of the jack. The final placement maybe then secured by exertion of a downward pressure on the upper edge of the cladding or panel by the workmen.

[0042] Referring now to Figure 2 of the drawings an arrangement for the placement of composite cladding or panel in rows consists of a parallel arrangement of two supports 2 and two supports 21 each pair having therewith a load support beam 16. In this configuration the operator, having determined on horizontal placement (not shown), will configure the scissor lift so as to allow deployment of the extension trays in a direction parallel to the surface to be covered. The operator may then fix base plate 3 of each support 2 and each support 21 on the main part of the lift or the respective extension trays. Supports 2 and supports 21 will preferably be placed so that they are substantially parallel with respect to each other and the longest length of the wall or cage element on the lift. It will be noted that in the completed assembly each pair of supports 2 or 21 is outwardly facing from each other so as to allow the maximum range across which the load may moved. The assembly is completed in exactly the same way for each pair of supports as described for the first embodiment.

[0043] The cladding panel 1 is then orientated on the ground so that its greater length is parallel to the wall or cage element of the lift pins 19 threaded through holes 20 provided in the lateral edge of the cladding panel (not shown). The scissor lift is then operated so as to raise the cladding panel to a position approximately level to or above the point to which it is to be attached. The process of horizontal placement is continued in a similar way to that previously described. Of course it will be realised that operation of jacks 5 are preferably conducted at the same time in this later process.

[0044] Referring now to the embodiment of Figure 3 of the drawings, which shows an arrangement similar to that of Figure 2, which allows horizontal positioning with temporary storage of a plurality of cladding panels 1 on the scissor or boom lift.

[0045] Thus, supports 21 are each provided with a fixed, load support beam 26. Support beams 26, which traverse cross beams 9 in a directional perpendicular thereto, are each fixed to an additional vertical post 27 positioned, in the gap between the two support assemblies 21, in parallel with the posts 8 located towards the inwardly facing ends between each support 21. A rail 28, parallel to support beam 26, reinforces the framework by connecting vertical posts 27 with posts 8 of each support. In this embodiment support beams 26, vertical posts 27 and rails 28 are removably attached by bolting to each other, to the supports 21 and to the floor of the scissor or boom lift, as the case may be.

[0046] Load support beams 26 provide upper surfaces 29 which are of sufficient longitudinal and lateral dimension adequately to support a number of cladding panels spanning the gap between the two support assemblies 21 whilst, at the same time, allowing the operator to move the cladding panel 1 onto the load-support beam 16.

[0047] The load support beam 16 according to this embodiment is equipped with a number of additional features to the arrangement shown in Figure 2. In particular, the handle 17 provided on support beam 16 is replaced with a traveller, generally designated 30, for moving the cladding or panel 1 along the support beam. Referring also to Figure 5, the traveller 30 consists of a, generally U-shaped, slide bracket 31 which is dimensioned so as to fit snugly over a portion of the upper half of the load support beam 16. The slide bracket 31, is provided with a handle 32 welded for example to its outwardly facing limb 33 (with reference to Figure 3). The opposite, inwardly facing limb 34 of slide bracket 31 is provided with a threaded hole for receipt of a threaded fixing pin 35 which can engage the load-support beam 16 so as to lock the relative position of the slide bracket 31 thereon.

[0048] A recess 36, provided in each limb 33, 34 at the proximal or working end of slide bracket 31, allows the slide bracket 31 to pivot on a pin 37 extending from each of the outwardly facing and inwardly facing surfaces at the proximal end of the load support 16.

[0049] The pivot action of the slide bracket 31 is initiated by a tilt plate 38 (See Figure 4) located in the upper surface 15 towards the proximal end of the load support beam 16 which contacts the underside of the slide bracket when pins 37 are engaged. The tilt plate 38, is tilted by an automated pneumatic or hydraulic piston mechanism 39 which is housed within a cavity provided in the load support beam 16. In this embodiment the

mechanism carries its own power supply and is actuated by switching means engaged by the operator. In other embodiments the mechanism includes sensing means linked to the switching means.

[0050] A telescopic gas strut 50 in the form of a gas cylinder and piston spring arrangement is secured at one end to the lower beam of the slot 22 of the support 21 and at the other end to the under surface of the carrier member or load support beam 16. In the embodiment shown in the drawing of Figure 4 the cylinder 51 of the gas spring is secured to the under surface of the load support member 16 and the telescopic element 52 of the strut is secured to the lower beam of the slot 22. Compression of the strut 50 provides a biasing force which biases the load support beam 16 in the direction parallel to the support beam from the second support 21 towards the first support 2. A winch 53 is also fixed to the load support beam 16 for moving the load support beam with respect to the support means 2 and 21 in the direction perpendicular to the longitudinal direction of the beam 9 and slot 22. In the embodiment of Figures 3 and 4 the winch 53 comprises a belt winch in which a belt 54 of the winch extends between the winch and the lower beam of the slot 22 to which it is secured. Tensioning of the belt 54, in use, by the winch 53 enables the load support member 16 to be moved in the direction from the load support 2 towards the load support 21 against the biasing force of the gas spring strut 50 and allows controlled movement in the opposite direction thereof of the load support member by releasing the biasing force of the strut 50. The winch 53 comprises a handle 55 for controlled manual operation of the winch for movement of the load support 16.

[0051] Referring now to Figures 3 and 6, pin 19 at the proximal end of each load support beam is replaced with a holding tool in the form of a panel engaging means, generally designated 40, allowing controlled positioning of the cladding panel 1 on a building wall for engagement with other such previously fitted cladding panels.

[0052] The panel engagement means 40 comprises a generally L-shaped member in which a first support member 56 extends horizontally in the longitudinal direction of the elongate carrier or load support member 16, and a second downwardly projecting support member 57 arranged substantially perpendicular to the first member. A panel protection pad 58 is located within the interior of the L-section of the engagement means 40 between the first and second members. The first and second support members 56, 57 and the panel protection pad 58 are dimensioned so as to allow the pad 58 to engage the edge of a previously fitted panel in the region of the tongue element 45 of the cladding panel without contacting the tongue element and allowing the first support member 56 to provide a support surface adjacent the tongue element 45 for supporting the next panel to be fitted along its outer edge 60 on one side of the groove 48 in the adjoining edge of the panel to be fitted. The first support member 56 and panel protection pad 58 are dimensioned such that when the protection pad 58 engages the edge of the previously fitted panel the proximal end of the first support member 56 is positioned in close proximity to the tongue element 45 such that the support member 56 and the base of the tongue element provide a barrier to slippage of the cladding panel to be fitted. By positioning the pivot axis 59 of the tilt plate 38 at the end of the load support beam 16 in close proximity to the L-shaped support member slippage of the panel to be fitted on the support surface of the first support member 56 is minimised.

[0053] Having regard now to Figure 4, at the beginning of the operation, the scissor or boom lift is positioned alongside the wall to be covered and loaded with a number of cladding panels 1 on the auxiliary support members 26 spanning the gap between supports 21. The scissor or boom lift is then elevated to the required height against the building wall 47 and the load support beam 16 is positioned with its proximal end and first support member 56 of the engagement means 40 above the tongue elements 45 of a cladding panel 1 already fixed to the wall 47, using the winch 53 and the jacks 5 provided with each support 2. In this position the biasing force of the gas spring strut 50 holds the protection pad 58 in fixed engagement with the edge of the previously fitted panel.

[0054] Once the load support beam 16 is positioned, the jack 5 is operated to lower the inside surfaces of first and second support members 56, 57 over the outside edge of the tongue elements 45 of cladding or panel 1.

[0055] A cladding panel 1 is then moved from the pile supported by beams 26 onto the slide bracket 31 provided on support beam 16. The fixing pin 35 is slackened and the slide bracket 31 and cladding panel 1 moved along the support beam 16 by the operators so that recesses 36 in the slide bracket 31 engage pins 37. The operators then engage the tilt mechanism which tilts the slide bracket 31 and the cladding panel 1 onto the engagement means or positioning tool 40 and against the wall 47. The tilt mechanism 38 is reversed and the slide bracket 31 returned and fixed at a position towards the distal end of the load support beam 16. The positioning tool 40 is then moved from between the cladding panel 1 and the underlying previously fixed panel by withdrawing the support beam 16 away from the wall 47 using handle on the winch 53. The operators then assist the tongue elements 45 to engage into the groove 48 provided in the introduced cladding panel 1 and fix the cladding panel 1 to the wall 47 by pins (not shown) provided in apertures 20.

[0056] The use of the positioning tool 40 in combination with the biasing force of the gas strut is advantageous in the present invention in that it reduces the risk of the cladding panel 1 slipping from a position in which it is partially or incompletely supported by the tongue elements 45 of other cladding panel 1. Further, the biased engagement of the L-shaped support member over the outer edge of tongue elements 45 at least re-

duces, if not eliminates the effects of sway in the scissor or boom lift which might otherwise lead to the support beam 16 moving away from the wall 47. In effect, the support beam 16 is held stationary with respect to the wall in the event of scissor or boom lift sway with the upper surface 15 of cross beam 9 slipping underneath the lower surface of the support beam 16.

[0057] The gas spring strut may be replaced by any suitable biasing means, for example, a compression spring. The belt winch which may also be replaced by any other suitable means for controlling the movement of the load support beam, for example in other embodiments the winch may be a cable winch and may include a ratchet type arrangement for manually operating the winch and correctly positioning the load support member and panel with respect to the wall.

Claims

1. Apparatus for positioning a cladding panel (1) against a wall (47) on which it is to be secured, the said apparatus comprising support means (2, 21) for supporting the cladding panel with respect to and independently of the wall, locating means (16,40) for locating an edge (48) of the panel in proximity to an adjoining edge (45) of a previously fitted panel on the wall, the said locating means including engagement means (57) for engagement with the said previously fitted panel, and biasing means (50) for biasing the said engagement means against the said previously fitted panel towards the wall, whereby to locate the said edge of the panel to be fitted in relation to the said adjoining edge of the previously fitted panel.

2. Apparatus as claimed in Claim 1 further comprising tilt means (38, 39) for turning the panel to be secured about the said edge from a generally horizontal orientation to a generally upright orientation.

3. Apparatus as claimed in Claim 2 wherein the said engagement means comprises a panel support member (40) for supporting the said panel to be fitted on its edge at all angular positions during turning.

4. Apparatus as claimed in Claim 3 wherein the said panel support member comprises a first support member (56) for separating the said previously fitted panel and the said panel to be fitted along their respective edges, and further comprising a second support member (57) for engagement with the previously fitted panel.

5. Apparatus as claimed in Claim 4 wherein the said first and second support members are arranged with respect to one another to define a generally L-shaped member for engaging an edge of the said previously fitted panel.

6. Apparatus as claimed in Claim 5 wherein a panel protection member (58) is mounted to the L-shaped member in the region between the first and second support members for contact with the previously fitted panel.

7. Apparatus as claimed in any one of claims 2 to 6 wherein the said locating means comprises a movable carrier member (16) with the said engagement means being located at one end of the said carrier.

8. Apparatus as claimed in Claim 7 wherein the said tilt means comprises a tilt member pivoted to the said carrier member for turning the said panel to be fitted between its horizontal and vertical positions and parallel with the said tilt member.

9. Apparatus as claimed in Claim 7 or Claim 8 wherein the said biasing means is fixed with respect to the said support means for biasing the said carrier member in the direction of the wall.

10. Apparatus as claimed in Claims 7 to 9 further comprising an actuator (53) for moving the said carrier member against the bias force of the said biasing means.

11. Apparatus as claimed in any preceding claim wherein the said biasing means comprises a telescopic gas cylinder and piston (51, 52).

12. Apparatus as claimed in any preceding claim wherein the said support means comprises a first support (2) having a load bearing surface (15) on which the carrier member is supported with the engagement means projecting beyond the said load bearing surface, and a second support (21) including means (22) for counteracting the turning moment acting on the carrier member when supporting the said panel to be fitted, and whereby the position of the said panel in relation to the wall is varied by varying the position of the carrier member of the said bearing surface.

13. Apparatus according to any preceding claim further comprising adjustment means (5) for adjusting the height of the said engagement means.

14. Apparatus according to any preceding claim in which the said support means forms part of, or is attachable to, a support platform the height of which is adjustable.

15. Apparatus according to Claim 14, in which the said support platform is part of or carried by a boom or

scissor lift.

16. Apparatus according to Claim 15, in which the support or supports are fixed or integral to extension trays provided on said scissor lift.

17. Apparatus according Claim 7 or any one of Claims 8 to 16 when directly or indirectly dependent on Claim 7, in which the said movable carrier member is cantilevered.

18. Apparatus according to Claim 13, in which the said adjustment means comprise at least one telescopically adjustable leg of said support means.

19. A kit of parts for assembling the apparatus of any preceding claim comprising the said support, the said locating means including the said engagement means, and the said biasing means.

20. Use of the apparatus or kit of any preceding claim, in a method of positioning and/or fixing a cladding panel to an inside or outside wall of a building.

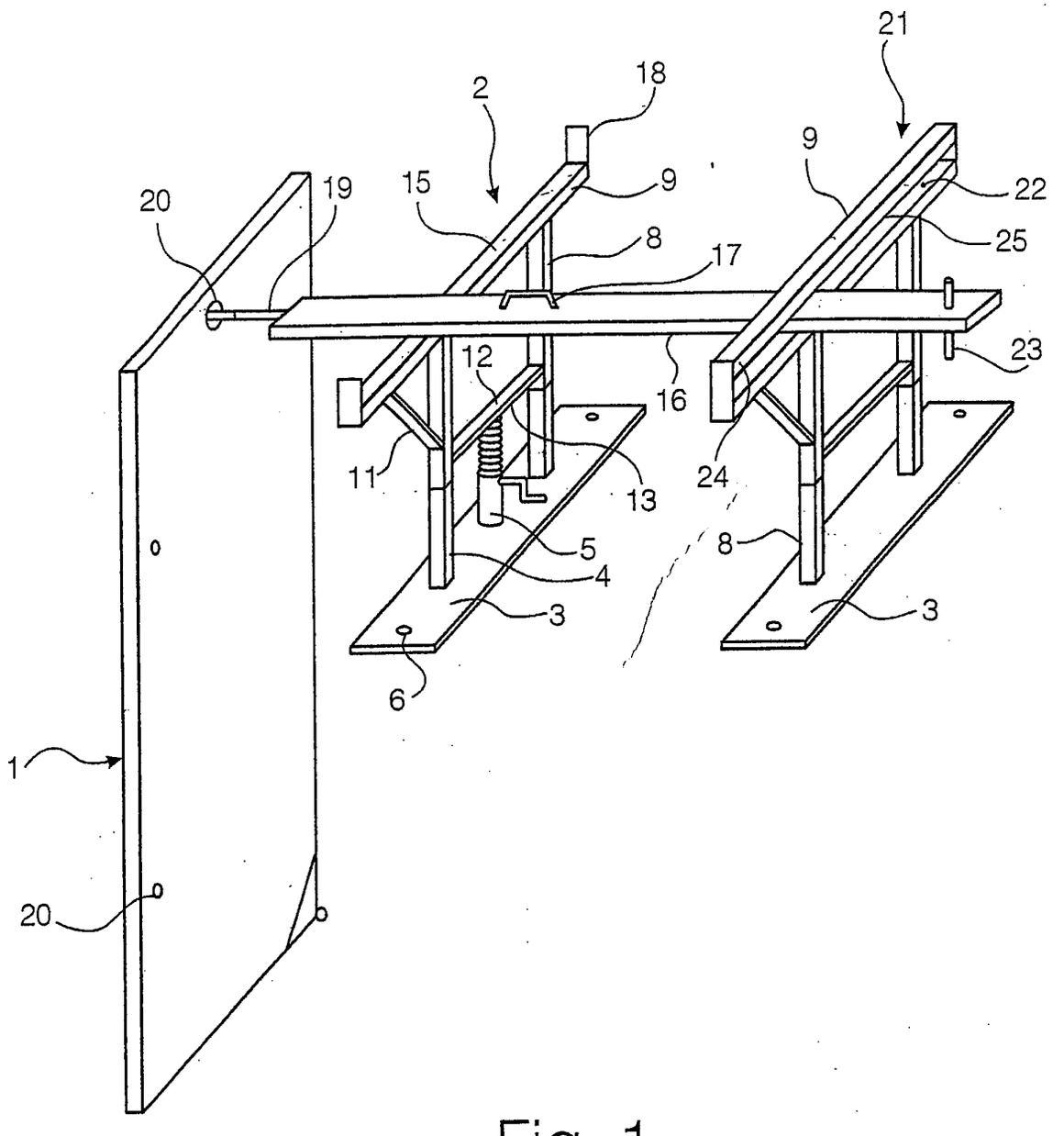

Fig. 1

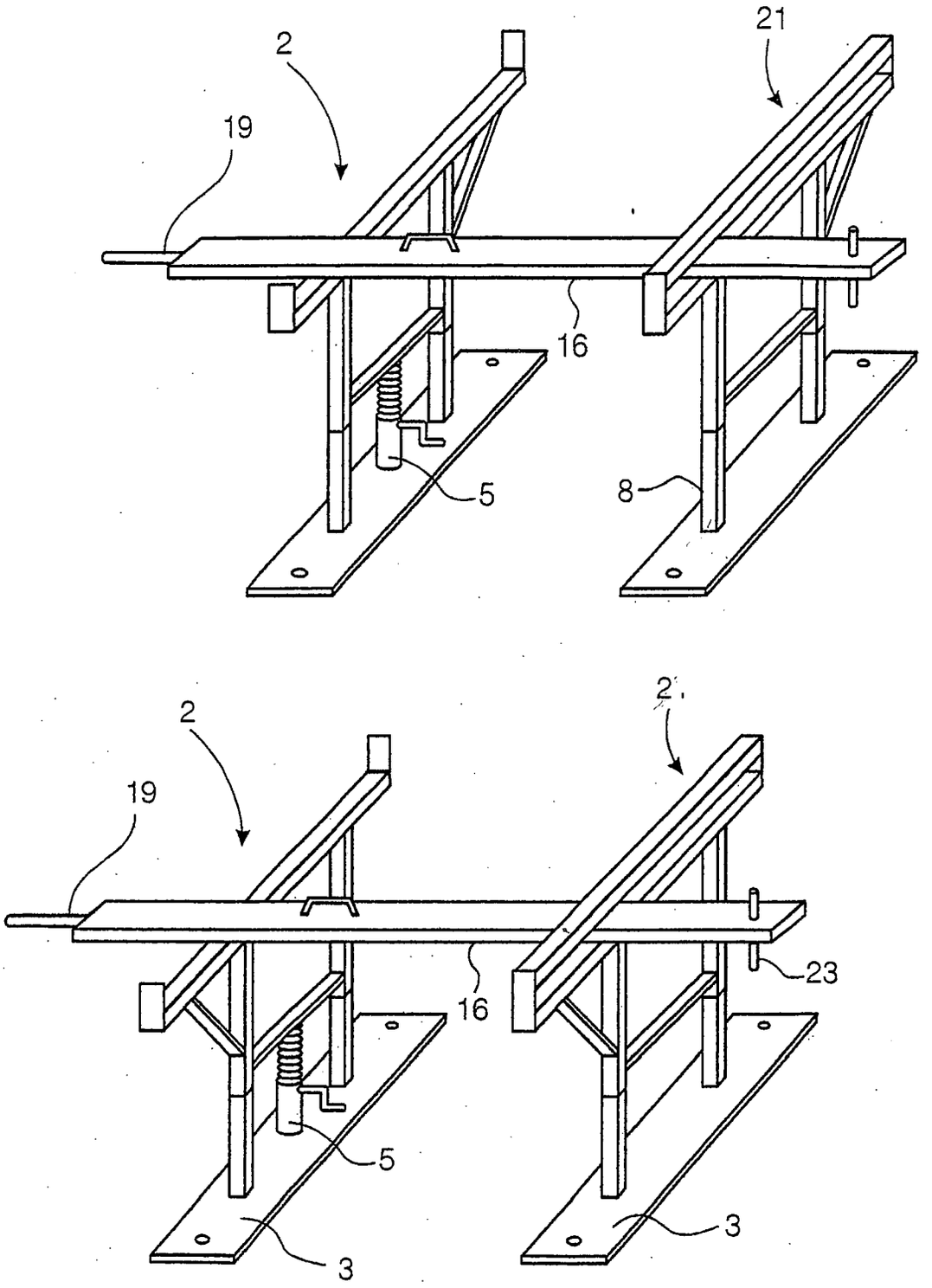

Fig. 2

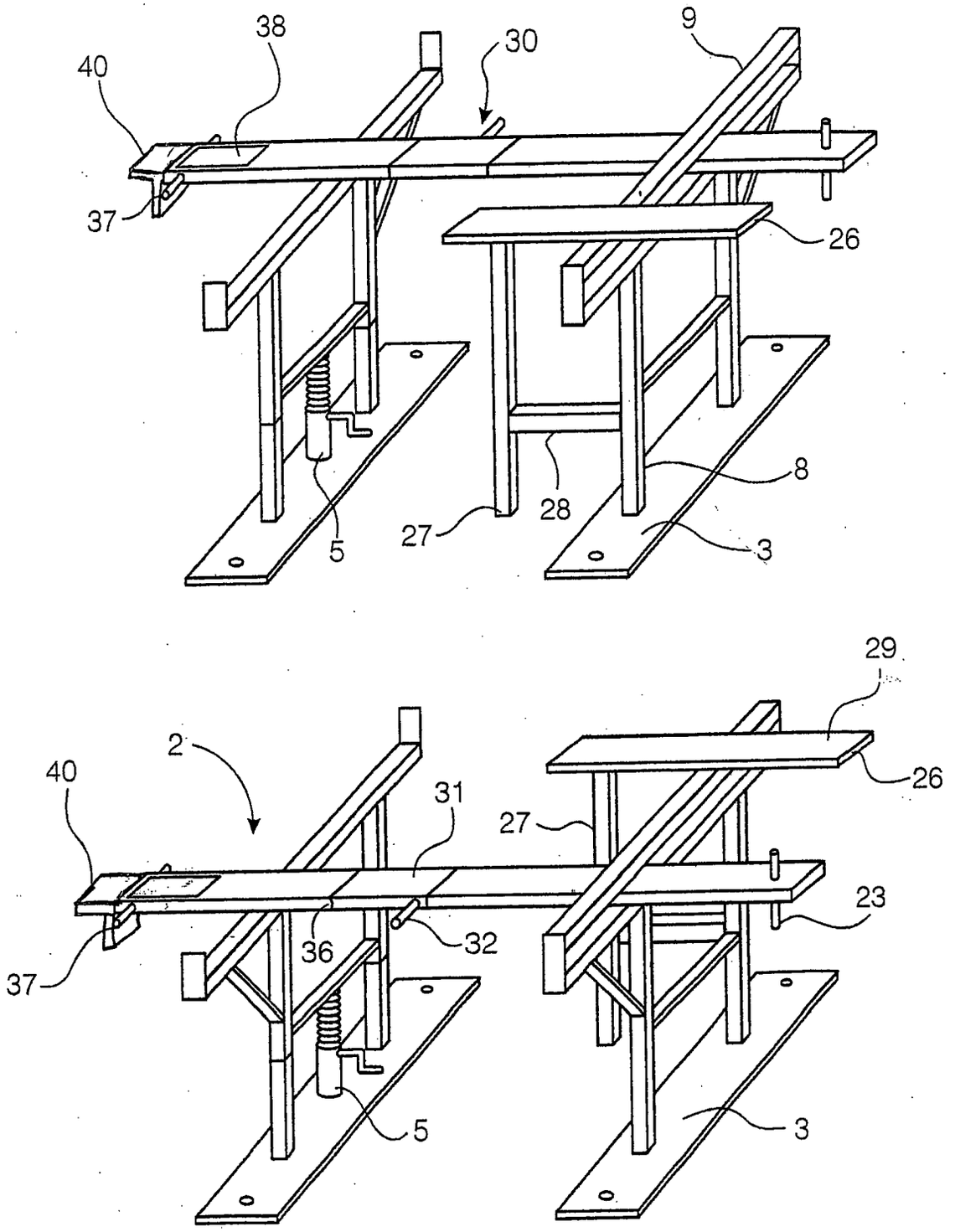

Fig. 3

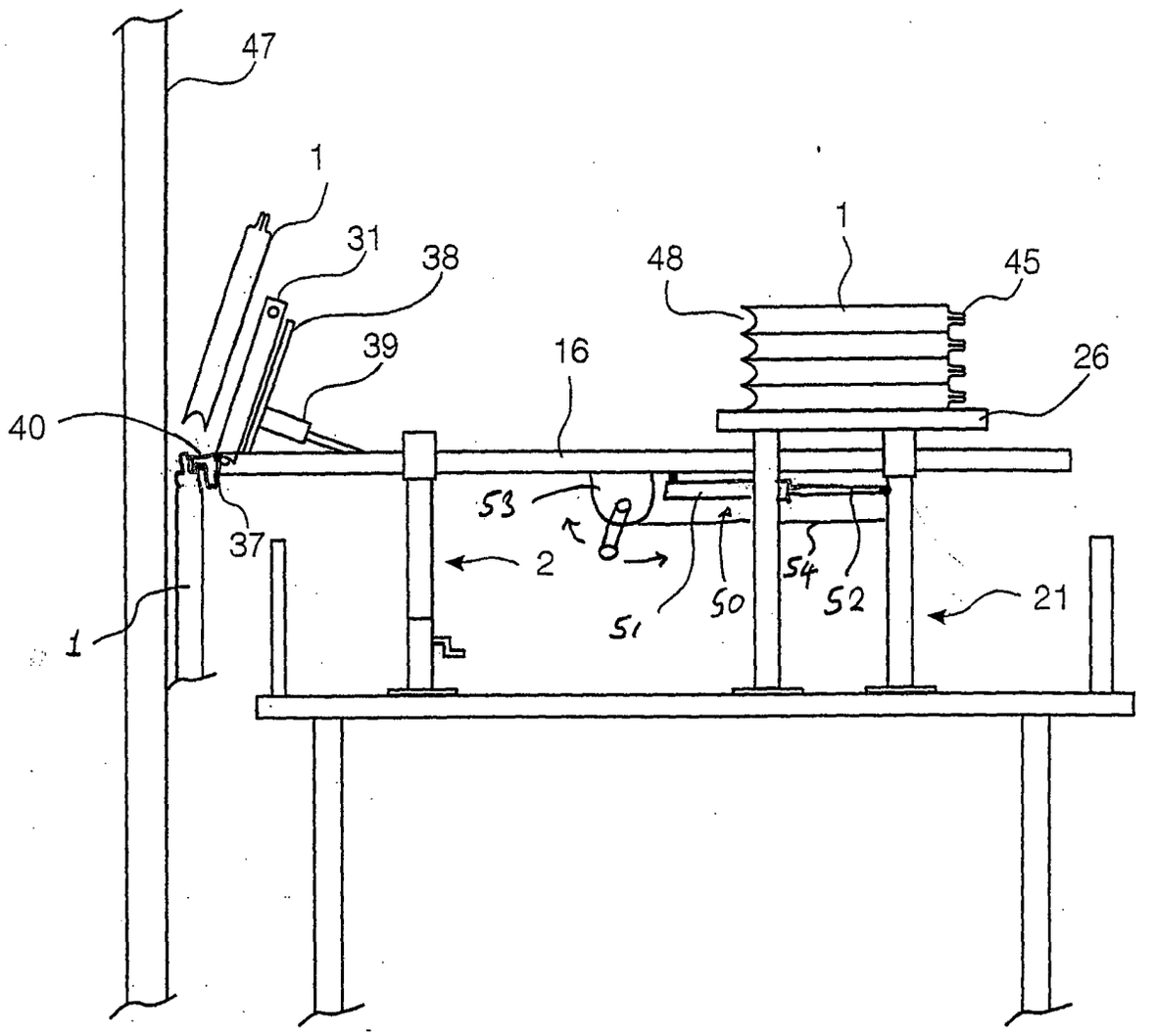

Fig. 4

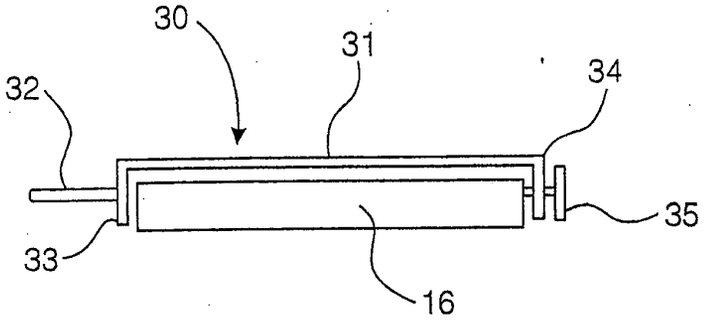

Fig. 5

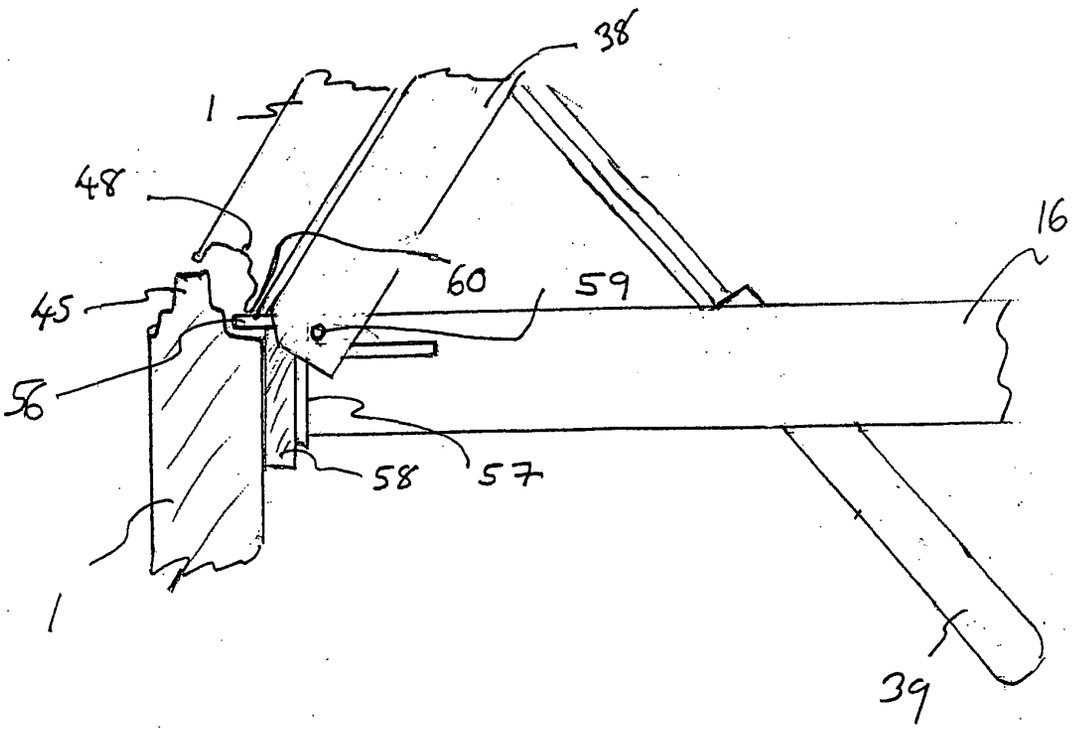

FIG 6