



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.09.2005 Bulletin 2005/36

(51) Int Cl.7: **E05D 7/04**

(21) Application number: **05251151.6**

(22) Date of filing: **26.02.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

(72) Inventors:
• **Milne, Robert George**
Whiston Penkridge Staffordshire ST19 5QH (GB)
• **Jackson, Terrance**
Willenhall West Midlands WV12 4NP (GB)

(30) Priority: **04.03.2004 GB 0404962**

(74) Representative: **Mosey, Stephen George**
MARKS & CLERK,
Alpha Tower,
Suffolk Street Queensway
Birmingham B1 1TT (GB)

(71) Applicant: **Paddock Fabrications Limited**
West Midlands WS2 7NF (GB)

(54) **Hinge**

(57) A height adjustable hinge comprising a hinge body (11), a hinge leaf (16), pivotally mounted to the hinge body (11), the hinge body (11) including a main body portion (12) carrying said leaf (16), and a clamping block (13) for securing the main body portion (12) to a door frame or door, in use. The hinge body includes first and second adjustment screws (25, 26) linking the main body portion (12) and the clamping block (13) to permit

the position of the main body portion (12) relative to the clamping block (13) to be positively adjusted in both opposite directions. The screws (25, 26) are in screw-threaded engagement with respective opposite end regions of the clamping block (13) and each has a head (25a, 26a) which can bear against a surface of a recess (29, 31) in a knuckle (14, 15) of the main body portion (12).

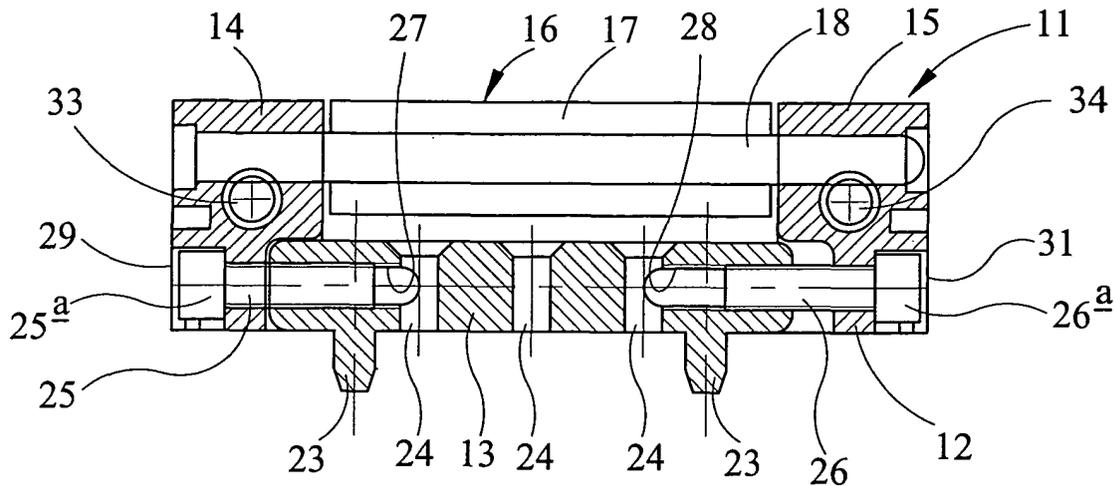


FIG 5

Description

[0001] This invention relates to adjustable hinges, primarily, but not exclusively, for use with UPVC doors.

[0002] Doors are conventionally fitted to door frames by the use of at least two sets of hinges. The alignment of a door within a frame utilising conventional non-adjustable hinges is a repetitious and time consuming process often involving the removal, adjustment, and replacement of the door within the frame a plurality of times.

[0003] Generally a hinge consists of a hinge body which is attached to the door frame (although could be attached to the door in some circumstances) and a hinge leaf pivotally mounted to the hinge body and conventionally fixed to the door (although where the body is fixed to the door the leaf will be fixed to the frame). For convenience, throughout the remainder of this Application, the assumption will be made that the body is attached to the door frame and the leaf is attached to the door.

[0004] It is desirable in some hinge applications to provide a hinge which is height adjustable so that after fitting of the body to the door frame and the leaf to the door the vertical position (the height) of the door within the door frame can be adjusted. A known height adjustable hinge includes a two-part body, a first part of which carries the leaf through the intermediary of a pivot pin, and the second part of which is secured to the door frame by screws, bolts or the like, and clamps the first body part to the door frame. Height adjustment is provided by a generally vertically extending screw, in screw-threaded engagement with the first part of the body, and abutting an end surface of the second part of the body which is positioned at an uppermost end of the second body part in use. Height adjustment is achieved, after fitting the door to the door frame, by slackening the fixing of the second body part to the door frame to slacken the clamping of the first body part, adjustment of the screw relative to the first body part to adjust the vertical position of the first body part relative to the second body part, and then re-tightening the fastening of the second body part to clamp the first body part in position relative to the door frame. The provision of a single screw in threaded engagement with the first body part and bearing against the upper end of the second body part allows the screw to be screwed "downwardly" to lift the first body part relative to the second body part and the door frame, but relies upon gravity to move the first body part for downward adjustment relative to the second body part. Clearly therefore the adjustment of the first body part relative to the second body part is not a positive adjustment, and given that two or more hinges must be adjusted simultaneously, adjustment can be problematic. A further recognised problem is that the fitter may only partially slacken the fixing of the respective second body parts to the door frame and for downward adjustment the grip between the first and second body parts

may be such that it is necessary to hammer the door or the hinge first body parts downwardly thereby risking damage to the door and/or hinges.

[0005] It is an object of the present invention to provide a height adjustable hinge in which the aforementioned problems are obviated.

[0006] In accordance with the present invention there is provided a height adjustable hinge comprising a hinge body, a hinge leaf pivotally mounted to the hinge body, the hinge body including a main body portion carrying said leaf, and a clamping block for securing the main body portion to a door frame or a door in use, the hinge body including screw adjustment means linking the main body portion and the clamping block to permit the position of the main body portion relative to the clamping block to be positively adjusted in both opposite directions.

[0007] Preferably said screw adjustment means includes first and second adjustment screws generally aligned with one another in the direction of adjustment of the main body portion relative to the clamping block, each of said first and second screws being in screw-threaded engagement with respective opposite end regions of the clamping block and each having a head which can bear against a surface of the main body portion remote from the clamping block.

[0008] Preferably the heads of said first and second adjustment screws are received within recesses in opposite ends of the main body portion respectively.

[0009] Desirably said main body portion carries screw adjusters for adjusting the position of the hinge leaf relative to said main body portion in a direction at right angles to the adjustment of the main body portion relative to the clamping block.

[0010] One example of the invention is illustrated in the accompanying drawings wherein: -

Figures 1, 2 and 3 are perspective representations of a hinge in a midposition of height adjustment, a raised position, and a lowered position respectively; Figures 4, 5 and 6 are sectional views of the hinge body of the hinge shown in Figures 1, 2 and 3;

Figures 7, 8, and 9 are plan, side elevational, and inverted, plan views of the main body portion of the hinge body of Figures 1, 2 and 3;

Figures 10, 11, 12, 13, and 14 are rear elevational views of a hinge body showing five stages of height adjustment; and;

Figures 15, 16 and 17 are plan, sectional, and perspective, views respectively of the clamping block of the hinge body of Figures 1, 2 and 3.

[0011] Referring to the drawings, the height adjustable hinge includes a hinge body 11 comprising a main body portion 12 and a clamping block 13 (to be described in more detail hereinafter). The main body portion 12 of the hinge body includes, at opposite ends thereof respectively, first and second parallel knuckles

14, 15 between which is positioned a hollow cylindrical sleeve 17 forming part of the hinge leaf 16. A pivot pin 18 (Figure 5) is received at its ends in passages in the knuckles 14, 15 respectively, and extends through the sleeve 17 to mount the leaf 16 for pivotal movement about the axis of the pin 18 on the main body portion 12 of the hinge body. Although not of particular relevance to the present invention the sleeve 17 has bearing bushes adjacent its ends which engage the pivot pin 18, the bearing bushes including end flanges interposed between the axial ends of the sleeve 17 and the abutting faces of the knuckles 14, 15.

[0012] In use two or more hinges of the kind illustrated in the drawings serve to mount a door to a door frame, each hinge body 11 being secured to the door frame through the intermediary of its respective clamping block 13 and each hinge leaf 16 being secured to the door. The hinges are arranged with their pivot pin axes aligned and vertical. The main body portion 12, the clamping block 13, and the leaf 16 are all conveniently formed as zinc die-castings, but can be formed by other techniques, from other materials, as appropriate.

[0013] The face of the main body portion 12 remote from the knuckles 14, 15 is planar and is formed with a centrally disposed elongate slot 21 which penetrates the region of the body portion 12 between the knuckles 14, 15, and penetrates also the base of recessed regions 14a, 15a (Figure 4 and Figure 7) within the knuckles 14, 15 respectively. The clamping block 13 is elongate, but is of a length less than the length of the slot 21 in the main body portion 12. The width of the clamping block 13 is such that it can extend slidably within the slot 21, and adjacent its outer face (in use) the block 13 has oppositely directed integral wings 22 which can overlie the surface of the main body portion 12 between the knuckles 14, 15 while the remainder of the block 13 extends within the slot 21. The wings 22 are centrally disposed along the length of the block 13, and the length of the wings 22 is less than the spacing between the knuckles 14, 15 by an amount equal to the amount by which the length of the block 13 is less than the length of the slot 21.

[0014] The rear face of the block 13 is provided within integral protruding posts 23 which are received in use in pre-drilled holes in the door frame to facilitate accurate mounting of the clamping blocks 13 to the door frame. Each of the clamping blocks has three parallel bores 24 extending therethrough, the bores being countersunk at the outer face of the block 13, and being intended to receive clamping screws or bolts for rigidly securing the block 13 to the door frame.

[0015] In use, in order to fit the hinge to the door and door frame, firstly the hinge leaf 16 is detached by withdrawing the pivot pin 18 to expose the bores 24 of the block 13. The block 13 is, at this time, slidably received within the slot 21 of the main portion 12, and is secured to the main body portion 12 in a longitudinally adjustable manner, by means of first and second adjustment

screws 25, 26. The screws 25, 26 are longitudinally aligned, and have their shanks in screw-threaded engagement with respective threaded bores 27, 28 extending longitudinally into the end regions of the block 13. Each screw 25, 26 has its head 25a, 26a received within a respective recess 29, 31 in the end face of its respective knuckle 14, 15 and normally each screw 25, 26 is tightened so that its head bears against the base of the respective recess 29, 31.

[0016] It will be recognised that by rotating the screws 25, 26 in opposite directions so that one screw is unscrewed, and the other screw is tightened, then the relative positions of the block 13 and the body 12, along the length of the slot 21, can be adjusted positively in both directions. Thus slackening the screw 25 and tightening the screw 26 moves the knuckle 15 closer to the block 13 so that part of the block 13 fits in the recess 15a, and conversely slackening the screw 26 and tightening the screw 25 moves the knuckle 14 towards the end of the block 13 so that the end of the block 13 can enter the recess 14a.

[0017] Next the hinge body 11 is presented to the door frame and the posts 23 are introduced into the respective apertures in the door frame. Fixing screws or bolts are inserted through the bores 24 and are tightened to clamp the clamp block 13 against the door frame. The spacing between the underface of the wings 22 and the rear face of the block 13 is slightly less than the thickness of the main body portion 12 between the knuckles 14, 15 so that tightening of the fixing screws or bolts of the clamping block causes the wings 22 to bear against the front face of the main body portion 12 between the knuckles, and thus to clamp the body portion 12 against the door frame.

[0018] After fitting of the body of each hinge to the door frame and securing of the respective hinge leaf in a predetermined position on the door by means of screws, each hinge leaf 16 is reassembled between the knuckles 14, 15 of the respective body, the respective pin 18 being reintroduced to provide the pivotal interconnection between the hinge leaf and the hinge body. When initially fitting the hinges each block 13 is arranged in a central position relative to the respective main body portion 12 (as shown in Figure 1, Figure 4, and Figure 12).

[0019] As is apparent from Figures 4 and 12, when the height adjustment of the body portion 12 is in a central position, the screw heads 25a, 26a engage the base of their respective recesses and the block 13 is disposed mid-way between the knuckles 14, 15. In order to adjust this position the screws extending through the bores 24 to secure the block to the door frame are released sufficiently to relax the clamping of the main body portion 12 to the door frame sufficiently to allow the main body portion to move relative to the door frame. If it is desired to raise the door relative to the door frame then the screw 25 of each hinge is rotated to unscrew its respective shank partway from the block 13 thereby lifting its

head 25a away from the base of the respective recess in the knuckle 14 (Figure 11). The weight of the door presses the base of the recess in the knuckle 15 against the head 26a of the screw 26, and the screw 26 is rotated to screw its shank into the block 13 so that the head 26a bearing against the base of the recess 31 in the knuckle 15 lifts the main body portion 12 relative to the door frame, carrying the hinge leaf 16 and the door with it. The screw 26 is tightened until the clearance between the head 25a and the base of the recess 29 in the knuckle 14 is taken up, and once again both screw heads are tight against the base of their respective recess (Figure 10).

[0020] Figures 13 and 14 illustrate adjustment of the hinge body in the opposite direction from the central position. The screw 26a is slackened by unscrewing it from the block 13 to provide a clearance between the head 26a and the base of the recess 31 in the knuckle 15. The screw 25 is then tightened to push the body portion 12 downwardly relative to the block 13 and the door frame to take up the clearance between the head 26a and the base of the recess 31. It will be recognised however that if the clamp block 13 was slackened sufficiently then the weight of the door would cause the movement of the body portion 12 relative to the block 13 as the screw 26a is unscrewed relative to the block 13.

[0021] After re-positioning of each hinge main body portion 12 relative to its respective block 13 and the door frame, the fastenings of the clamping blocks 13 are re-tightened to clamp the main body portions 12 against the door frame.

[0022] Decorative moulded synthetic resin caps 32 are clipped into engagement with the end faces of the knuckles 14, 15 respectively to close the recesses 29, 31 and also to close the ends of the bores in the knuckles 14, 15 through which the pivot pin 18 extends.

[0023] The pivot pin 18 is mounted within the knuckles 14, 15 by means of screw adjusters 33, 34 of any convenient form which permit bodily movement of the pivot pin 18 transversely relative to its longitudinal axis to adjust the positioning in a "fore and aft" direction of the hinge leaf 16 relative to the hinge body 11. It will be understood therefore that the passages in the knuckles 14, 15 within which the pivot pin 18 extends are elongate, rather than circular, in transverse cross-section and the pin is located therein by the screw adjusters 33, 34 which provide a mode of adjustment of the door relative to the door frame at right-angles to the height adjustment provided by the screws 25, 26. The screw adjusters 33, 34 can be of any convenient form, for example as shown in British Patent 2356222, or in British Patent 2276199. The screw adjusters 33, 34 have cross-head screwdriver recesses therein, and the screws 25, 26 can have similar recesses, or, as desired, can have cross-head screwdriver slots, or "Allen-key" recesses.

Claims

1. A height adjustable hinge comprising a hinge body, a hinge leaf pivotally mounted to the hinge body, the hinge body including a main body portion carrying said leaf, and a clamping block for securing the main body portion to a door frame or a door in use, the hinge body including screw adjustment means linking the main body portion and the clamping block to permit the position of the main body portion relative to the clamping block to be positively adjusted in both opposite directions.
2. A hinge as claimed in Claim 1, wherein said screw adjustment means includes first and second screws generally aligned with one another in the direction of adjustment of the main body portion relative to the clamping block, each of the first and second screws being in screw-threaded engagement with respective opposite end regions of the clamping block and each having a head which can bear against a surface of the main body portion remote from the clamping block.
3. A hinge as claimed in Claim 2, wherein the respective heads of the first and second adjustment screws are received within recesses in opposite ends of the main body portion respectively.
4. A hinge as claimed in any one of Claims 1 to 3, wherein the clamping block has a part relatively longitudinally slidably received within an elongate slot in a face of the main body portion.
5. A hinge as claimed in Claim 4, wherein the slot is in a planar face of the main body portion remote from spaced apart knuckles thereof between which knuckles is received part of the hinge leaf.
6. A hinge as claimed in Claim 5, wherein said part of the hinge leaf is a hollow cylindrical sleeve through which extends a pivot pin, respective opposite ends of which are received in respective passages in said knuckles.
7. A hinge as claimed in Claim 5 or Claim 6, wherein said slot is a centrally disposed elongate slot.
8. A hinge as claimed in any one of Claims 5 to 7, wherein the slot penetrates a region of the main body portion between the knuckles and also a base of each of respective recessed regions within the knuckles.
9. A hinge as claimed in any one of Claims 5 to 8, wherein the clamping block has oppositely directed wings which can overlies the surface of the main body portion between the knuckles while the re-

mainder of the block constituted by said longitudinally slidable part extends within the slot.

10. A hinge as claimed in Claim 9, wherein the length of the wings is less than the spacing between the knuckles by an amount equal to the amount by which the length of the clamping block is less than the length of the slot. 5
11. A hinge as claimed in Claim 9 or Claim 10, wherein the wings are centrally disposed along the length of the clamping block. 10
12. A hinge as claimed in any one of Claims 1 to 11, wherein the clamping block has a plurality of bores for screws or bolts to secure the clamping block to a door frame or door, in use. 15
13. A hinge as claimed in any one of Claims 1 to 12, wherein the clamping block has rearwardly protruding projections to be received, in use, in pre-drilled holes in the door frame or door, in use. 20
14. A hinge as claimed in any one of the preceding claims, in which said main body portion carries screw adjusters for adjusting the position of the hinge leaf relative to said main body portion in a direction at right angles to the adjustment of the main body portion relative to the clamping block. 25
30
15. A hinge substantially as hereinbefore described, with reference to, and as shown in, the accompanying drawings. 35
40
45
50
55

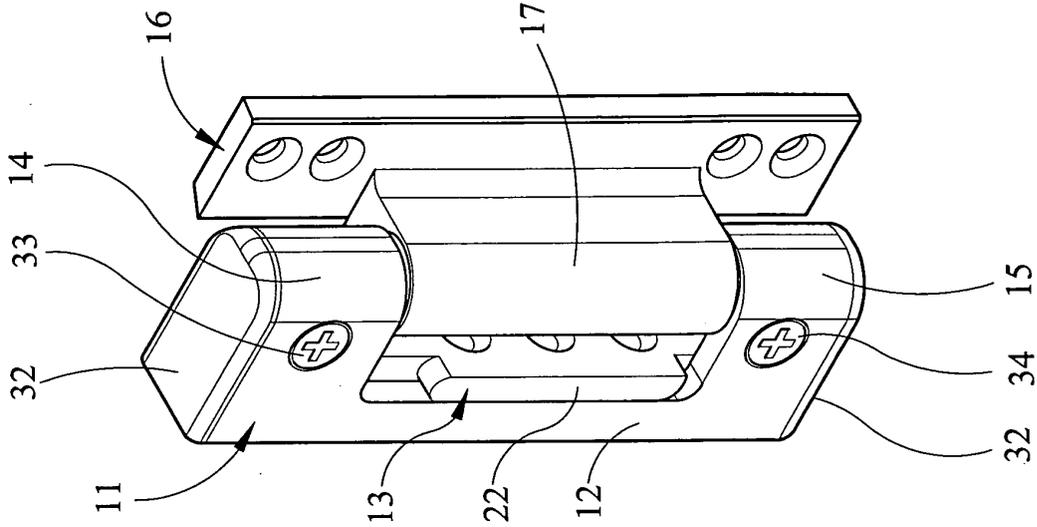


FIG 1

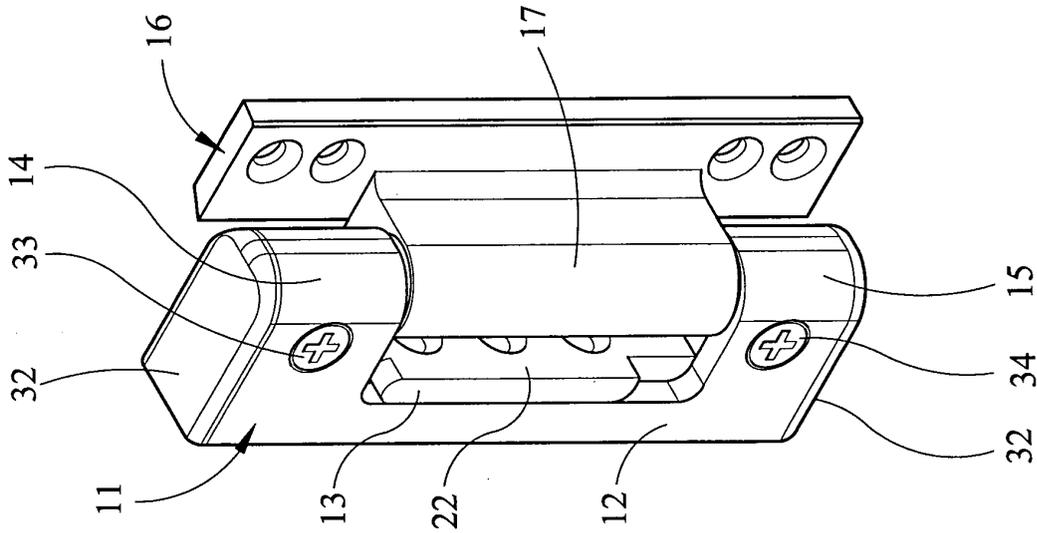


FIG 2

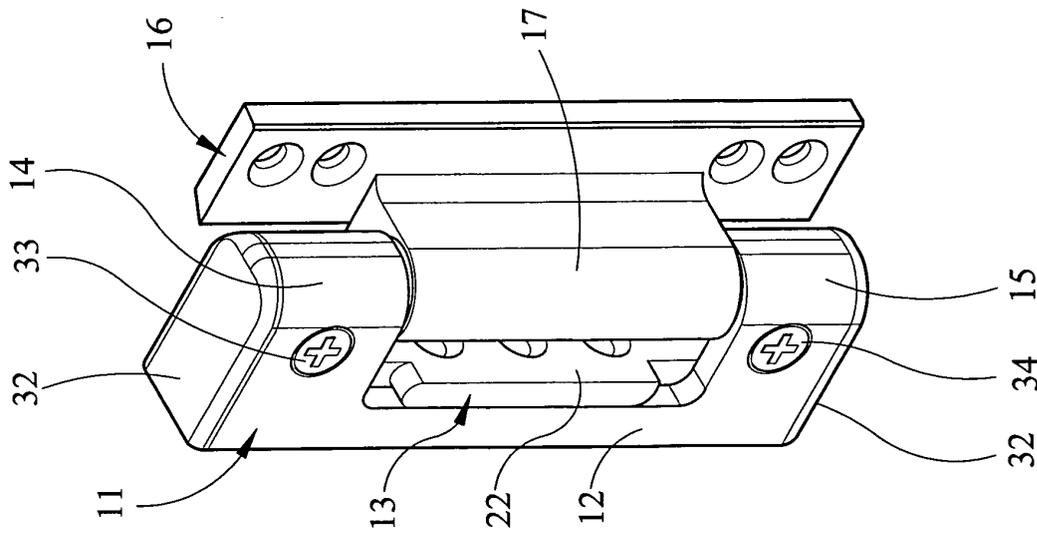


FIG 3

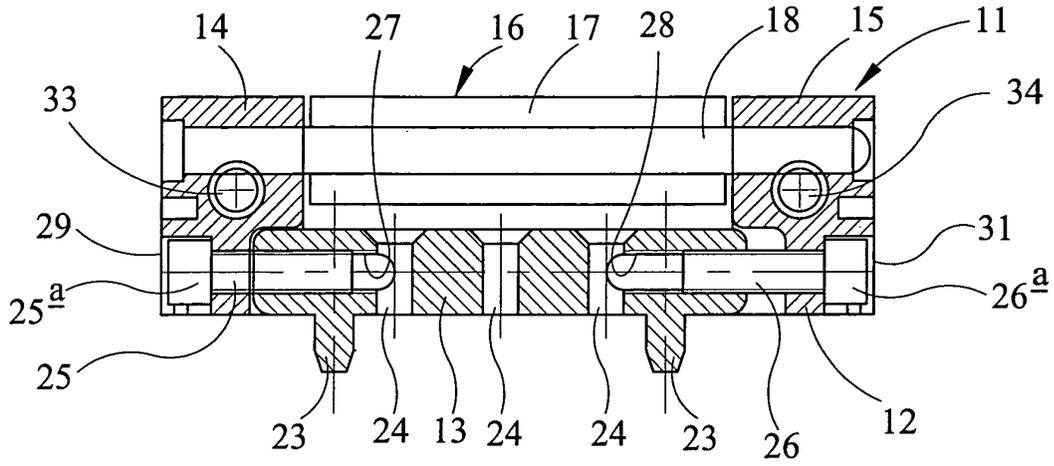


FIG 5

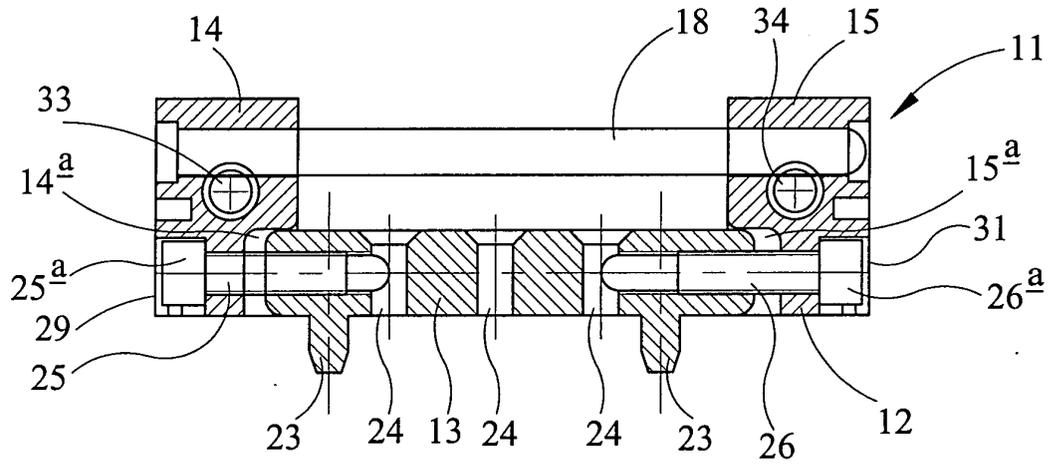


FIG 4

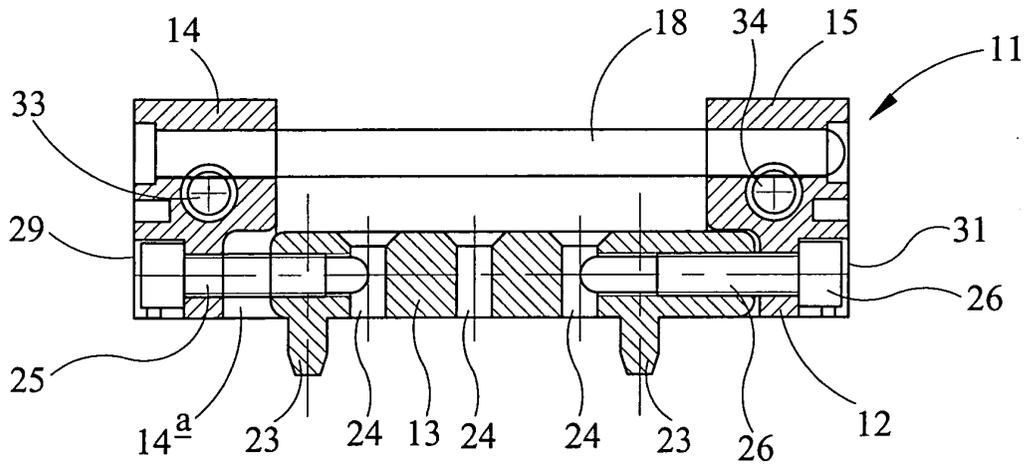


FIG 6

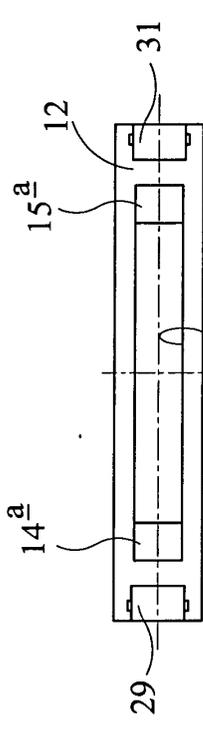


FIG 7

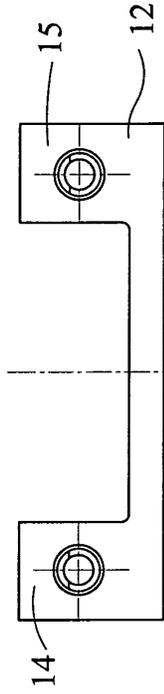


FIG 8

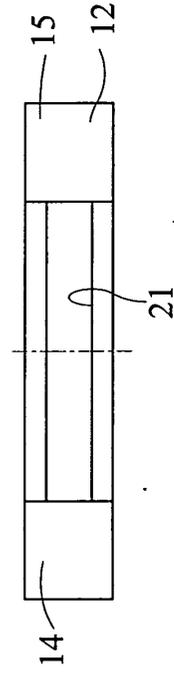


FIG 9

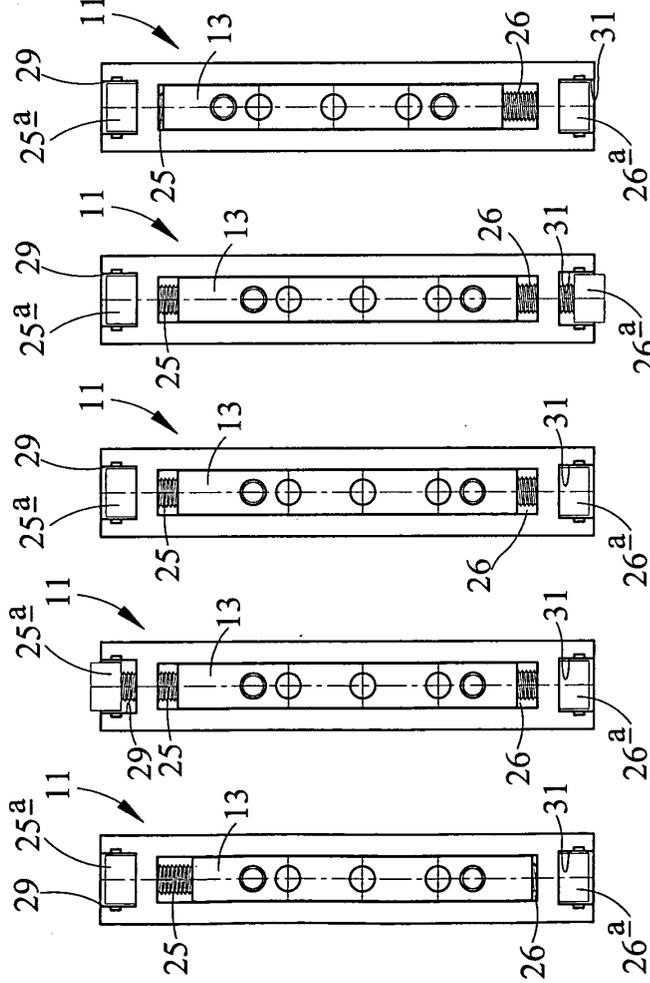


FIG 10

FIG 11

FIG 12

FIG 13

FIG 14

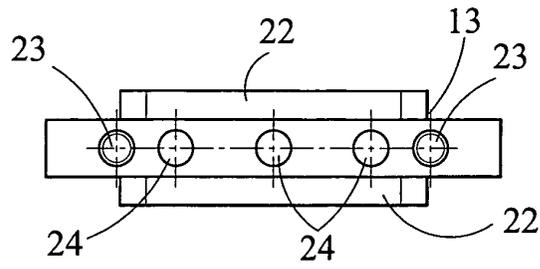


FIG 15

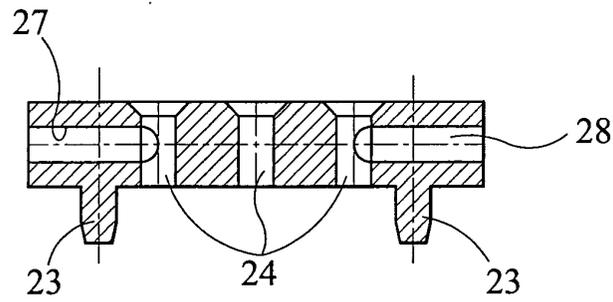


FIG 16

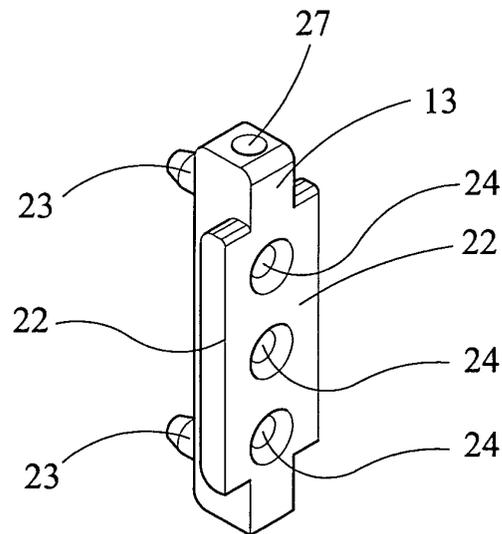


FIG 17