



European Patent Office



(11)

EP 0 735 222 A1

(12)

EUROPEAN PATENT APPLICATION

(51) Int. Cl.⁶: **E05D 5/02**, E05D 7/00,
E05D 7/04, E05D 7/10

(21) Application number: 96302163.9

(22) Date of filing: 28.03.1996

(72) Inventor: Wallis, Glen,
c/o Brunel Comp. Ltd.
Daventry, Northants NN11 5RD (GB)

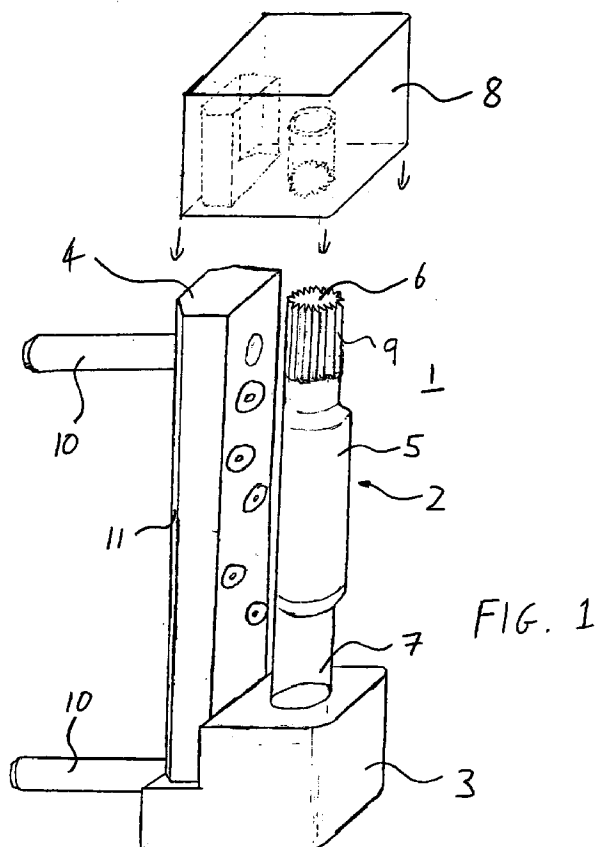
(30) Priority: 30.03.1995 GB 9506540

(71) Applicant: **BRUNEL COMPONENTS LIMITED**
Daventry, Northants NN11 5RD (GB)

(74) Representative: **Leeming, John Gerard et al**
J.A. Kemp & Co.,
14 South Square,
Gray's Inn
London WC1R 5LX (GB)

(54) Hinge

(57) The invention relates to a kind of hinge for providing adjustment of the position of the door relative to the frame whilst the door is in position and supported by the hinge. The hinge comprises a frame attachment means (3,4) for attachment to a door frame, a door attachment means (61) and a spindle (2) attached to the frame attachment means (3,4). The spindle (2) includes an axially eccentric central portion (5) to which the door attachment means (61) is rotatably mounted and also a means (9,81) for preventing rotation of the spindle when it is attached to the frame attachment means.



EP 0 735 222 A1

Description

The present invention relates to hinges for doors, windows, gates or the like.

For conciseness and clarity, the term "door" used herein is intended to embrace any hinged member, including windows, gates, hatches, doors, etc.

Traditionally there have always been difficulties associated with the hanging of doors, gates etc. on their hinges such that they sit correctly in their frame. This often involved mounting the door and hinge and then removing it to make adjustments to position of the fasteners and so on.

It is therefore desired to provide a hinge which allows the installer to hang the door and carry out positional adjustments while the door is in place. This allows the installer to make adjustments and to immediately see the effect without having to repeatedly hang and remove the door from the hinge.

Therefore according to the present invention there is provided a hinge comprising frame attachment means for attachment to a door frame; door attachment means; a spindle attached to the frame attachment means, said spindle including an axially eccentric central portion to which the door attachment means is rotatably mounted; and means for selectively preventing rotation of said spindle relative to said frame attachment means.

The frame attachment means may be provided in two halves with a spindle supporting portion and a fixing portion, such that the spindle supporting portion is slidably attached to the fixing portion. An adjusting means may be provided to slidably adjust the relative position of the spindle supporting portion relative to the fixing portion. This allows fine adjustment of the mounting height of the door.

The adjusting means may be provided by screwing a bolt into the fixing portion through a hole in the spindle supporting portion, with the spindle supporting portion resting on the head of the bolt such that as the bolt is screwed into the fixing portion, the head of the bolt moves towards the fixing portion carrying the spindle supporting portion with it.

The hinge may include a second spindle supporting means which is slidably attached to the fixing portion and which engages the top of the spindle.

The means for preventing the rotation of the spindle may comprise providing splines on the end of the spindle which engages with one of the spindle supporting means to prevent rotation of the spindle. The splined portion is preferably provided on the upper end of the spindle and in the second spindle supporting portion. This means that, with the second spindle supporting portion removed, the spindle can rotate in the first spindle supporting portion whilst supporting the weight of the door. When the spindle is in the desired position, the second spindle support portion can be moved into position to lock the spindle in position.

The fixing portion is preferably rectangular in shape having angled edges to form a "dove-tail" shape. The shape of the spindle supporting portions can be matched by providing them with a corresponding shape, i.e. by having two arms with protruding portions on the end which hook around the edge of the fixing portion at the angled edges thereon. The fixing portion may, however have a variety of shapes. For example by providing one or more ribs or grooves along the sides.

A further adjustment may be provided on the door attachment means to allow adjustment of the length between the door connection part and the spindle connection part, to provide further positional adjustment of the door.

An embodiment of a hinge according to the present invention will now be described with reference to the following drawings in which like reference numerals refer to like parts:

Figure 1 shows a disassembled view of the hinge according an embodiment of the present invention.

Figure 2 shows a top view of the spindle supporting portion.

Figure 3 shows a bottom view of the spindle supporting portion.

Figure 4 shows a view of the hinge with the spindle and second spindle supporting portion removed, looking from the door side of the hinge.

Figure 5 shows a side view of the hinge with the spindle and second spindle supporting portion removed.

Figure 6 shows the door attachment portion.

Figure 7 shows a sectional view through the hinge with the door attachment portion in position.

Figure 8 shows a bottom view of the second spindle support portion.

The hinge 1 includes a frame attachment part 3,4 which comprises a spindle supporting portion 3 and a fixing portion 4, which is substantially rectangular though the sides which face the wall, in use, have angled edges 11 to provide a "dove-tail" shape. The angled edges are provided for engaging correspondingly shaped protrusions 21 on two spindle supporting portions 3,8 which are attached to the top and bottom of the fixing portion. The fixing portion 4 also has two protruding shafts 10 which are inserted into holes provided in the frame which, along with screws passed through screw holes 40 also provided in the fixing portion, serve to provide load bearing support for the hinge.

Once the fixing portion is located on the frame and screwed into position, the lower spindle supporting por-

tion is attached to it. This is achieved by sliding the lower spindle supporting portion 3 onto the bottom of the fixing portion 4, then screwing a retaining bolt 30 into the bottom of the fixing portion through a hole 31 provided in the bottom of the lower spindle supporting portion. Once the retaining bolt has engaged the fixing portion, the head of the bolt will support the lower spindle supporting portion.

A door mounting part 61, which is pivotally mounted on a spindle 2, is attached to the door or gate which is to be hung. The spindle comprises two co-axial end sections 6,7 and an eccentric central portion 5 having its axis offset from the two end sections. The upper end of the spindle is provided with a series of splines 9 for engaging corresponding splines 81 provided in the upper spindle supporting portion 8, described below. The door mounting part is attached to the spindle, so that it pivots on the eccentric portion.

The door (not shown), with the door mounting part and spindle attached, is lowered into its mounting position so that the lower end of the spindle 7 drops into a recess 20 in the upper surface of the lower spindle supporting portion. The weight of the door is then supported by the spindle which is supported by the lower spindle supporting portion.

In this position, with the door supported, the installer can carry out fine tuning of the positioning of the door.

Firstly, the retaining bolt 30 located at the bottom of the lower spindle supporting portion can be turned to provide height adjustment. By screwing the retaining bolt further into the fixing portion, the lower spindle supporting portion is raised which in turn raises the spindle and consequently the door. To protect and hide the head of the retaining bolt, a recess 32 is provided on the base of the lower spindle supporting portion in which the head of the retaining bolt 30 is located.

In order to provide adjustment of the position of the door in and out of the frame (i.e. to the left and right in figure 5), the spindle is rotated in the receiving hole 20 in the lower spindle supporting portion. As the spindle is rotated, the eccentric central portion 5, to which the door is indirectly attached, rotates causing its axis to move in a circular orbit around the axis of the end portion of the spindle. This allows the door to be moved in and out of the frame.

Once the desired position has been obtained the upper spindle supporting portion is slid into place. The upper spindle supporting portion, like the lower spindle supporting portion, has a "dove-tail" engaging portion 82 to allow it to slide down the fixing portion from the top. The upper spindle supporting portion is provided with a splined receiving hole 81 which engages the upper splined section of the spindle. This engagement locks the spindle, preventing any further undesirable rotation of the spindle.

A further adjustment may be provided to allow left/right adjustment of position of the door. This is provided by providing a screw adjustment 60 to allow the

part of the door attachment part connected to the door to move relative to the part attached to the spindle.

Alternatively, instead of the arrangement of splines on the spindle and upper spindle supporting portion, other means may be provided to selectively lock the spindle against rotation in the frame attachment portion. For example a grub screw could be provided in the upper spindle supporting portion which is screwed against the edge of the spindle in a smooth recess which replaces the splined recess 81. This grub screw when screwed into the upper spindle supporting portion would lock the spindle.

Claims

1. A hinge comprising:
 - frame attachment means for attachment to a door frame;
 - door attachment means;
 - a spindle attached to the frame attachment means, said spindle including an axially eccentric central portion to which the door attachment means is rotatably mounted; and
 - means for selectively preventing rotation of said spindle relative to said frame attachment means.
2. A hinge according to claim 1 wherein the frame attachment means comprises a fixing portion and a spindle supporting portion slidably attachable to each other, the spindle supporting portion being restrained from moving downwards by a retaining means.
3. A hinge according to claim 2 further comprising a second spindle supporting portion slidably engageable with the fixing portion and for attaching to a second end of said spindle.
4. A hinge according to claim 3 wherein the means for selectively preventing rotation of said spindle includes a set of splines on the second end of said spindle which slidably engage with the second spindle supporting portion to prevent the spindle rotating.
5. A hinge according to any one of claims 2 to 4 wherein the retaining means is provided by screwing an adjustment bolt into the fixing portion through a hole in the spindle supporting portion.
6. A hinge according to any one of claims 2 to 5 wherein the fixing portion is substantially rectangular in cross-section, having two angled corners which, in use, face the frame.
7. A hinge according to claim 6 wherein the spindle supporting portion is provided with two arms, each having protruding portions on each end which

define a space corresponding to the shape of the fixing portion and into which the fixing portion is slidable.

8. A hinge according to any one of claims 2 to 5 5
wherein the fixing portion is substantially rectangular in cross-section, having one or more grooves or ribs on each side.
9. A hinge according to claim 8 wherein the spindle 10
supporting portion is provided with two arms, each having protruding or recessed portions to respectively engage said one or more grooves or ribs on said fixing portion.
- 15
10. A hinge according to any one of claims 2 to 9
wherein the spindle engages a recess on the spindle supporting means.
11. A hinge according to any one of the preceding 20
claims wherein the door attachment means includes adjustment means to allow movement of the portion attached to the door relative to the portion rotatably mounted to the spindle.
- 25
12. A hinge according to any one of the preceding
claims wherein said frame attachment means includes two protruding shafts to provide load bearing support to said hinge.
- 30

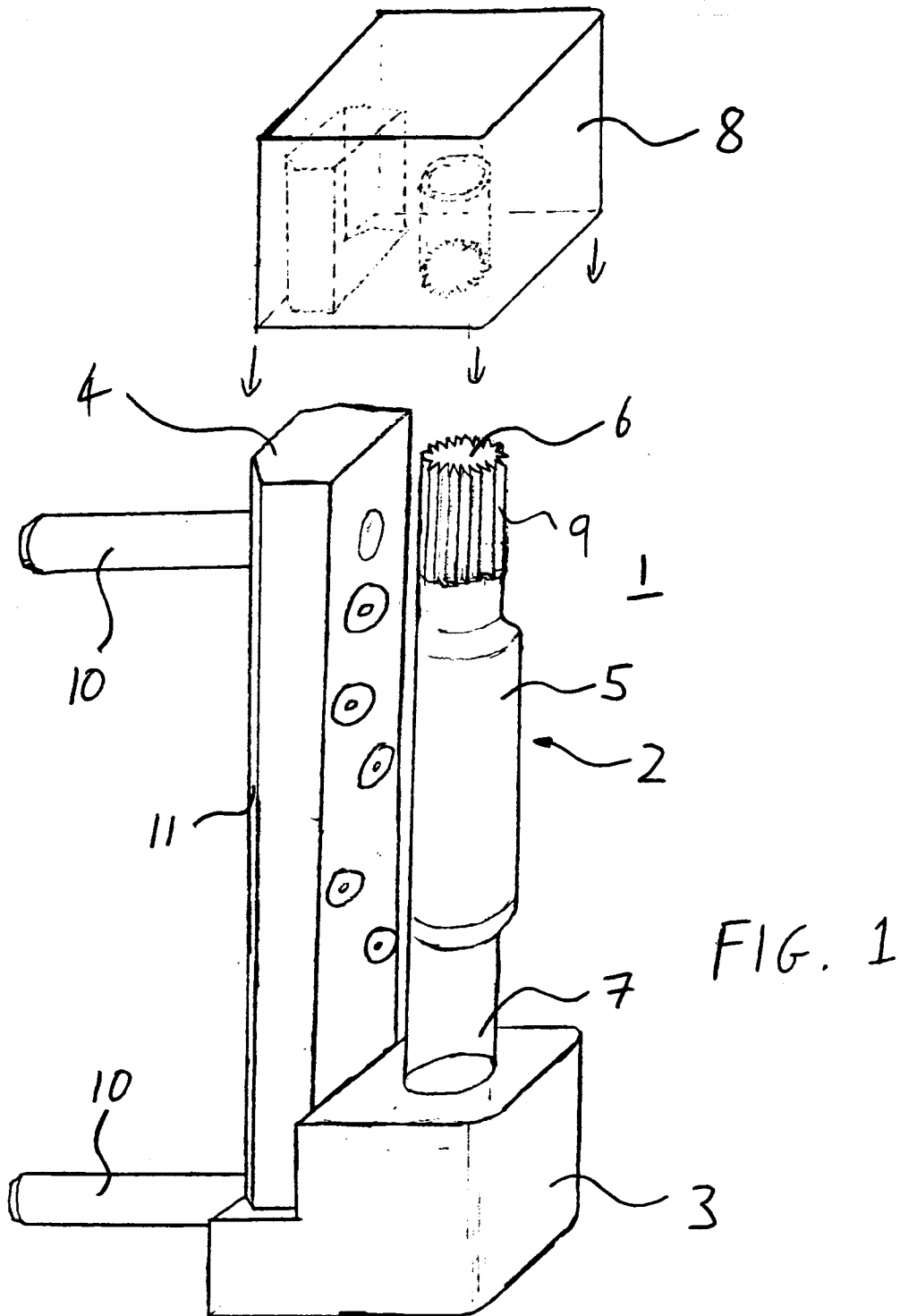
35

40

45

50

55



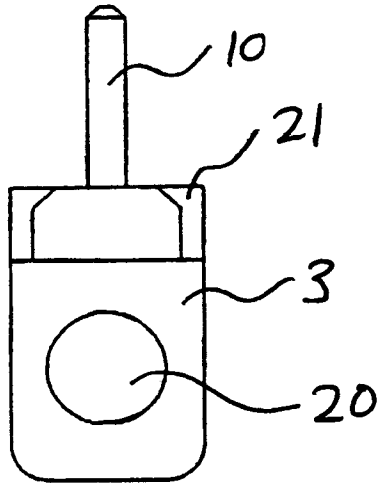


FIG. 2

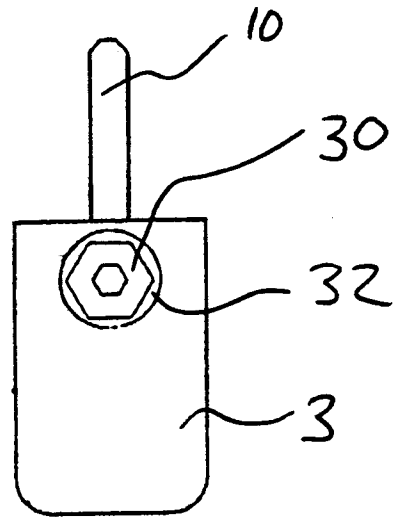


FIG. 3

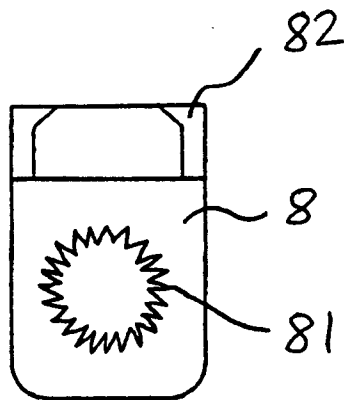


FIG. 8

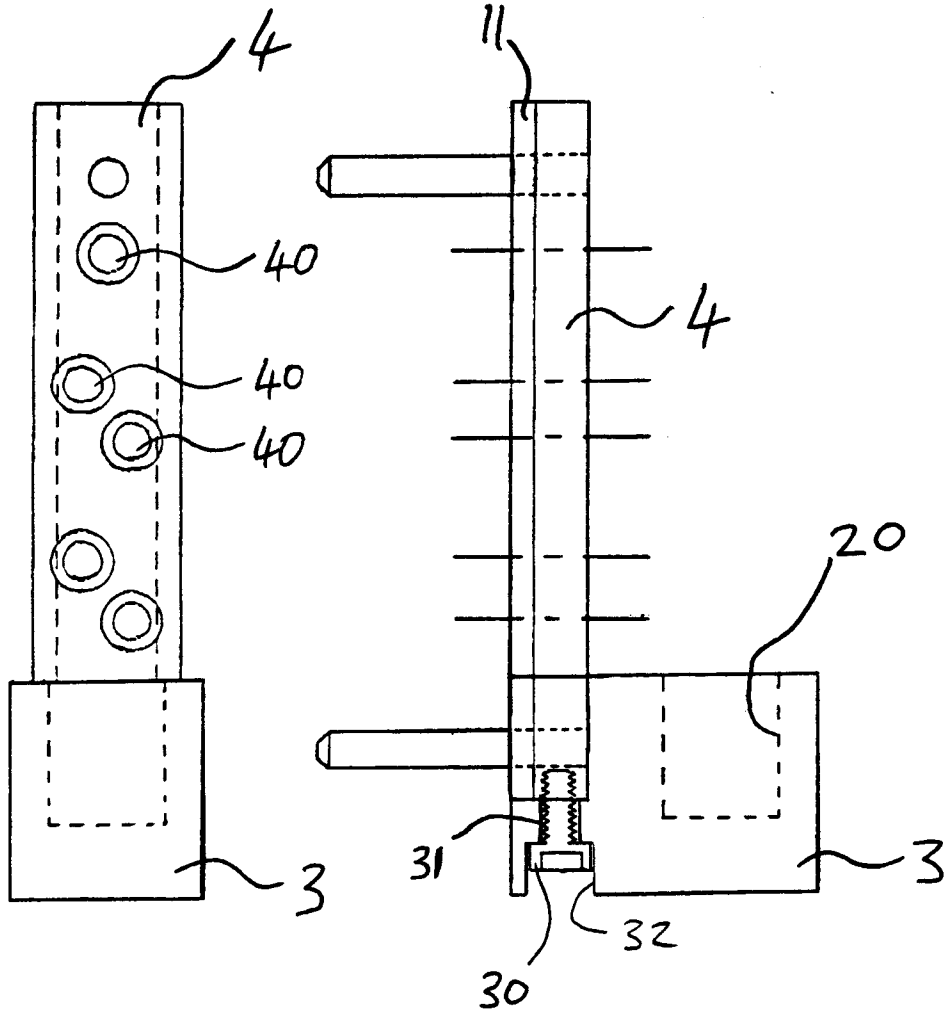


FIG. 4

FIG. 5

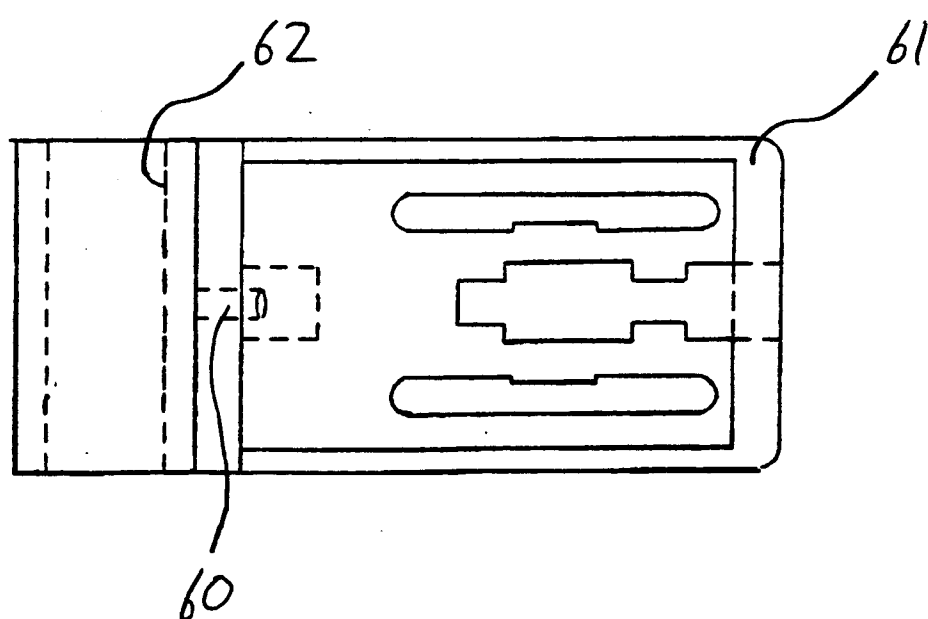


FIG. 6

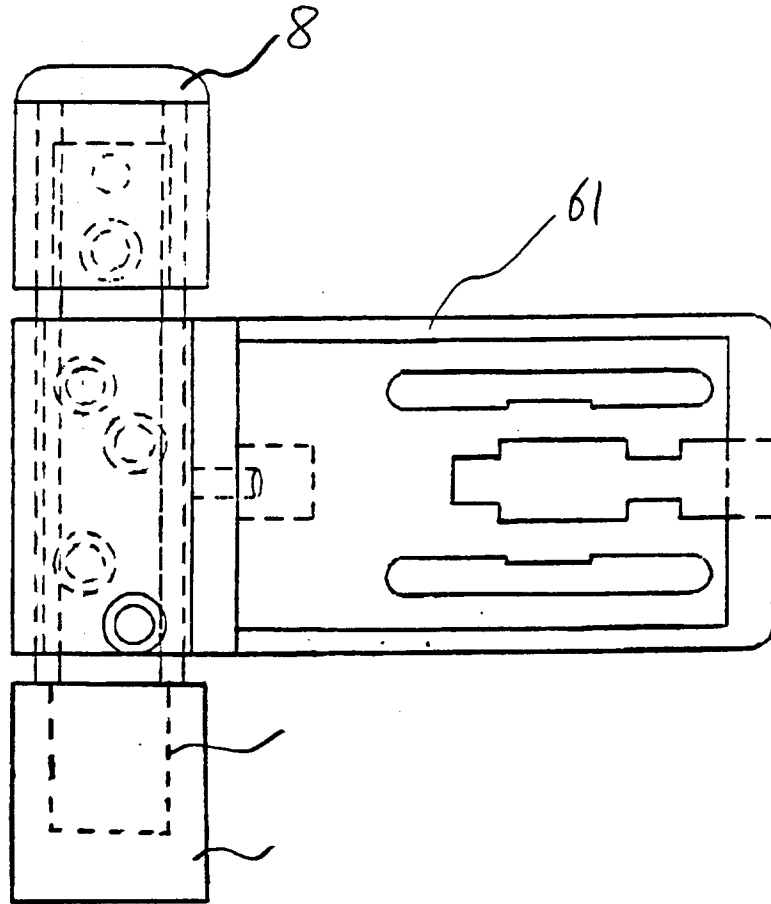


FIG. 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 30 2163

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	DE-A-25 15 335 (HASP) * page 3 - page 4; figures * ---	1-5,10	E05D5/02 E05D7/00 E05D7/04 E05D7/10
Y	GB-A-2 253 242 (GIBBONS OF WILLENHALL) * page 4, paragraph 7 - page 5, paragraph 5; figure 2 * ---	1-5,10	
Y	DE-A-37 05 131 (HAHN) * column 3 - column 4, line 30; figure 1 * ---	1-4,8-11	
Y	DE-U-92 03 856 (SCHARWÄCHTER) * page 10, line 25 - line 33; figure 4 * ---	1-4,8-11	
Y	EP-A-0 569 818 (HAHN) * column 2, line 51 - column 3, line 34 * * column 3, line 52 - line 56; figures * ---	1,12	
Y	DE-U-92 18 045 (EMKA) * page 5, last paragraph - page 6, paragraph 1; figures * -----	1,12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E05D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		10 July 1996	Van Kessel, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)