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**E1J JCG**

(56) Documents Cited

**WO 2001/057350 A FR 002799226 A**

(58) Field of Search

UK CL (Edition T ) **E1J JCG JDG**

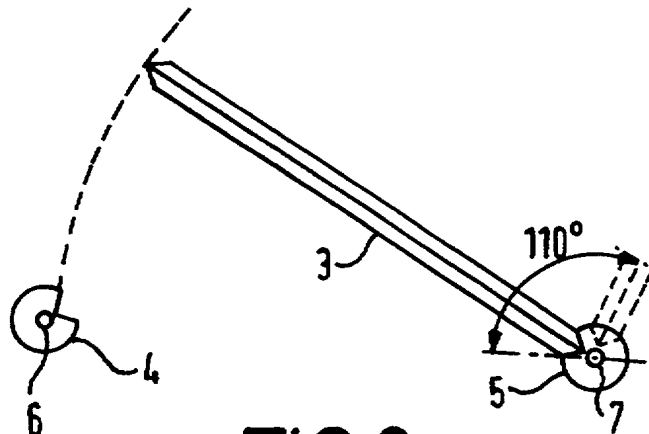
INT CL<sup>7</sup> **E05F 15/12, E06B 3/34 3/36 11/02 11/04**

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(54) Abstract Title

**Door joined to a rotatable door post**

(57) A door assembly includes a door post 5 which is rotatable about a longitudinal axis 7 and is formed with a recess shaped to receive the side edge of a door 3. The door assembly may include a frame comprising a head rail between the door supporting door post 5 and a slam door post 4 and a means of enabling rotation of each door post relative to the head rail about a longitudinal axis. The means of rotation may be supporting the ends of the door posts within bearing races, or the end of each door post may carry a spindle which seats within a suitably shaped cap secured to the head rail. The door posts may be circular in cross-section and the depth of the recesses on the doorposts may be less than the circumference of the door posts. Preferably the shape of the recess complements the shape of the door edge, the recess may be "V" shaped.



**FIG.2.**

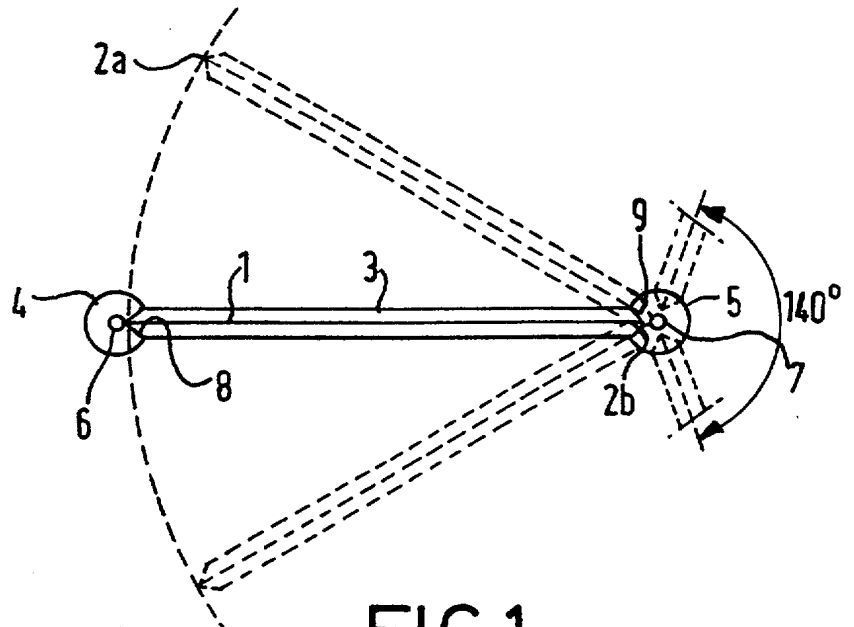


FIG.1.

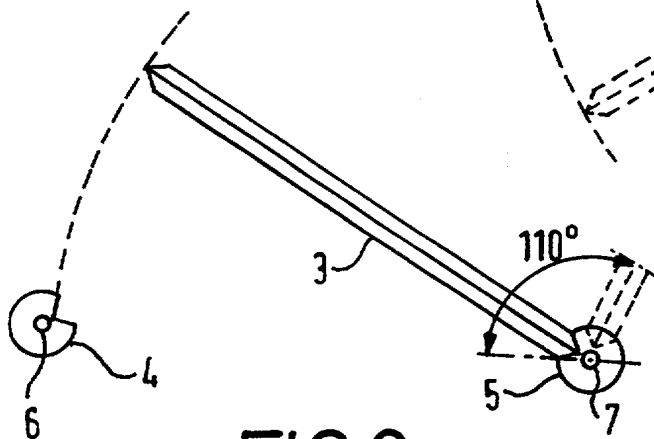


FIG.2.

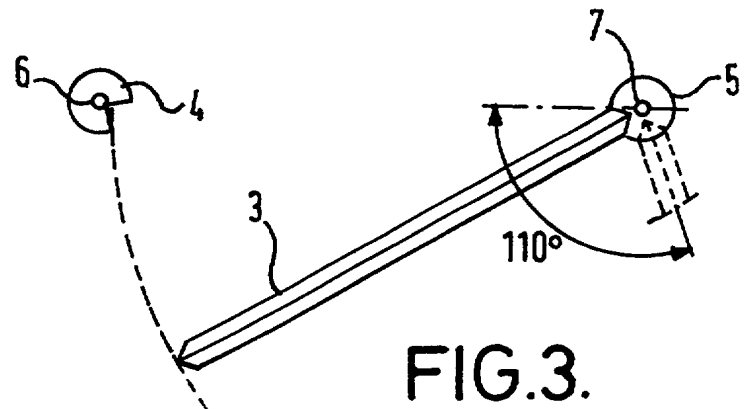


FIG.3.

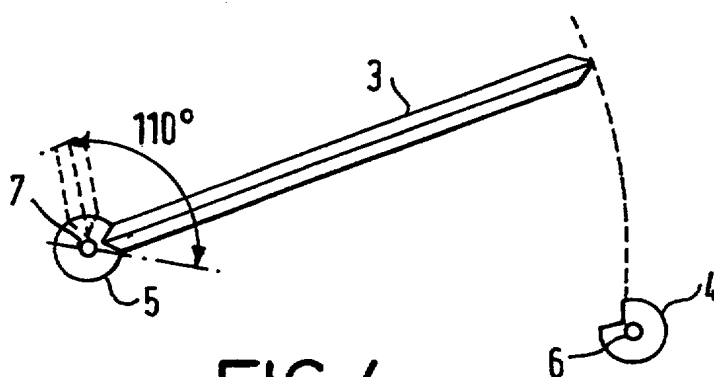


FIG.4.

## DOORPOSTS AND DOORFRAMES

This invention relates to doorposts and assemblies of doors and doorframes.

Conventionally a frame for a door comprises two upstanding fixed doorposts connected through a fixed headrail. A door is then connected by hinges to one doorpost and rotatable about the spindles of these hinges to move the door between open and closed positions. Conventional doors normally carry handles and possibly locks located to one side of the door which co-operate with suitably positioned catchments carried by the doorpost opposite to that to which the hinges are secured. The positions of the hinges, handle and/or lock determines whether a door is left or right handed.

The fitting of hinges requires careful attention and can often be troublesome. They are also invariably unsightly. In cases where self or delayed closing of a door is desired, a door closure typically including an overhead hydraulic mechanism or chain operated contraption is required, these being invariably difficult to instal, bulky and unsightly.

The present invention provides an entirely new assembly of a doorpost and an assembly of a door and doorframe through which handles, locks, catchments, exposed hinges and the like are no longer required, and which provides greater security.

According to the present invention in one aspect, there is provided an assembly of a door and an upstanding doorpost, the doorpost being rotatable about a longitudinal axis and formed with a lengthwise extending recess shaped to receive an upstanding longitudinal side edge of the door.

In another aspect, the invention provides an assembly of a door and door frame, the door frame comprising a headrail positioned between a door supporting doorpost and a slam doorpost, means for enabling rotation of each doorpost relative to the headrail about a longitudinal axis, a lengthwise extending open-sided recess formed in the door supporting

doorpost into which one upstanding edge of the door is received and through which the door is secured to the door supporting doorpost, a lengthwise extending open-sided recess formed in the slam doorpost into which the other upstanding side edge of the door can enter.

The depth of each recess is preferably less than the distance between the longitudinal axis about which the respective doorpost rotates and the circumference of that doorpost.

The or each door post may be substantially circular in cross-section and may rotate about its central longitudinal axis. Other doorpost cross-sections may, however, be employed these including, for example, square, rectangular or star-shaped. The cross-section may or need not be symmetrical about a vertical plane passing through the central longitudinal axis of the doorpost.

The shape of the recess will generally complement the cross-section of the respectively upstanding edge section of the door and may, for example, be curvilinear, square, rectangular or "V" shaped. The or each doorpost may be produced from a plastics material, a metal (e.g. aluminium), a plastics coated metal, wood or indeed any material having the required physical properties.

The ends of the or each doorpost may be supported within bearing races, one being floor mounted and the other depending from the headrail of the frame in which the door is located. Alternatively, each end of the or each doorpost may carry a spindle which seats within a suitably shaped cap, one such cap being floor mounted and the other depending from the doorframe headrail, or *vice-versa*.

The invention will now be described by way of example only with reference to the accompanying diagrammatic drawings in which:-

Figure 1 illustrates in plan view an assembly in accordance with the invention providing a two way opening door;

Figure 2 illustrates in plan view the assembly of Figure 1 providing a single way opening door;

Figure 3 shows in plan view the assembly of Figure 2 but with the door opening in a sense opposite to that shown in Figure 2; and

Figure 4 shows in plan view the door assembly of Figure 1 in which the door is oppositely handed to that shown in Figure 1.

It will be understood that the assemblies illustrated in the drawings are schematic and only illustrate, in plan view, doors and co-operating door posts of the assemblies. As is conventional, each door will move below a fixed headrail and comprises front and rear generally rectangular facings secured to and spaced apart by a core material which defines upper, lower and side edges of the door. In the drawings, the upper door edge is indicated by reference numeral 1 and the door edges by reference numerals 2a, 2b.

As shown, the upper door edge 1 and the upstanding door side edges 2a, 2b, are generally "V" shaped, the doors corresponding to those described and illustrated in our co-pending patent application 0129320.8. The advantages of these doors are discussed in our earlier application and although the shaping is preferred in the context of this application other door edge shapes may be employed. Thus, the door edges may be flat, angled or curvilinear.

The assembly illustrated in Figure 1 comprises a door 3, a slam door post 4 and a door supporting doorpost 5. Each doorpost is rotatable about a central axis 6, 7 respectively and includes a "V" shaped recess 8, 9 respectively which extends from the doorpost circumference to a position close to the respective central longitudinal axis 6, 7. The shaping of each recess complements that of the door edges 2a, 2b.

As will be seen from Figure 1, the right-hand side edge 2b of the door extends into the recess 9 and is secured to the supporting doorpost 5 with the edge 2b firmly located within the recess 9. Thus, in use, the door 3 and the doorpost 5 move as a single item.

The door may be secured to the doorpost by screws, adhesives or any conventional means. Typically, the doorpost is of tubular construction with screw fixings passing through suitably positioned aligned holes in the doorpost wall and into the door side edge. Typically, the upper and lower ends of the doorpost 5 are received within bearing cups, one being ground mounted and the other depending from the headrail of the doorframe. Alternative ways of supporting the doorpost for rotation relative to the headrail may be employed. For example, the doorpost may carry at its upper and lower ends sleeves which locate over spindles upstanding from a floor engaging member and downwardly extending from one end of the headrail (not shown). Alternatively, each end of the doorpost may include a spindle which co-operates with a ground mounted and headrail depending bearing cap.

The construction and method of mounting of the slam doorpost 4 duplicates that of doorpost 5..

The side surfaces of the recess 8 of the slam doorpost 4 define abutment surfaces which are engaged by the upstanding door edge 2a as the door 3 is closed. Thus, as the door moves to its closed position, the door edge 2a moves into the recess 8, engages one side face of the recess thereby to impart rotation to the slam doorpost 4.

The extent to which the doorposts 4, 5 can rotate shown in broken line in Figure 1 and is determined by suitably positioned stops (not shown). In Figure 1, these stops are sited to provide a maximum door angular movement of  $140^\circ$ ,  $70^\circ$  to each side of the door's closed position. To accommodate this angular movement, the stops of the doorpost 4 are set to provide a  $70^\circ$  angle of rotation. The rate at which the doorposts 4, 5 can rotate can also be determined by frictionally or otherwise controlling the freedom of relative movement of the rotating and fixed parts of the hinge mechanisms.

In the embodiment illustrated in Figure 2, the door 3 is assembled so that it can only open one way. In this embodiment, the permitted angle of rotation of the doorpost is  $110^\circ$  and that of the doorpost 4 is  $35^\circ$ . This operational change is achieved simply by controlling the permitted arcuate movements of the doorposts 4, 5.

Thus, the slam doorpost is stopped to prevent movement in a sense which will permit the door to move to the lower position shown in dotted line in Figure 1.

Figure 3 shows the door of Figures 1 and 2 assembled to open in the opposite sense to that of Figure 2. This is achieved again simply by changing the stop positions of the doorpost 4.

In Figure 4, the door is assembled so that it is oppositely handed to those of Figures 1 to 3. This is achieved simply by swapping over the position of the slam and door supporting doorposts.

From the foregoing, it will be appreciated that all of the illustrated embodiments can be achieved using precisely the same door and doorpost set, the variations in opening being achieved simply by changing the stop positions of one or both doorposts, or by swapping over the doorposts from their original positions. Locking of the door can readily be achieved by mechanically, magnetically or electronically preventing relative movement of the slam post 4 when the door edge 2a is located within the recess 8. Other locking devices can, of course, be employed. Similarly, a mechanically, electrically or electromagnetically operated delayed door closure facility can be provided within the slam doorpost 4.

Advantages of doorposts and assemblies in accordance with this invention include the ability to have full height locking of the door through locking of the rotatable slam post 4; elimination of conventional external hinges, locks and door furniture; and a totally enclosed integrated door opening and/or closure mechanism.

It will be appreciated that the foregoing is merely exemplary of assemblies in accordance with the invention and that various modifications can readily be made thereto without departing from the invention described. Thus, the shaping of the recesses 8, 9 and the door edges 2a, 2b may differ from those illustrated and described. Also, a wide variety of hinging mechanisms may be adopted to impart rotational movement to the doorposts 4, 5.

CLAIMS

1. An assembly of a door and an upstanding doorpost, the doorpost being rotatable about a longitudinal axis and formed with a lengthwise extending recess shaped to receive an upstanding longitudinal side edge of the door.
2. An assembly of a door and door frame, the door frame comprising a headrail positioned between a door supporting doorpost and a slam doorpost, means for enabling rotation of each doorpost relative to the headrail about a longitudinal axis, a lengthwise extending open-sided recess formed in the door supporting doorpost into which one upstanding edge of the door is received and through which the door is secured to the door supporting doorpost, a lengthwise extending open-sided recess formed in the slam doorpost into which the other upstanding side edge of the door can enter.
3. An assembly as claimed in claim 2 wherein the depth of each recess is less than the distance between the longitudinal axis about which the respective doorpost rotates and the circumference of that doorpost.
4. An assembly as claimed in any one of the preceding claims wherein the or each doorpost is substantially circular in cross-section and is rotatable about its central longitudinal axis.
5. An assembly as claimed in any one of the preceding claims wherein, in cross-section, the or each doorpost is symmetrical about a vertical plane passing through the central longitudinal axis of the doorpost.
6. An assembly as claimed in any one of the preceding claims wherein the shape of the recess complements the cross-section of the respectively upstanding edge section of the door.
7. An assembly as claimed in any one of the preceding claims wherein the recess is "V" shaped.



8. An assembly as claimed in any one of the preceding claims wherein the ends of the or each doorpost are supported within bearing races, one being floor mounted and the other depending from the headrail of the frame in which the door is located.
9. An assembly as claimed in any one of claims 1 to 7 wherein each end of the or each doorpost carries a spindle which seats within a suitably shaped cap, one such cap being floor mounted and the other depending from the doorframe headrail, or *vice-versa*.
10. An assembly substantially as herein described or as described with reference to the accompanying drawings.



INVESTOR IN PEOPLE

**Application No:** GB 0129952.8  
**Claims searched:** 1-10

**Examiner:** Ben James  
**Date of search:** 22 May 2002

## **Patents Act 1977**

### **Search Report under Section 17**

#### **Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): E1J: JCG, JDG

Int Cl (Ed.7): E05F 15/12

E06B: 3/34, 3/36, 11/02, 11/04

Other: ON-LINE: EPODOC, WPI, JAPIO

#### **Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	FR 2799226 A Dignat Jean	
A	WO 0157350 A SOMMER GMBH	

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| <b>X</b> Document indicating lack of novelty or inventive step   | <b>A</b> Document indicating technological background and/or state of the art.  |
| <b>Y</b> Document indicating lack of inventive step if combined with one or more other documents of same category. | <b>P</b> Document published on or after the declared priority date but before the filing date of this invention.          |
| <b>&amp;</b> Member of the same patent family  | <b>E</b> Patent document published on or after, but with priority date earlier than, the filing date of this application. |