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(11) **EP 1 036 905 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.09.2000 Bulletin 2000/38

(51) Int. Cl.⁷: **E05D 15/52, E05D 7/02**

(21) Application number: **00301453.7**

(22) Date of filing: **24.02.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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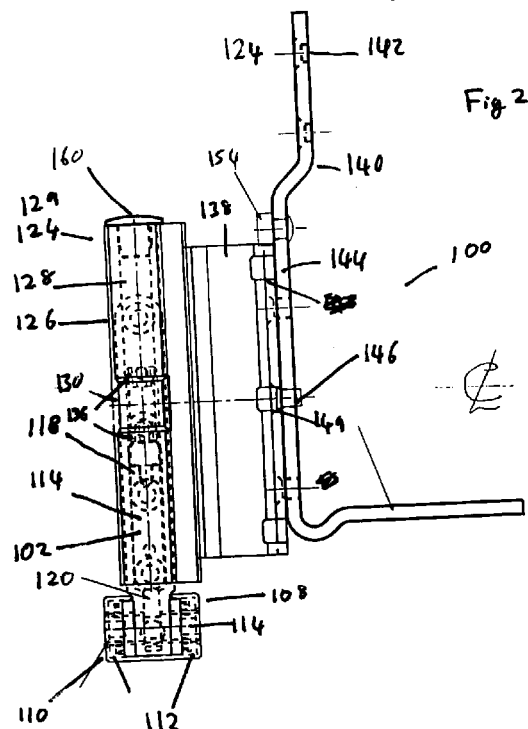
(30) Priority: **18.03.1999 GB 9906196**

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(54) **Unhanded closure hinge**

(57) An unhanded bottom hinge assembly for a closure. It comprises a pin mounted on a pin support by which the pin can be secured to a frame of an opening and a hinge. The hinge has a barrel open at both ends for accepting the pin, a support by which the hinge can be attached to a sash and a pivot attaching the barrel to the support such that the barrel can be rotated through 180° with respect to the support. This allows the bottom hinge assembly to be configured to provide a left or right handed opening sash.



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Description

[0001] The present invention relates to a closure hinge and in particular to an unhandled bottom hinge which can be configured for right handed or left handed opening of a window.

[0002] Closure furniture is a well developed art. Closures, such as windows and doors, can be provided with furniture providing tilt and turn and tilt before turn facilities. Briefly, it is common to provide a three position handle at a side of a sash frame which operates a number of connected mechanisms to engage and disengage furniture by which the closure sash is connected to the frame of an opening. With the sash closed and the handle in a first position, the sash is locked to the frame. With the handle turned into a second position, the sash can be pivoted from the frame about a horizontal axis ('tilt'). With the handle turned into a third position, the sash can be pivoted about a vertical axis ('turn'), to be fully opened. Tilt and Turn and Tilt before Turn sashes differ in the order in which the tilting and turning are provided by the handle position. It will be appreciated that complex furniture mechanisms are required in order to provide such closures.

[0003] The handle is often provided at one side of a closure with hinges providing the turn facility at an opposite side. A handle on the left hand side of a sash provides a sash particularly suitable for operation with the right hand of a user (a right handed closure). A handle on the right hand side of a sash provides a sash particularly suitable for operation with the left hand of a user (a left handed closure).

[0004] Owing to the complexity of previous tilt and turn and tilt before turn mechanisms, it has been necessary to provide different closure furniture depending on whether the closure was to be left or right handed. This has required stocks of both left and right handed furniture to be designed, manufactured, stocked, supplied and provided at installation sites. There can be significant waste of materials, capital and time in over or under manufacturing or stocking a particular handedness of furniture or not having the correct handedness of furniture available when installing a closure at a site.

[0005] According to the present invention there is provided an unhandled bottom hinge assembly for a closure, comprising:

a pin mounted on a pin support by which the pin can be secured to a frame of an opening; and
 a hinge having a barrel open at both ends for accepting the pin, a support by which the hinge can be attached to a sash and a pivot attaching the barrel to the support such that the barrel can be rotated through 180° with respect to the support allowing the bottom hinge assembly to be configured to provide a left or right handed opening sash.

[0006] A bottom hinge for the sash of a closure is

provided with a hinge which has two configurations. The first allows the hinge to be used for a right handed closure and the second configuration for a left handed opening. This is achieved by providing an unhandled hinge with a pin receiving member that can be rotated by 180° to provide the right or left handed configuration. A pin is secured to the frame of an opening by a pin support for a left or right handed opening closure and the sash is hung on the pin by the pin receiving member of the hinge attached to the sash.

[0007] The assembly is unhandled until actually installed. Hence only a single hinge needs to be manufactured, stocked or available at an installation site. Hence there are significant advantages in terms of economy, flexibility and use of an unhandled hinge.

[0008] Preferably, the pin support includes a pivot by which the pin is pivotally attached to the pin support. In this way the hinge allows the sash to tilt out of the plane of the opening frame and so the full tilt and turn and tilt before turn functionality of a sash can be provided.

[0009] Preferably, the barrel is off-set to a side of the support. In this way the relative positions of the sash and frame of an opening can be accommodated.

[0010] Preferably, the support includes a fastener which prevents relative rotation of the barrel and support once the assembly has been configured for a particular opening handedness. The fastener prevents relative rotation of the barrel and support once the hinge has been configured for a particular handedness of closure.

[0011] Preferably, the barrel includes an internal thread and a grub screw, in which the position of the grub screw along the length of the barrel can be adjusted so as to control the depth of insertion of the pin in the barrel. The fit of the sash within the opening frame can be adjusted by altering the depth by which the pin enters the barrel. This can be accomplished by providing a grub screw in a threaded portion of the barrel so that the grub screw can be screwed in or out thereby altering the position of the surface which contacts the end of the pin which supports the sash.

[0012] Preferably, the pin has a nylon bush at a free end to prevent self adjustment of the grub screw. A nylon bush at a free end of the pin within the barrel and on which the grub screw rests helps to prevent the grub screw from being rotated by the opening of the sash thereby preventing unwanted adjustment of the depth of insertion of the pin in the barrel.

[0013] A plastic finishing cap may be fastened to a top exposed end of the barrel. This provides a both a cosmetic finish to the hinge which can be colour coded with the rest of the closure. The cap can also prevent moisture, dirt and other unwanted material from collecting in the barrel via its exposed open end.

[0014] The present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows an end view of a closure hinge assembly according to the invention;

Figure 2 shows a side view of the closure hinge assembly shown in Figure 1;

Figure 3 shows a plan view of the closure hinge assembly shown in Figures 1 and 2;

Figure 4 illustrates the positioning of a pin part of the assembly for left and right handed closures; and
 Figure 5 illustrates the alternative configurations of a hinge part of the assembly for left and right handed closures.

[0015] The same parts in different Figures share common reference numerals.

[0016] With reference to Figures 1 to 3 there are shown end side and plan views of an unhandled bottom hinge assembly, designated generally by reference numeral 100, for a closure according to the present invention. The assembly is shown configured as a left handed hinge. Hidden parts of the assembly are shown in ghost lines.

[0017] The assembly includes a pin 102 which is mounted on a pin support 104. The pin support includes a number of holes 106 for accepting screws by which the pin support can be secured to the frame of an opening. A bottom end of the pin support 108 includes a pivot 110 by which the pin 102 is pivotally attached to the pin support. The pivot includes a wall 112 at either side. A threaded aperture 113 is provided in each wall through which a threaded axle 114 passes. The threaded axle has a middle part with no thread having a lesser diameter than the threaded parts of the axle.

[0018] The pin 102 has a main body 114 in the form of a substantially right circular cylinder. A nylon bushing 116 is provided fastened to a free end 118 of the pin. The other end of the pin 120 has a pair of arms 122 which partially encircle the axle 114 around its middle section. In this way the pin is fastened to the pin support and can pivot about the axle. As the middle part of the axle has a reduced diameter, the pin is constrained so as not to slide along the axle. The position of the pin relative to the pin support can be adjusted in the direction along the length of the axle, by rotating the axle 114 so that the screw threads causes the axle to move and the pin with it.

[0019] The assembly 100 also includes a hinge 124. The hinge includes a barrel 126. The barrel is in the form of a right circular cylinder. The barrel includes a pair of cavities 128 which are each open at an end 129. The shape of each cavity substantially matches the shape of the pin such that the pin and cavity are snugly fitting when engaged. The barrel also includes a middle part 130 having a reduced diameter and which defines a closed end of each of the cavities.

[0020] The middle part has a threaded aperture 132 passing through it in a direction along the length of the barrel. A grub screw 134 is provided in the threaded aperture. The grub screw is longer than the threaded

aperture and exposed ends of the grub screw can extend proud of the threaded aperture. Each exposed end 136 of the grub screw includes a formation for accepting a tool to drive the grub screw so as to move it along the longitudinal axis of the barrel. The formation could be a slit to accept a flat bladed screw driver, a cross to accept a philips screw driver, a hexagonal formation to accept an alan key or socket or any other suitable formation.

[0021] The hinge also includes a support 140 by which the hinge can be attached to a sash. The support is generally L-shaped and includes recessed holes 142 for accepting a screw to secure the support to a sash. An upright part 144 of the support includes a hole in which a pivot formation 146 is located. The barrel 126 includes a member 138 which extends from the barrel and presents a substantially planar face plate 139 parallel to the upright part of the support. The face plate includes three apertures 148, 149, 150 col-linearly aligned. Each end of the face includes a locating formation in the form of a recess 151, 152. The recesses are also aligned co-linearly with the three apertures. The middle one of the three apertures 149 has the pivot member 146 passing through it to pivotally fasten the barrel to the support.

[0022] A fastener, 154 is also provided. The fastener engages the recess 152 at the end of the face plate to prevent rotation of the barrel with respect to the support. Further fasteners 156 can also be provided extending through hole 148 to further prevent rotation of the barrel.

[0023] A cap 160 of colour coded plastics is also provided to seal an exposed end of the barrel to prevent unwanted material collecting in the cavity of the barrel.

[0024] The barrel and pin are concentric. Their common longitudinal axis defines a longitudinal axis of rotation of the hinge. The co-linear holes define a longitudinal axis of the support. A transverse axis of rotation of the hinge is defined by the line passing through the centre of the middle hole and perpendicular to the plane of the face plate. The transverse axis of rotation of the hinge is substantially orthogonal to the longitudinal axis of rotation of the hinge and parallel to the plane of the sash to be attached to the support. The longitudinal axis of the barrel is off-set to the side of the longitudinal axis of the support and parallel to it. Off-setting the rotational axis of the hinge to the side of the support allows the pin to be secured to the frame of the opening while the sash can be accommodated within the frame.

[0025] The assembly as shown in Figures 1, 2 and 3 has been configured for use with a left handed sash; i.e. as a hinge on the bottom left hand side of the frame so that the handle is positioned to the right hand side of the frame, convenient for left hand ed use.

[0026] Use of the unhandled hinge assembly of the current invention will now be described with reference to Figures 4 and 5. The unhandled bottom hinge assembly can be configured to provide either a left or right handed

bottom hinge for a tilt and turn or tilt before turn closure.

[0027] A left handed bottom hinge can be provided by fastening the pin 102 to the bottom left hand corner 160 of the frame of an opening by the pin support 106 as shown in Figure 4a. The hinge is then configured as shown in Figure 5a with the barrel off-set to one side of the support 144. A fastener 154 is provide to prevent rotation of the barrel about pivot 146. A sash can be attached to the L-shaped support 144 and the sash can be hung in the opening by engaging the pin 102 in the lower cavity 128 of the barrel. The sash is borne by the engagement of the nylon bushing 116 on the free end of the pin and a lower end of the grub screw 134. The sash can be adjusted vertically with respect to the opening by using a tool 170 to rotate the grub screw so as to raise or lower the sash with respect to the frame. The horizontal position of the sash can be adjusted relative to the frame by means of the threaded axle 114 so that the fit of the sash in the frame can be optimized. A colour matched plastics finishing cap 160 is then fastened to the exposed cavity of the barrel to prevent the collection of unwanted material in the top cavity of the barrel.

[0028] A right handed bottom hinge can be provided by a different configuration of the unhandled bottom hinge assembly of the invention as shown in Figures 4b and 5b. The pin part of the assembly is unhandled. The barrel part of the hinge part of the assembly is symmetric about a plane passing though the middle of the barrel and perpendicular to its longitudinal axis of rotation. As the barrel part is pivotally attached to the support, the barrel can be rotated by 180° about the transverse axis of pivot member 146 in either sense. Hence the left handed configuration shown in Figure 5a can be transformed into the right handed configuration shown in Figure 5b by simply rotating the barrel through 180°. A fastener 154 is then used to prevent any further rotation of the barrel and provides a right handed configured hinge as shown in Figure 5b.

[0029] A right handed bottom hinge can be provided by fastening the pin 102 to the bottom right hand corner 164 of the frame of an opening by the pin support 106 as shown in Figure 4b. The hinge is then configured as shown in Figure 5b with the barrel off-set to one side of the support 144. A fastener 154 is provide to prevent rotation of the barrel about pivot 146. A sash can be attached to the L-shaped support 144 and the sash can be hung in the opening by engaging the pin 102 in the lower cavity 128 of the barrel. The sash is borne by the engagement of the nylon bushing 116 on the free end of the pin and a lower end of the grub screw 134. The sash can be adjusted vertically with respect to the opening by using a tool 170 to rotate the grub screw so as to raise or lower the sash with respect to the frame. The horizontal position of the sash can be adjusted relative to the frame by means of the threaded axle 114 so that the fit of the sash in the frame can be optimized. A colour matched plastics finishing cap 160 is then fastened to

the exposed cavity of the barrel to prevent the collection of unwanted material in the top cavity of the barrel. As the hinge is located at the bottom right hand side of the frame the sash handle will typically be provide at the left hand side of the sash for convenient right handed operation. Finally a decorative colour matched plastics cover can be provided over the visibly exposed parts of the hinge so that it matches the sash and frame.

[0030] The barrel is off-set to the opposite side of the support 144 for the different handedness configurations of the hinge assembly. It will be appreciated that the pin and hinge provide the turn degree of freedom and the pivotal mounting of the pin on the pin support provides the tilt degree of freedom for a tilt and turn and tilt before turn sash. The present invention is particularly suited for windows and doors but is not limited to such closures. Colour matched finishing materials can be provided so that the visibly exposed parts of the hinge assembly match the closure.

Claims

1. An unhandled bottom hinge assembly for a closure, comprising:
 - a pin mounted on a pin support by which the pin can be secured to a frame of an opening; and
 - a hinge having a barrel open at both ends for accepting the pin, a support by which the hinge can be attached to a sash and a pivot attaching the barrel to the support such that the barrel can be rotated through 180° with respect to the support allowing the bottom hinge assembly to be configured to provide a left or right handed opening sash.
2. An assembly as claimed in claim 1, in which the barrel is off-set to a side of the support.
3. An assembly as claimed in claim 1, in which the support includes a fastener which prevents relative rotation of the barrel and support once the assembly has been configured for a particular opening handedness.
4. An assembly as claimed in claim 1, in which the barrel includes an internal thread and a grub screw, in which the position of the grub screw along the length of the barrel can be adjusted so as to control the depth of insertion of the pin in the barrel.
5. An assembly as claimed in claim 4, in which the pin has a nylon bush at a free end to prevent self adjustment of the grub screw.
6. An assembly as claimed in claim 1 and including a plastic finishing cap fastened to a top exposed end

of the barrel.

7. An assembly as claimed in claim 1, in which the pin support includes a pivot by which the pin is pivotally attached to the pin support.

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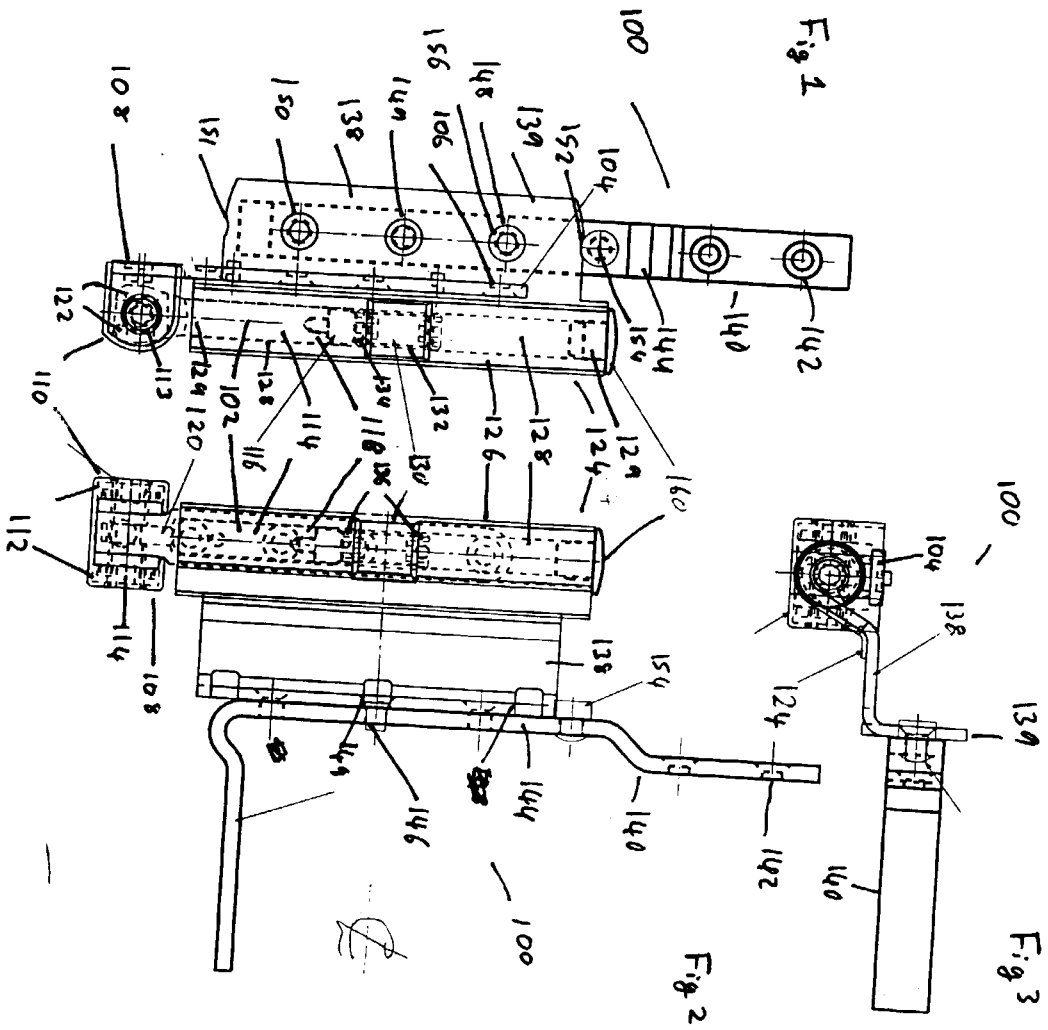


Fig 4

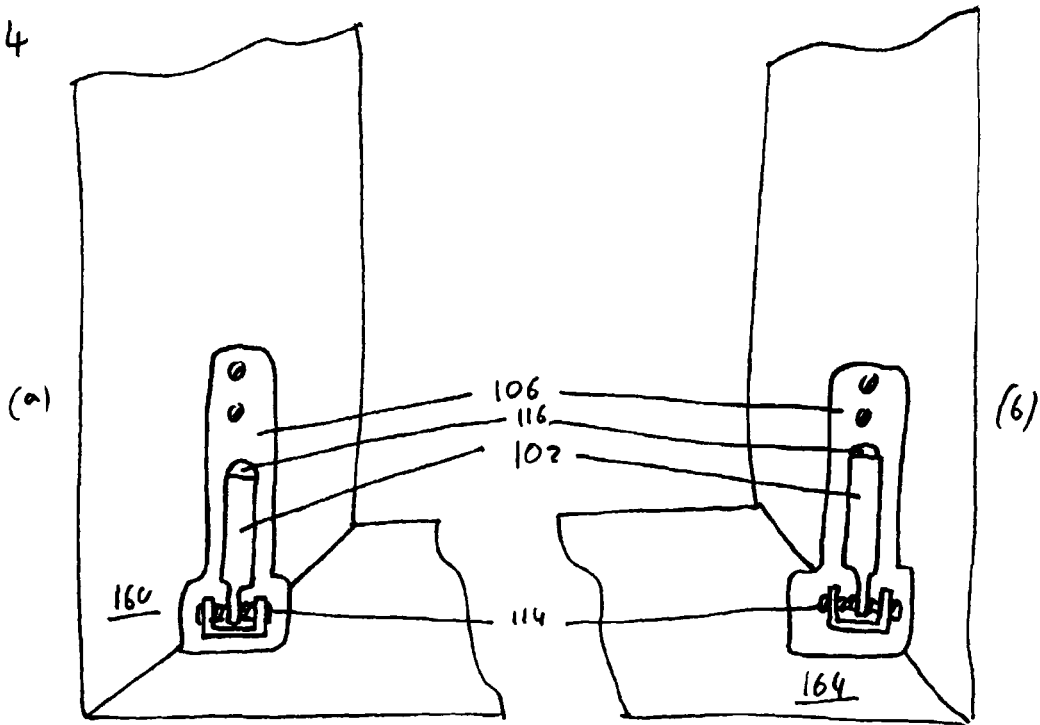


Fig 5

