

PATENT SPECIFICATION

(11)

1 582 667

1 582 667

- (21) Application No. 34998/77 (22) Filed 19 Aug. 1977
(31) Convention Application No. 51/1 132 34U (32) Filed 24 Aug. 1976 in
(33) Japan (JP)
(44) Complete Specification published 14 Jan. 1981
(51) INT. CL.³ E05B 13/10 1/00 // E05C 3/04
(52) Index at acceptance
E2A 106 109 420 LM



(54) SELF-LOCKING DOOR HANDLE ASSEMBLY

(71) We, YOSHIDA KOGYO K.K., a corporation duly organised under the laws of Japan and existing at No. 1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to a self-locking handle assembly associated with a dead bolt mounted in a door for bolting and unbolting the door.

The invention seeks to provide a self-locking door handle assembly associated with a dead bolt, in which the handle is automatically locked in a position where the dead bolt projects out of the door for bolting same, so that the handle cannot be turned to unbolt the door unless first unlocked as by the actuation of a thumbpiece.

25 According to the invention, there is provided a self-locking handle assembly comprising a stationary member adapted to be secured to a door, an actuator member extending through an aperture in the stationary member for actuating a dead bolt on rotational movement of the actuator member about its axis, a handle rigidly connected to the actuator member for manually rotating the actuator member between positions for bolting and unbolting the bolt and a locking member biased into its locking position by resilient means for locking the actuator member and handle in the bolting position and means for releasing the locking member to release the actuator member and handle.

40 Preferably the locking member comprises a lockpin supported by the stationary member for sliding movement toward and away from the handle and resilient means normally biasing the lockpin toward the handles, the handle being adapted to be engaged and locked against movement by the lockpin at least in the bolting position; and wherein the releasing means is actuable manually for disengaging the lockpin from the handle against the bias of the resilient means.

The invention will now be described in greater detail, by way of example, with reference to the drawings in which:—

Figure 1 is a front elevational view, mostly in section, of a self-locking door handle assembly constructed in accordance with this invention, in which the handle is shown in the bolting position; and

Figure 2 is a view similar to figure 1 except that the handle is shown in the unbolting position.

In the accompanying drawings, a self-locking door handle assembly in accordance with this invention is generally designated 10 and is mounted in position on a door 11 having a dead bolt 12 which can project out of the door as in figure 1 and be withdrawn into same as in figure 2 by the handle device 10. Broadly, the self-locking handle assembly 10 comprises a stationary member 13 fixedly mounted on the door 11, a bolt actuator pin 14 rotatably extending through the stationary member 13 and operatively connected at one end with the dead bolt 12, a handle 15 rigidly connected to the other end of the bolt actuator pin 14 for moving the dead bolt 12 between its positions of Figures 1 and 2 through the pin 14, a lockpin 16 for locking the handle 15 against pivotal movement at least from its Figure 1 position; and thumbpiece or push-button 17 for unlocking the handle 15 prior to turning the same to its Figure 2 position.

The stationary member 13 is adapted to be conveniently secured to one of the faces of the door 11, in the adjacency of its free end, and has formed therethrough a double-stepped hole 18 extending in a direction normal to the plane of the door. The hole 18 has its diameter increased stepwise toward the door. Rotatably received in and extending through the hole 18 is the bolt actuator pin 14 having a diameter corresponding to that of the smallest diameter portion of the double-stepped hole. One of the ends of the bolt actuator pin 14 projects into the door 11 and terminates in a reduced diameter portion 19 which is connected to the dead bolt 12 in any known

or suitable manner, such that the dead bolt can be slide out of or withdrawn into the door by the rotation of the bolt actuator pin 14 about its own axis.

5 A collar 20 is fixedly mounted on the bolt actuator pin 14 and is rotatable fitted in a recess formed in the said one face of the door 11. Also mounted on the bolt actuator pin 14 is a spring engaging ring 10 21 which is urged against the collar 20 by a helical compression spring 22 mounted within the stationary member 13 and surrounding the bolt actuator pin 14. The bolt actuator pin 14 is therefore biased toward 15 the door 11.

Provided eccentrically in the stationary member 13 is a hole 23 which extends parallel to the double-stepped hole 18 and which is open only toward the handle 15. The 20 lockpin 16 is partly received in the hole 23 for axial sliding motion toward and away from the handle 15, and is biased toward the handle by another helical compression spring 25 mounted within the hole 23.

25 The handle 15 comprises an elongated grip 26 extending substantially parallel to the plane of the door 11, and an offset head 27 at one end of the grip 28. Disposed opposite to the stationary member 13, the handle 30 head 27 is rigidly connected, via a connector pin 28, to that end of the bolt actuator pin 14 which projects outwardly of the stationary member 13.

Thus, by holding and rotating the grip 35 26, the handle 15 can be turned about the axis of the bolt actuator pin 14 between a bolting position of Figure 1 and an unbolting position of Figure 2, which positions are angularly spaced substantially 90 40 degrees from each other. The dead bolt 12 projects out of the door 11 when the handle 15 is in the bolting position, and is withdrawn into the door when the handle is in the unbolting position. A washer 29 of plastics material is interposed between the stationary member 13 and the handle head 45 27 in order to relieve friction and to permit the handle to be turned smoothly between the bolting and the unbolting positions. 50 Preferably, a plurality of grooves or ridges are formed radially on one or both faces of the washer 29.

As shown in Figure 1, a stepped through hole 30 is provided in the head 27 of the 55 handle 15 and is held in axial registry with the lockpin receiving hole 23 in the stationary member 13 when the handle is in the bolting position of Figure 1. Loosely received in the outermost portion of this stepped through hole 30 is the thumbpiece 60 or pushbutton 17 which is substantially integrally provided with a shank 31 slidably extending through the hole 30 and terminating in an enlarged head 32 for end-to- 65 end abutment against the lockpin 16 when

the handle is in the bolting position. The shank head 32 is of the same diameter as the lockpin 16.

A helical compression spring 33 is coiled around the shank 31 for normally biasing 70 the thumbpiece 17 away from the door 11 together with the headed shank 31. The spring-biased thumbpiece 17 is held in the illustrated position as the shank head 32 is in contact with one of the steps of the 75 through hole 30. When depressed against the bias of the compression spring 33, the thumbpiece 17 comes into contact with another step of the through hole 30, in such a position that the end of the shank head 80 32 is held flush with the surface of the handle 27 which faces the stationary member 13.

In operation, when the handle 15 is in the bolting position of Figure 1, the dead 85 bolt 12 is extended out of the door 11, as mentioned previously, and is engaged in a corresponding socket in a doorframe (not shown) so that the door 11 is locked in the closed position. Also, when the handle 15 90 is in the bolting position, the lockpin receiving hole 23 in the stationary member 13 is in axial registry with the stepped through hole 30 in the handle head 27, with the result that the lockpin 16 is partly received 95 in the hole 30 under the bias of the compression spring 25 and partly received in the hole 23. The handle 15 is thus locked in the bolting position against any accidental toward the unbolting position. 100

For turning the handle 15 from the bolting position of Figure 1 to the unbolting position of Figure 2 and thus for opening 105 the door 11, the handle grip 26 is grasped with one hand, and the thumbpiece 17 on the handle is depressed with the thumb of the same hand against the bias of the compression spring 33, thereby pushing the 110 lockpin 16 out of the hole 30 through the headed shank 31 against the bias of the compression spring 25. The handle 15 thus unlocked is now turned to the unbolting position to thereby withdraw the dead bolt 12 into the door 11, and the door itself is 115 then opened.

When, with the door 11 subsequently closed, the handle 15 is turned from the unbolting back to the bolting position for 120 bolting the door, the lockpin 16 becomes received in the through hole 30 in the handle head 27 under the bias of the compression spring 25. The handle 15 is therefore automatically locked in the bolting position.

In the actual self-locking handle device 125 constructed in accordance with the invention, the handle 15 may have some undesired play with respect to the stationary member 13. However, since the compression spring 22 normally biases the bolt 130

(12)

actuator pin 14 toward the door 11 via the spring engaging ring 21 on the pin, the handle 15 is held positively urged toward the door 11 in spite of such possible play.

- 5 Although the self-locking handle device in accordance with this invention has been shown and described in terms of its preferable form, it is understood that the invention itself is not to be restricted by the exact details of this disclosure. For example, another set of hole 23, lockpin 16 and compression spring 25 may be provided in such a position on the stationary member 13, that the handle 15 will be thereby locked against movement in the unbolting position of Figure 2 as well. It is possible in this manner to obviate the possibility of accidentally throwing out the dead bolt while the door is open and, therefore, of damaging the dead bolt or the door-frame by closing the door with the dead bolt projecting therefrom.

WHAT WE CLAIM IS:—

1. A self-locking handle assembly comprising a stationary member adapted to be secured to a door, an actuator member extending through an aperture in the stationary member for actuating a dead bolt on rotational movement of the actuator member about its axis, a handle rigidly connected to the actuator member for manually rotating the actuator member between positions for bolting and unbolting the bolt and a locking member biased into its locking position by resilient means for locking the actuator member and handle in the bolting position and means for releasing the locking member to release the actuator member and handle.
2. An assembly according to claim 1, wherein the locking member comprises a lockpin supported by the stationary member for sliding movement toward and away from the handle and resilient means normally biasing the lockpin toward the

handles, the handle being adapted to be engaged and locked against movement by the lockpin at least in the bolting position; and wherein the releasing means is actuable manually for disengaging the lockpin from the handle against the bias of the resilient means.

3. An assembly according to claim 2, wherein the handle has a stepped through hole formed therein for partly receiving the lockpin when the handle is in the bolting position, and wherein the releasing means comprises a shank slidably received in the stepped through hole for end-to-end abutment against the lockpin when the handle is in the bolting position, and a thumbpiece formed on the shank for moving the shank toward the stationary member.

4. An assembly according to claim 3, wherein the releasing means further comprises second resilient means normally biasing the shank and the thumbpiece away from the stationary member.

5. An assembly according to any one of claims 1 to 4, wherein a washer is interposed between the stationary member and the handle to relieve friction and to permit smooth movement of the handle relative to the stationary member.

6. An assembly according to any one of claims 1 to 5, wherein second resilient means are mounted within the stationary member and are engaged with the bolt actuator member, the second resilient means normally biasing the handle toward the door.

7. A self-locking handle assembly substantially as herein described with references to the drawings.

For the Applicants:
J. F. WILLIAMS & CO.,
Chartered Patent Agents,
34 Tavistock Street,
London WC2E 7PB.

(12)

actuator pin 14 toward the door 11 via the spring engaging ring 21 on the pin, the handle 15 is held positively urged toward the door 11 in spite of such possible play.

5 Although the self-locking handle device in accordance with this invention has been shown and described in terms of its preferable form, it is understood that the invention itself is not to be restricted by the
10 exact details of this disclosure. For example, another set of hole 23, lockpin 16 and compression spring 25 may be provided in such a position on the stationary member 13, that the handle 15 will be
15 thereby locked against movement in the unbolting position of Figure 2 as well. It is possible in this manner to obviate the possibility of accidentally throwing out the dead bolt while the door is open and, there-
20 fore, of damaging the dead bolt or the door-frame by closing the door with the dead bolt projecting therefrom.

WHAT WE CLAIM IS:—

1. A self-locking handle assembly comprising a stationary member adapted to be secured to a door, an actuator member extending through an aperture in the stationary member for actuating a dead bolt on rotational movement of the actuator member about its axis, a handle rigidly connected to the actuator member for manually rotating the actuator member between positions for bolting and unbolting the bolt and a locking member biased into its locking position by resilient means for locking the actuator member and handle in the bolting position and means for releasing the locking member to release the actuator member and handle.

40 2. An assembly according to claim 1, wherein the locking member comprises a lockpin supported by the stationary member for sliding movement toward and away from the handle and resilient means normally biasing the lockpin toward the

handles, the handle being adapted to be engaged and locked against movement by the lockpin at least in the bolting position; and wherein the releasing means is actuable manually for disengaging the lockpin from the handle against the bias of the resilient means.

3. An assembly according to claim 2, wherein the handle has a stepped through hole formed therein for partly receiving the lockpin when the handle is in the bolting position, and wherein the releasing means comprises a shank slidably received in the stepped through hole for end-to-end abutment against the lockpin when the handle is in the bolting position, and a thumbpiece formed on the shank for moving the shank toward the stationary member.

4. An assembly according to claim 3, wherein the releasing means further comprises second resilient means normally biasing the shank and the thumbpiece away from the stationary member.

5. An assembly according to any one of claims 1 to 4, wherein a washer is interposed between the stationary member and the handle to relieve friction and to permit smooth movement of the handle relative to the stationary member.

6. An assembly according to any one of claims 1 to 5, wherein second resilient means are mounted within the stationary member and are engaged with the bolt actuator member, the second resilient means normally biasing the handle toward the door.

7. A self-locking handle assembly substantially as herein described with references to the drawings.

For the Applicants:
J. F. WILLIAMS & CO.,
Chartered Patent Agents,
34 Tavistock Street,
London WC2E 7PB.



* C L M S *