

EMERGENCY RELEASE SHUTTER ASSEMBLY

The present invention relates to security louver screens for windows and like openings and, in particular, to a security louver screen in which a desired number of blade elements may be released therefrom in the case of an emergency.

It is well appreciated that an occupant of a building in which security louver screens are installed in the windows may be trapped within the building in the event of a fire that closes off all other means of escape. Similarly, fire fighters and rescuers may be prevented from readily entering a building or targeting their hoses on a fire through a window in which such louver screens are installed.

In such instances, the saving of lives and property may depend on being able to rapidly remove one or more blade elements from the louver screen either by action of the occupant or outsider.

It is therefore an object of the present invention to provide a security louver screen for a window or like opening that includes the facility to rapidly remove one or more blade elements therefrom in the event of an emergency, but does not compromise the security and protection offered by the louver screen in normal circumstances.

According to the present invention there is provided a security louver screen for a window or like opening, comprising:-

a plurality of generally vertically disposed blade elements having upper and lower ends,

a lower mounting means for mounting the lower end of each blade element and upper mounting means for mounting the upper end of each blade element,

support means for removably supporting each of the lower mounting means, and

release means for releasing the upper end of each blade element from its respective upper mounting means when the lower mounting means is removed from the support means.

Preferably, the support means comprises a slotted casing having at least one casing slot and the lower mounting means includes casing slot engaging means.

It is preferred that the slotted casing includes a removable panel, whereby removal of the panel reveals the at least one casing slot so that the lower mounting means may be removed from the casing by disengaging the lower mounting means from the at least one casing slot.

The panel may be locked to the casing by a locking bar.

The locking bar may be slidably moved between a first locking position and a second unlocked position by operation of a drive means.

In a preferred form, the drive means is an electronically controlled actuator.

Preferably, the lower mounting means includes a slotted lower mounting member rotatable about a vertical axis and having a blade element lower mounting slot, whereby the lower end of a blade element is adapted to engage the lower mounting slot.

Preferably, the slotted lower mounting member is rotatably supported by a support housing which includes the casing slot engaging means.

The upper mounting means may include a slotted upper mounting member rotatable about a vertical axis and having a blade element upper

mounting slot, whereby the upper end of a blade element is adapted to engage the upper mounting slot.

It is preferred that the slotted upper mounting member is rotatably supported by a gear housing which is operably connected to a drive shaft
5 for controlling the movement of the blade elements.

Preferably, the slotted upper mounting member is adapted for release from the gear housing so that the upper end of the blade element may be released therefrom when the support housing is removed from the casing.

The slotted upper mounting member may be a releasable blade
10 spindle which includes a toothed rack portion that engages a worm gear.

In this embodiment, the worm gear is rotatably mounted on a common axis to the drive shaft, so that rotation of the drive shaft will cause rotation of the worm gear, thereby causing rotation of the blade spindle and the slottedly engaged blade element.

15 Preferably, the release means comprises a substantially cylindrical cavity formed in the gear housing, the cavity having a lower opening for allowing the rack portion of the blade spindle to be located within the cavity and for allowing the blade spindle with its slottedly engaged blade element upper end to be released from the cavity when the support housing
20 is removed from the casing.

In order that the invention may be readily understood and put into practical effect, reference will be made to the accompanying drawings, in which:-

Fig. 1 is a front elevational view of part of the upper end of a
25 window security louver screen according to a first embodiment of the invention,

Fig. 2 is a side elevational view of an actuator for a locking bar

enclosed within a lower casing for the security louver screen of Fig. 1,

Fig. 3 is a front elevational view of the actuator locking bar and casing of Fig. 2,

5 Fig. 4 is a top elevational view of part of the casing of Fig. 2 in which the face panel has been removed,

Fig. 5 is a perspective view of part of the casing shown in Figs. 2 and 4,

10 Fig. 6 is a sectional view of the gear housing for a blade element of the security louver screen of Fig. 1,

Fig. 7 is a side elevational view of a blade spindle for a blade element of the security louver screen of Fig. 1,

Fig. 8 is an enlarged top elevational view of a worm gear adapted to fit the gear housing of Fig. 6, and

15 Fig. 9 is a sectional view of the worm gear of Fig. 8.

The window security louver screen 10 shown, in part, in Fig. 1 has a number of vertical blade elements 11, 12 and 13, only three of which are shown, and an upper casing 21 and a lower casing 30 (as shown in Fig. 2) for mounting the upper and lower ends respectively of the blade elements.

20 Each of the blade elements 11, 12 and 13 comprise a central tubular part (not shown) and two oppositely extending wings 14 and 15 (as identified specifically with respect to blade element 11).

Each blade element is connected at its upper end to a blade spindle 16 (see also Fig. 7) via a slot 31 formed therein, which, in turn, is rotatably

25 connected by means of a toothed rack portion 32 of the spindle 16 to a worm drive 17 mounted in gear housing 18. Gear housing 18 has slot engaging means 35 with which it is mounted to the upper casing 21

through a slot formed in the lower panel 26 of the upper casing 21 (see Figs. 4 and 5 for identical slots 25 formed through the upper panel 26 of lower casing 30).

Each gear housing 18 and its respective worm drive 17 share a cylindrical passageway 33 for receiving therethrough a drive shaft 19. Formed longitudinally along the drive shaft 19 are three equidistant grooves 20. Formed on the surface of the cylindrical passageway 33 of each worm drive 17 are three equidistant lugs 34 that are adapted to engage within the grooves 20 of the drive shaft 19.

Although not shown, each blade element is similarly rotatably connected at its lower end to a lower blade spindle and support housing engaged to slotted casing 30. There are no gear components within the support housing and the lower blade spindle is able to freewheel within the support housing. The support housing is, in this instance, identical in form to gear housing 18, and is mounted to the lower casing 30 through a slot 25 formed in the lower casing 30.

Upon axial rotation of the drive shaft 19, the worm drive 17 will be caused to rotate axially therewith, which in turn will cause the blade spindle 16 to rotate about its cylindrical cavity 36 in the gear housing 18 in an axis perpendicular to the longitudinal axis of the drive shaft 19. Each blade element 11, 12, 13 will thereby be able to rotate between closed and open positions as required for normal operation of the louver screen 10. Axial rotation of the drive shaft 19 may be achieved by conventional means.

As shown in Fig. 2, the lower casing 30 encloses an electronically controlled actuator 22 which has ram means 23 adapted to be connected to a locking bar 27 and cause it to slide along the inside of a removable

panel 24 for the casing 30. The panel 24 extends along at least a part of the front face 38 of casing 30 and has an inner channel defined by channel forming members 28 and 29. When the locking bar 27 is slidably disengaged from the inner channel, the panel 24 may be removed quickly from the casing 30 so as to enable access to three support housings (as indicated in Fig. 4). These three support housings may then be manually slid out from their respective mounting slots 25 on casing 30, taking with them the lower ends of their respective blade elements. The upper ends of the blade elements will then readily fall out from their cylindrical cavities 36 in the upper gear housing 18.

Once the three blade elements are moved clear of the slots 25 in lower casing 30 and from the upper gear housings 18, sufficient open space will be available through the louver screen to enable a person to pass therethrough.

In an emergency situation where rapid release of one or more blade elements from the louver screen 10 is required, the actuator 22 may be actuated by emergency condition sensor rather than by human operator.

After an emergency has passed, the security feature of the louver screen may be restored by repositioning the blade elements with their blade spindle and support housing assemblies in their original place and by applying the removable panel 24 to the lower casing 30. Operating the actuator 22 in reverse current will cause the actuator 22 to reset the locking bar to the locked position.

Various other modifications may be made in details of design and construction without departing from the scope and ambit of the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A security louver screen for a window or like opening, comprising:-
a plurality of generally vertically disposed blade elements having upper and lower ends,
a lower mounting means for mounting the lower end of each blade element and upper mounting means for mounting the upper end of each blade element,
support means for removably supporting each of the lower mounting means, and
release means for releasing the upper end of each blade element from its respective upper mounting means when the lower mounting means is removed from the support means.
2. The security louver screen of claim 1 wherein the support means comprises a slotted casing having at least one casing slot and the lower mounting means includes casing slot engaging means.
3. The security louver screen of claim 2 wherein the slotted casing includes a removable panel, whereby removal of the panel reveals the at least one casing slot so that the lower mounting means may be removed from the casing by disengaging the lower mounting means from the at least one casing slot.
4. The security louver screen of claim 3 wherein the panel is locked to the casing by a locking bar.

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5. The security louver screen of claim 4 wherein the locking bar is slidably moved between a first locking position and a second unlocked position by operation of a drive means.

6. The security louver screen of claim 5 wherein the drive means is an electronically controlled actuator.

7. The security louver screen of any one of claims 1 to 6 wherein the lower mounting means includes a slotted lower mounting member rotatable about a vertical axis and having a blade element lower mounting slot, whereby the lower end of a blade element is adapted to engage the lower mounting slot.

8. The security louver screen of claim 7 wherein the slotted lower mounting member is rotatably supported by a support housing which includes the casing slot engaging means.

9. The security louver screen of any one of claims 1 to 8 wherein the upper mounting means includes a slotted upper mounting member rotatable about a vertical axis and having a blade element upper mounting slot, whereby the upper end of a blade element is adapted to engage the upper mounting slot.

10. The security louver screen of claim 9 wherein the slotted upper mounting member is rotatably supported by a gear housing which is operably connected to a drive shaft for controlling the movement of the blade elements.



11. The security louver screen of claim 10 wherein the slotted upper mounting member is adapted for release from the gear housing so that the upper end of the blade element may be released therefrom when the support housing is removed from the casing.
12. The security louver screen of claim 10 or claim 11 wherein the slotted upper mounting member is a releasable blade spindle which includes a toothed rack portion that engages a worm gear.
13. The security louver screen of claim 12 wherein the worm gear is rotatably mounted on a common axis to the drive shaft, so that rotation of the drive shaft will cause rotation of the worm gear, thereby causing rotation of the blade spindle and the slottedly engaged blade element.
14. The security louver screen of claim 12 or claim 13 wherein the release means comprises a substantially cylindrical cavity formed in the gear housing, the cavity having a lower opening for allowing the rack portion of the blade spindle to be located within the cavity and for allowing the blade spindle with its slottedly engaged blade element upper end to be released from the cavity when the support housing is removed from the casing.
15. A security louver screen substantially as hereinbefore described with reference to the drawings.

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