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A LOCKING MECHANISM FOR A PULL-ONLY BI-DIRECTIONAL DOOR

This invention relates to a locking mechanism for a bi-directional door, which allows the door to be pulled opened from either side, but prevents the door from being pushed open.

Known bi-directional doors such as those commonly used in restaurant kitchens can be pushed open from either side. Whereas this is desirable for waiters carrying food trays, as it allows hands free operation, it can be dangerous. If someone is on the other side of the door when it is opening, they can receive serious injuries. It is an object of the present invention to prevent this by allowing the door to be opened only by pulling it backwards from the door frame.

Mechanisms have been developed for locking bi-directional doors in their closed position. However, known mechanisms allow the door to be opened by pushing it forward through the frame opening. For example, the deadlock of United States Patent 4,739,638 discloses a triangular locking tongue having two inclined surfaces so that the latch can be conveniently used in a bi-directional door when opening the door either outwards or inwards. However, we have not been able to find a locking mechanism for a bi-directional door which allows opening inwards towards the person opening it, but prevents opening outwards away from the person. It is an object of the present invention to provide such a locking mechanism.

According to the present invention, a door locking mechanism comprises two strikers, and a striker plate assembly located in the door frame, such that operating a handle from one side of the door withdraws one striker from engagement with its striker plate allowing the door to be pulled but not pushed open and operating a handle from the other side withdraws the other striker from its striker plate allowing the door to be pulled but not pushed open in the other direction.

The invention is described in greater detail below by way of example only, with



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reference to the accompanying drawings in which:

Figure 1 is a perspective view of the locking mechanism installed in a door and door frame;

Figure 2 is a perspective view of the door opening in the opposite direction to that of Figure 1;

Figures 3 and 4 are exploded views from opposite directions of the locking mechanism containing the strikers

Figure 5 is an internal view of the assembled locking mechanism, and

Figure 6 is an exploded view of an alternative embodiment of the invention

In Figure 1, the body of the locking mechanism is shown recessed into the side of the door with opening handles 1A and 1B. A striker plate assembly 3 containing two striker plates 3A and 3B which engage the two strikers 4A and 4B protruding from the mechanism 2 is recessed into the side of the door frame. When handle 1A is rotated, striker 4B is withdrawn from striker plate 3B, allowing the door to be pulled open. When handle 1B is rotated, striker 4A is withdrawn from striker plate 3A, allowing the door to be pulled open from the other side as shown in Figure 2. The door has a bi-directional hinge mechanism, allowing for opening in either direction.

Figures 3 and 4 show the internal mechanism which enables the withdrawal of strikers 4A and 4B from their respective striking plates 3A and 3B. When handle 1B is turned clockwise, it engages and rotates a lever 5 which has an upper section 6 protruding inwards. This section 6 in turn causes lever 7 to rotate in an anti-clockwise direction, encountering the raised button 8A on the shaft of striker 4A, thus causing the latter to withdraw from the striker plate 3A.

When handle 1A is rotated, it engages lever 9 which in turn causes lever 10 to rotate

anti-clockwise, thereby encountering the button 8B on the shaft of striker 4B causing it to withdraw from striker plate 3B. Striker guides 11A and 11B form apertures which guide the shafts of the strikers 4A and 4B. Figure 5 shows springs 12A and 12B which bias strikers 4A and 4B to the locking position.

It will be obvious to one skilled in the art that different internal mechanisms could be used to achieve the withdrawal of the appropriate striker on the turning of the respective handle. All such modifications of the internal mechanism fall within the scope of the present invention.

It is also possible to design the locking mechanism so that both strikers face each other, in horizontal alignment with a space between the striking faces. In this case, the striker assembly contains a vertical plate which locates in the space between the striker faces. Figure 6 is an exploded view of a locking mechanism showing strikers 4A and 4B in horizontal alignment. The alternating withdrawal of the strikers is the same and this modified mechanism also falls within the scope of the present invention.

Many different bi-directional hinges are known and the mechanism of the present invention is not limited to any particular hinging system. Further, it may be desirable to seal the gap between the edge of the door which receives the locking mechanism and the door frame, by means of a resilient elastomeric sealing strip. All such sealing devices are also compatible with the locking mechanism of this invention.

CLAIMS:-

1. A locking mechanism for a bi-directional door comprising two strikers and a striker plate assembly located in the door frame such that operating a handle on one side of the door withdraws one striker from its striker plate allowing the door to be pulled but not pushed open, and operating a handle on the other side of the door withdraws the other striker from its striker plate allowing the door to be pulled but not pushed open in the other direction.
2. The locking mechanism of claim 1 in which the operation of a handle withdraws the striker furthest removed from the said handle from its striker plate.
3. The locking mechanism of claim 1 in which the two strikers are one above the other and the striker plate assembly has two corresponding plate recesses to receive the two strikers.
4. The locking mechanism of claim 1 in which the two strikers are horizontally opposed and the striker plate assembly contains a vertical striker plate which locates between the two strikers.
5. Any novel feature or combination of features disclosed herein.