

A COVER FOR A MORTICE LOCK ASSEMBLY

This invention relates to a cover for forming part of a lock assembly and a lock assembly including such a cover. The cover has been designed for forming part of a mortice lock assembly and it will be convenient to hereinafter describe the invention with reference to this type of lock assembly. It should be appreciated however that the cover may also be suitable for other lock assemblies such as a cylindrical or rim lock assembly, and the invention is not to be limited to mortice lock assemblies.

It is generally desirable to provide locks that can be adjusted to satisfy a range of functions. This enables the locksmith to operate with a smaller inventory of locks. It is also becoming increasingly desirable for the locks to be adjustable as part of the installation process. In the case of mortice locks it is preferred that the one lock be capable of being installed in a mortice cavity formed in the left hand edge or right hand edge of the door. It may also be desirable to adjust the lock and release operation of the inner or outer handle. The designation of the inner and outer handle will naturally be dependant upon which edge the lock is installed.

The adjustment of some mortice locks requires the side wall plate of the housing to be removed to provide clear access to the inner elements of the lock. Alternatively the side plate or end wall is provided with apertures adjacent the elements that require adjustment. This allows adjustment of the mortice lock just prior to installation in the mortice cavity. Another alternative is for the elements to be located adjacent the cylinder lock or handle apertures, or for apertures to be formed through the front wall of the lock housing, to allow for adjustment when the mortice lock has been installed. There is a perception however that this adversely impacts on the security of the lock as, once the lock is installed, it allows for adjustment by unauthorised persons.

It would be desirable to provide a product that addressed at least one of these issues.

A reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or matter was, in Australia,

known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

According to one aspect of this invention there is provided a cover for forming
5 part of a lock assembly, the lock assembly including a housing, a bolt being movable relative to an extended position, an actuator located within the housing which is operable to move the bolt from the extended position, and a lock means located within the housing for controlling operation of the actuator, the cover being positionable relative to the housing, the cover including interaction means for
10 interacting with the lock means so as to retain the cover in the position relative to the housing while the lock means is in a retain condition, and the condition of the lock means is adjustable to adopt a release condition in which condition the cover can be released from said position.

15 It is preferred that the lock means include a plate that when the cover is in said position the plate is adjacent the housing. It is further preferred that when the cover is in said position the plate is adjacent a front wall of the housing. It is further preferred that the plate includes an aperture through which the bolt extends when in the extended position. It is further preferred to include at least one fastener for fastening
20 the plate to the housing. The preferred fastener is a screw and the plate includes at least one aperture for accommodating the screw. It is preferred that the plate is a face plate.

It is preferred that the lock means includes a cylinder lock that is operable by a
25 key for adjusting the condition of the lock means. The lock means preferably includes a detent that interacts with the interaction means, whereby the detent is in an active condition when the lock means is in the retain condition so that the interaction means is prevented from detaching from the lock means, and when the condition of the lock means is adjusted to the release condition the detent is in an inactive condition and
30 the interaction means can be detached from the lock means. The detent preferably includes a biasing means for urging the detent to adopt the active condition. The detent preferably includes a slide which is movable by operation of the lock means when the detent is adjusted from the active condition, and movable by operation of the biasing means when the detent is adjusted from the inactive condition. The slide
35 preferably locates behind a shoulder on the interaction means when the cover is in

preferably locates behind a shoulder on the interaction means when the cover is in said position and the detent is in the active condition. The interaction means preferably includes a shaft extending from the plate with the shoulder located at a distal end of the shaft. The lock means preferably includes a recess adjacent the slide
5 for receiving the distal end of the shaft. It is preferred that the slide encroaches into the recess when the detent is in the active condition.

It is preferred that the lock means includes a cam that is rotatable relative to the slide when adjusting the detent from the active condition. It is preferred that the
10 cam is attached to a barrel of the cylinder lock.

It is preferred that the actuator includes an inner hub and an outer hub which are located within the housing and are rotatable about an axis to retract the bolt. It is preferred that the cover includes a follower which is rotatable on rotation of either the
15 inner hub or outer hub and engages the bolt.

According to another aspect of this invention there is provided a lock assembly including a cover as herein before defined. It is preferred that the lock assembly is a mortice lock assembly.
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It will be convenient to hereinafter to describe the invention in greater detail by reference to the accompanying drawings which show an example embodiment of the invention. Particularity of the drawings and the related detailed description is not to be understood as superseding the generality of the preceding broad description of the
25 invention.

Figure 1 is an isometric view of a mortice lock assembly according to the invention.

30 Figure 2 is an exploded view of a mortice lock assembly from Figure 1.

Figure 3 is a side elevation view of the mortice lock assembly from Figure 1 with the cover in a released position.

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Figure 4 is a side elevation view from Figure 3 with the cover in the retained position.

Figure 5 is a part exploded view of the cover and part of the lock means.

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Figure 1 illustrates a mortice lock assembly 1 for use with a door (not shown). The mortice lock assembly 1 includes a housing 2 with a faceplate 3 attached to a

front wall of the housing 2. The faceplate 3 is a preferred embodiment of a part of a cover according to one aspect of the invention. The faceplate 3 and the manner in which it is attached to the housing 2 will be described in greater detail with reference to later illustrations.

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The housing 2 includes an aperture 4 in an upper portion thereof to permit a cylinder lock to interact with a cam sub-assembly 5. The cam sub assembly forms part of a lock means which controls operation of an actuator. The housing 2 also includes an aperture 6 in a lower portion thereof for permitting interaction between
10 door furniture (not shown), including for example handles, knobs or the like, to interact with a hub sub-assembly 7. The hub sub assembly forms part of the actuator which is operable to retract a latchbolt assembly. The manner in which the lock means interacts with the actuator is adjustable and will be describe later in the specification.

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Figure 2 illustrates the front wall of the housing 8 and the faceplate 3, each including an aperture 13, 14 respectively through which a head 15 of the bolt assembly 16 can extend to adopt an extended position. The preferred latch bolt assembly 16 illustrated includes a draw bar 17 to which the head 15 of the latch bolt is mounted. A compression spring 18 is included to act on the bolt assembly 16, and
20 urge the head 15 to adopt the extended position (see Figure 3). The draw bar 17 interacts with a follower 19 of the hub sub-assembly 7, so as to retract the latch bolt assembly 16. The follower 19 forms part of this actuator.

Figure 2 also illustrates a dead latching sub-assembly 43 which in summary
25 interacts with the draw bar 17 for retaining the latch bolt assembly 16 in a dead latched position. It would be understood by those in the industry that the interaction between the dead latch sub-assembly 43 and the latch bolt assembly 16 is one that resists movement of the latch bolt assembly 16 from the extended position when applying a force to the head 15 of the latch bolt assembly 16, when the tongue 44 of
30 the dead latch sub-assembly 43 is in an extended position (See Figure 3).

It can be appreciated from Figure 2 that the housing 2 is formed by an inner part 9 and outer part 11 which are fastened together by fasteners in the form of screws 10. While the inner part 9 could be separated from the outer part 11 to adjust
35 the manner in which the lock means interacts with the actuator, the preferred mortice

lock assembly illustrated includes a selector 12 which operates to select the way in which the lock means interacts with the actuator. The selector illustrated includes an adjustable member 21 in the shape of a pentagon. A rear surface of the adjustable member 21 is formed with a plurality of projections 23. The projections 23 extend through apertures formed in a retainer plate 24 and interact with elongate members 25 linking the adjustable member 21 with the hub sub-assembly 7. A flange 26 is also provided and located behind the front wall 8 of the housing part 9 for fixing the position of the adjustable member 21 relative to the housing 2. The flange 26 includes a plurality of bores 27 to accommodate each of the elongate members 25. The length of each of the projections 23 for each side of the pentagon 21 varies, so that the degree to which the elongate members 25 are moved will be dependent upon the rotational position of the adjustable member 25.

The hub sub-assembly illustrated in Figure 2 includes a hub assembly housing 28 which houses an inner hub and an outer hub (not shown in Figure 2). Figure 3 illustrates the inner hub 15 including a spindle aperture 16 for accommodating a spindle of the inner handle. Each of the hubs interacts with separate spindles (not shown) of an inner and outer handle (not shown), to independently rotate the follower 19 about an axis XX.

Figure 3 also illustrates a detent slide 17 and an inner pawl which both form part of the lock means. Figure 3 illustrates the elongate member 25 of the selector 12 urging the inner pawl 18 to disengage from the detent slide 17. The inner pawl 18 is considered to be in an inactive condition when it is disengaged from the detent slide 17. Rotation of the adjustable member 21 so that the inner elongate member 25 is not aligned with a projection 23, allows the pawl 18 to rotate under the action of a leaf spring 19. The rotation causes the pawl 18 to engage the detent slide 17 so as to be movable therewith. The inner pawl 18 is considered to be in an active condition when it engages the detent slide 17. While the inner pawl 18 is in the active condition, movement of the slide 17 will rotate the pawl 18 between a locked condition and an unlocked condition. When the pawl 18 is in a locked condition (not shown) it impedes rotation of the inner hub 15. It ought to be appreciated that the outer pawl interacts with the outer hub in the same manner.

The cam sub-assembly 5 is operable to complete a range of functions including to move the detent slide 17 between a raised and lowered position. Figure 3 illustrates the detent slide 17 in a lowered position and can be moved to a raised position by rotation of a lever 20 (See also Figure 2) within the cam sub assembly 5 housing. The lever is rotated about its fulcrum 29. The lever 20 interacts with a sliding follower 30, which slides in response to rotation of either an inner cam 31 or outer cam 32 (see figure 2), towards the front 8 of the housing 2. Each of the cams 31, 32 interacts with a respective tail bar 33, 34 connected to a barrel of an inner or outer cylinder lock assembly. Figure 2 shows a tailbar 34 attached to a barrel of the outer cylinder lock assembly 35 only, and reveals a projection 36 on a rear surface of the tail bar 34. The projection is shaped to interact with a central aperture 37 formed in the outer cam 32 so as to allow for loss motion between the cam 32 and the tail bar 34. Clearly the shape of the aperture 37 and the projection 36 may vary while still allowing for loss motion. Figure 2 also illustrates a torsion spring 39 that acts on the lever to urge the detent slide 17 to adopt either the raised or lowered position.

The cam sub-assembly 5 also operates to move a latch bolt retraction slide 40 which interacts with the follower 19. The inner cam 31 and outer cam 32 will interact with the latch bolt retraction slide 40 upon rotation of either cam towards the rear of the housing 2.

The faceplate illustrated in figure 2 is a preferred embodiment of a plate forming part of the cover according to one aspect of the invention. The face plate illustrated is located in its preferred position adjacent the front wall 8 of the housing 2, and obstructs access to the adjustable member 21 when attached to the housing. It ought to be appreciated that the shape of the plate may vary and it is not necessary that it extend the full length of the front 8 of the housing 2. Rather it is preferred that the plate cover at least the adjustable member 21 so as to control adjustment of the selector means 12. Accordingly the plate of the cover may be in addition to a face plate, however it is preferred to combine it as part of the face plate, particularly when the selector 12 is operable from the front of the housing 2. Naturally if the selector 12 was located elsewhere in the housing being operable from the side of the housing and accessible via the aperture 4, 6 for the lock means or the actuator, the plate of the cover may be positioned adjacent one or both of those apertures. Furthermore the plate could be separate from or integral with a furniture plate, escutcheon, rose or the

like. Accordingly the position of the cover relative to the housing is not to be limited to just adjacent the front wall 8 of the housing.

5 The cover according to the invention includes an interaction means 41 for interacting with the lock means. The preferred shape and location of the interaction means is illustrated in figure 2, however it should be appreciated that the interaction means is not to be limited to that illustrated in figure. The preferred form of interaction means illustrated is a shaft 42, a proximal end of which is connected to the plate 3. A distal end of the shaft is configured to engage the lock means so as to retain the
10 cover in the preferred position relative to the housing 2. The distal end of the shaft 42 may be configured in any suitable manner, however in the preferred embodiment illustrated the preferred configuration includes a groove 44 and shoulder 45 adjacent the distal end. (See Figure 5)

15 The distal end of the shaft locates within a recess formed in the cam sub assembly housing which can be appreciated from figure 4 or 5. The interaction means 41 preferably interacts with a detent 47 associated with the lock means. The preferred detent 47 is illustrated in figure 2 and includes a slide portion 48, with an inner arm and an outer arm extending from the slide portion. A biasing means 49, preferably in
20 the form of a spring acts on the slide 48 to urge the detent to adopt an active condition. Figure 5 illustrates the detent 47 in the active condition whereby the slide 48 encroaches the recess 46 in the cam sub assembly housing. The distal end of the shaft preferably includes a ramped leading surface so that the detent 47 is urged away from the active condition as the distal end shaft 42 enters the recess 46. The
25 detent 47 will then return to an active condition once the slide 48 is aligned with the groove 44 in the shaft 42, as illustrated in figure 4.

The lock means 41 is also operable to control the release of the interaction means. This may be achieved in any suitable manner however the preferred
30 arrangement is that the lock means includes a cam that interacts with the detent. In the embodiment illustrated the cam is formed by a circumferential surface formed on each tail bar 33, 34, which interacts with the inner arm 50 or outer arm 51 extending from the slide 48. Figure 4 illustrates the detent 47 in the active condition whereby the cover is retained in its position. In comparison figure 3 illustrates the tailbar 33 having
35 been rotated so that the cam surface moves the inner arm 50 to cause the detent 47

to adopt the inactive condition. This permits the cover to be moved from its position adjacent the housing 2. Clearly the cam may be formed separately from the tail bar 33.

5 It ought to be appreciated from the foregoing that where the rotation of the tailbar is controlled by a cylinder lock, the cover can only be detached from the housing by a user with a key. This is particularly advantageous where the cover obstructs access elements of the lock associated with controlling the way in which the lock functions.

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Various alterations or modifications may be introduced into the cover and mortice lock as hereinbefore described without departing from the spirit or ambit of the invention.

15 Future patent applications may be filed in Australia or overseas on the basis of or claiming priority from the present application. It is to be understood that the following claims are provided by way of example only, and are not intended to limit the scope of what may be claimed in any such future application. Features may be added to or omitted from the claims at a later date so as to further define or re-define
20 the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A cover for forming part of a lock assembly, the lock assembly including a housing, a bolt being movable relative to an extended position, an actuator located within the housing which is operable to move the bolt from the extended position, and a lock means located within the housing for controlling operation of the actuator, the cover being positionable relative to the housing, the cover including interaction means for interacting with the lock means so as to retain the cover in the position relative to the housing while the lock means is in a retain condition, and the condition of the lock means is adjustable to adopt a release condition in which condition the cover can be released from said position.
2. A cover according to claim 1 including a plate that when the cover is in said position the plate is adjacent the housing.
3. A cover according to claim 2 wherein when the cover is in said position the plate is adjacent a front wall of the housing.
4. A cover according to claim 2 or 3 wherein the plate includes an aperture through which the bolt extends when in the extended position.
5. A cover according to any one of claims 2 to 4 including at least one fastener for fastening the plate to the housing.
6. A cover according to claim 5 wherein the fastener is a screw and the plate includes at least one aperture for accommodating the screw.
7. A cover according to any one of claims 2 to 6 wherein the plate is a face plate.
8. A cover according to any one of the preceding claims wherein the lock means includes a cylinder lock that is operable by a key for adjusting the condition of the lock means.
9. A cover according to any one of the preceding claims wherein the lock means includes a detent that interacts with the interaction means, whereby the detent is in an active condition when the lock means is in the retain condition so that

the interaction means is prevented from detaching from the lock means, and when the condition of the lock means is adjusted to the release condition the detent is in an inactive condition and the interaction means can be detached from the lock means.

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10. A cover according to claim 9 wherein the detent includes a biasing means for urging the detent to adopt the active condition.

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11. A cover according to claim 9 or 10 wherein the detent includes a slide which is movable by operation of the lock means when the detent is adjusted from the active condition, and movable by operation of the biasing means when the detent is adjusted from the inactive condition.

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12. A cover according to claim 11 wherein the slide locates behind a shoulder on the interaction means when the cover is in said position and the detent is in the active condition.

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13. A cover according to claim 12 wherein the interaction means includes a shaft extending from the plate with the shoulder located at a distal end of the shaft.

14. A cover according to claim 13 wherein the lock means includes a recess adjacent the slide for receiving the distal end of the shaft.

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15. A cover according to claim 14 wherein the slide encroaches into the recess when the detent is in the active condition.

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16. A cover according to any one of claims 11 to 15 wherein the lock means includes a cam that is rotatable relative to the slide when adjusting the detent from the active condition.

17. A cover according to claim 16 wherein the cam is attached to a barrel of the cylinder lock.

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18. A cover according to any one of the preceding claims wherein the actuator includes an inner hub and an outer hub which are located within the housing and are rotatable about an axis to retract the bolt.

19. A cover according to claim 18 wherein the actuator includes a follower which is rotatable on rotation of either the inner hub or outer hub and engages the bolt.
20. A lock assembly including a cover according to any one of the preceding claims.
21. A cover according to any one of the preceding claims wherein the lock assembly is a mortice lock assembly.