A MORTICE LOCK ASSEMBLY THAT IS OPERABLE IN A HOLDBACK MODE AND ANTI-LOCKOUT MODE

TECHNICAL FIELD

[0001] This invention relates to a mortice lock assembly for use in a door including a housing, with a latchbolt movable relative to the housing. More specifically the mortice lock assembly is of the kind including an actuator for moving the latchbolt from an extended position to a retracted position, a latchbolt biasing means for urging the latchbolt towards the extended position, and a lock means is included to control operation of the actuator.

BACKGROUND OF INVENTION

[0002] The mortice lock assembly according to the foregoing kind, when in use, will generally form part of a lockset including inner door furniture and outer door furniture located on the inner side and outer side of the door respectively. The door furniture may include a handle or knob for interacting with the actuator, and a cylinder for interacting with the lock means. The lockset may be installed in a range of environments and it is generally desirable that the manner in which the mortice lock operates is adjustable to suit those environments.

[0003] The mortice lock assembly may be installed in an environment where the door is exposed to high traffic for a part of the day, and is required to be secured in a closed position for other parts of the day. One example of this might be the front door of a public building, such as a library or school, where there is a high volume of traffic through the door during the day. The door may be urged towards a closed position by a door closer or sprung hinge. During the day, given the volume of traffic, it is desirable not to have to retract the latchbolt each time before moving the door from the closed position. However at night the door must be secured in a closed condition.

[0004] The mortice lock assembly may be installed in an environment where the door leads to a secure room requiring a reasonable level of security, such as a store room or the like. The lockset will include a cylinder lock on the outer side of the door, but may not include a cylinder lock on the inner side of the door. Alternatively, while a cylinder lock may be installed on the inner side of the door, the person may leave

their keys in the outer cylinder lock. If the outer cylinder lock has adjusted the lock means to prevent operation of the actuators, and the door has been closed behind the person entering the store room, the person can be locked in the store room. This naturally presents a safety problem.

[0005] It would be desirable to provide a mortice lock assembly that was adjustable to suit multiple environments.

[0006] 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.

SUMMARY OF INVENTION

[0007] According to this invention there is provided a mortice lock assembly for use with a door including a housing, a latchbolt assembly including a head that is movable between an extended position whereby the head extends out from a front wall of the housing and a retracted position whereby the head is substantially retracted into the housing, an actuator assembly that is operable to move the latchbolt assembly from the extended position towards the retracted position, a latchbolt biasing means for biasing the latchbolt assembly towards the extended position, a lock means that is adjustable between an inactive condition and an active condition whereby in an inactive condition the actuator assembly is operable to move the latchbolt assembly from the extended position towards the retracted position and an active condition whereby the actuator is rendered inoperable to move the latchbolt assembly from the extended position towards the retracted position, a selector means adjustable at the front wall for selecting a mode of operation including hold back mode whereby the latchbolt assembly is retained in the retracted position, an anti-lockout mode whereby movement of the latchbolt assembly to the retracted position prevents the lock means remaining in the active condition.

[0008] It is preferred that the latchbolt assembly includes a body with the head attached to the body, the position of the head being adjustable relative to the body between a first position whereby adjustment of the selector means at the front wall is inhibited and a second position whereby the selector means is adjustable to select the

mode of operation. It is preferred that the head is configured relative to the front wall so that when the head is in the in first position the latchbolt assembly can move between the extended position and the retracted position, and when the head is in the second position the latchbolt assembly is inhibited from moving between the extended position and the retracted position. It is further preferred that the mortice lock assembly include a face plate for location adjacent the front wall of the housing, the head being inhibited from adopting the second position when the face plate is located adjacent the front wall of the housing. It is preferred that the face plate is attachable to housing adjacent the front wall by at least one fastener, the fastener allowing for detachment of the face plate so as to allow adjustment of the head to adopt the second position. These preferred arrangements inhibit access to operation of the selector so as to reduce the likelihood of the selector being tampered with by unauthorised persons.

[0009] It is preferred that the selector means includes a selector member that is rotated about a selector axis to adjust the mode of operation. It is further preferred that the selector means is configured so as to inhibit rotation of the selector member about the selector axis. Preferably wherein said configuration includes the selector means having a ball detent and the selector member having an external surface which interacts with the ball detent. It is further preferred that the selector member has an external surface including at least two ball recesses for accommodating the ball detent when the selector means adopts the hold back mode and the anti-lockout mode respectively. It is further preferred that the at least two ball recesses are on opposed sides of the selector member. These preferred arrangements reduce the likelihood of unintentional operation of the selector.

[0010] It is preferred that the selector member includes a proximal end having a drive surface configured to facilitate an in use connection to a driver when rotating the selector member. The lock means preferably includes a slide detent which moves relative to the housing when adjusting the condition of the lock means between the active condition and an inactive condition, the selector member includes a distal end that is configured to interact with the slide detent lock when the selector means is operating in the anti-lockout mode or the holdback mode. The distal end preferably includes a ramp surface that interacts with the slide detent when the lock means is in the active condition and the selector means is in the anti-lockout mode so that

movement of the latchbolt assembly to the retracted position adjusts the position of the slide detent. The slide detent preferably includes a lug that interacts with the distal end of the selector member when the selector means is in the hold back mode and the latchbolt assembly is moved to the retracted position.

[0011] It is preferred that the distal end of the selector member includes a recess that interacts with the lug when the selector means is in the hold back mode, so that when the latchbolt assembly is in the retracted position and the lock means is adjusted from the active condition to the inactive condition movement of the latchbolt assembly from the retracted position is inhibited. It is preferred that the position of the lug relative to the slide detent is adjusted when the lock means is in the active condition and the latchbolt assembly is moved to the retracted position so as to prevent the lug locating in the recess. The position of the lug is preferably adjustable by pivoting relative to the slide detent between a first position and a second position, the lug being configured to bias towards adopting the first position.

[0012] It is preferred that the selector means is movable with the latchbolt assembly between the extended position and the retracted position. The selector means is preferably adjustable to adopt a normal mode of operation. It is further preferred that when the selector means is adjusted to adopt normal mode, the selector means is configured to avoid engaging the lock means when the latchbolt assembly moves to the retracted position.

BRIEF DESCRIPTION OF DRAWINGS

[0013] It will be convenient to hereinafter describe in a preferred embodiment of the mortice lock assembly according to the invention in greater detail by reference to the attached illustrations. The drawings and following detailed description are merely illustrative of how the invention might be put into effect. The specific form and arrangement of the various features as shown is not to be understood as limiting on the invention.

[0014] Figure 1 is an isometric partly exploded illustration of a lockset incorporating a preferred embodiment of the mortice lock assembly according to the invention prior to installation in a door.

[0015] Figure 2 is an isometric view of the mortice lock assembly from Figure 1 with a cover plate removed from the lock housing and an outer cylinder lock assembly fixed to the mortice lock housing.

[0016] Figure 3 is a front elevation view of the mortice lock assembly from Figure 2 with the latchbolt assembly in an extended position, and the selector means in a normal "O" mode of operation.

[0017] Figure 4 is a front elevation view of the mortice lock assembly from Figure 3 with the latchbolt assembly in a retracted position, and a lock means in an inactive condition.

[0018] Figure 5 is a front elevation view of the mortice lock assembly from Figure 4 with the lock means in an active condition.

[0019] Figure 6 is a front elevation view of the mortice lock assembly from Figure 2 with the latchbolt assembly in an extended position, and the selector means in a holdback "H" mode of operation.

[0020] Figure 7 is a front elevation view of the mortice lock assembly from Figure 6 with the latchbolt assembly in the retracted position and the lock means in an inactive condition.

[0021] Figure 8 is a front elevation view of the mortice lock assembly from Figure 7 with the lock means in an active condition holding back the latchbolt assembly.

[0022] Figure 9 is a front elevation view of the mortice lock assembly from Figure 6 with the lock means in an active condition.

[0023] Figure 10 is a front elevation view of the mortice lock assembly from Figure 9 with the lug deflected.

[0024] Figure 11 is a front elevation view of the mortice lock assembly from Figure 2 with the latchbolt assembly in an extended position, and the selector means in an anti-lockout "A" mode of operation and the lock means in an active condition.

[0025] Figure 12 is a front elevation view of the mortice lock assembly from Figure 11 with the latchbolt assembly in a partially retracted position.

[0026] Figure 13 is a front elevation view of the mortice lock assembly from Figure 12 with the latchbolt assembly in a retracted position, and the lock means in an inactive condition.

[0027] Figure 14 is an exploded view of the latchbolt assembly, deadlatch mechanism and selector means.

[0028] Figure 15 is a side elevation view of the mortice lock assembly from Figure 2, with the face plate removed and the head of the latchbolt assembly rotated to reveal the selector means.

DETAILED DESCRIPTION OF THE DRAWINGS

[0029] Referring now to Figure 1 which illustrates an example of a lockset 1 including in summary a mortice lock assembly 2, inner door furniture 3 and outer door furniture 4. The mortice lock assembly 2 includes a housing 5 which in use is located in a mortice cavity 6 formed in a side edge of a door 7. The inner door furniture 3 is positioned adjacent an inner side of the door 7, and the outer door furniture 4 is positioned adjacent an outer side of the door 7.

[0030] The inner door furniture 3 illustrated in Figure 1 includes a rectangular shaped inner escutcheon 8, an inner lever handle 99 and an inner cylinder lock assembly 9, which in use is aligned with an opening 10 in the inner escutcheon 8. The outer door furniture includes an outer rectangular shaped escutcheon 11, an outer lever handle 12, and an outer cylinder lock assembly 13. Again, the outer cylinder lock assembly 13 is located in an opening 14 in the outer escutcheon 11 when the lockset is in use. The inner lever handle 99 and outer lever handle 12 are each rotatable about an actuator axis XX so as to rotate an inner spindle 15 and outer spindle 16 respectively.

[0031] The inner spindle 15 and outer spindle 16 interact with an actuator 17 of the mortice lock assembly 2, only a portion of which is visible in Figure 1. The actuator 17 will be described in greater detail with reference to later illustrations. It should be appreciated that the inner handle 99 and outer handle 12 illustrated are merely one preferred form of hand engageable member suitable for rotating the inner

spindle 15 and outer spindle 16. The inner handle 99 and outer handle 12 may be replaced by a turn knob or the like.

[0032] The inner cylinder lock assembly 9 and outer cylinder lock assembly 13 each include a casing 19, and a barrel 20 (only the inner barrel 20 is visible in Figure 1) that is rotatable within the casing 19 by inserting an appropriate key (not shown). A cam 21 (only a cam on the outer cylinder lock 19 is visible in Figure 1) is attached to the rear of the barrel 20 so as to rotate with the barrel 20. The cam 21 interacts with features of the mortice lock assembly 2 in a manner that will be described in greater detail with reference to later illustrations. It should be appreciated however, that the shape of the cam 21 may vary from that illustrated in Figure 1 depending upon which features are within the mortice lock assembly are to be interacted with. Furthermore, whilst Figure 1 suggests pin tumbler cylinder lock assemblies, the invention may include any form of cylinder lock assembly.

[0033] The housing illustrated in Figure 1 includes a base 22 and, a cover 23 attached to the base 22 by screw fasteners 24. A front wall 25 is attached to the base 22 by screw fasteners 18 (see Figure 15). A face plate 26 is also attached to the base 22 through the front wall 25 by way of screw fasteners 27. The face plate 26 is intended to be detachable from the housing 5 by removing the screw fasteners 27 when the door 7 is in a open condition, for adjusting the mode of operation that will be explained in greater detail by reference to later illustrations.

[0034] Referring now to Figure 2 which illustrates the mortice lock assembly with the cover 23 detached from the base 22 to reveal the internal elements of the mortice lock 2. Whilst Figure 2 illustrates what is referred to as a standard back set, it is to be appreciated that the invention may also be applicable to a short back set and a long back set.

[0035] The invention includes a latchbolt assembly 28 which may take any form. Figure 2 illustrates the latchbolt assembly 28 having a bevelled head 29 attached to a body 30. The shape of the head 29 may vary from the bevelled shape as illustrated, as for example, the head 29 may instead have a bull nose shape. The latchbolt assembly 28 is illustrated in an extended position whereby the head 29 projects out through an opening in the front wall 25. A latchbolt biasing means 31 illustrated in the

preferred form of a compression spring acts between the latchbolt assembly 28 and an abutment 32. The abutment 32 illustrated is fixed in position relative to the housing 7, however, it could alternatively be formed integrally with the housing 7. The latchbolt biasing means 31 acts on the latchbolt assembly 28 to bias it towards the extended position as illustrated in Figure 2.

[0036] Figure 2 also illustrates an auxiliary bolt 34 having a wedge shaped head 33 extending out through another opening in the front wall 25. The auxiliary bolt also includes a body 35 which is located behind the front wall 25 within the housing 7 so as to interact with a deadlocking mechanism 36 located on the body 30 of the latchbolt assembly 28. An auxiliary bolt biasing means 37, illustrated again in the preferred form of a compression spring, acts between the auxiliary bolt 34 and an abutment 88. The abutment 88 is illustrated as formed integrally with the base. The auxiliary bolt biasing means 37 biases the auxiliary bolt towards the extended position as illustrated in Figure 2.

[0037] The deadlocking mechanism 36 includes a deadlocking member 38 which must be positioned to avoid contact with a stop 39 associated with the base 22, in order that the latchbolt assembly 28 can be moved from the extended position. Whilst the auxiliary bolt 34 remains in an extended position such as when the door 7 is in an open position, the deadlocking member 38 will avoid engaging the stop 39. However when the door 7 is closed with the auxiliary bolt 34 retracted and the latchbolt assembly 28 extended, the deadlocking member 38 will be aligned with the stop 39. A shuttle 40 interacts with the deadlocking member 38 when the latchbolt assembly 28 is retracted by the actuator 17 to move it out of alignment with the stop 39. The deadlocking mechanism 36 is considered to be in an active condition when the deadlocking member 38 is aligned to engage the stop 39, and in an inactive condition when the deadlocking member 38 is moved to avoid engaging the stop 39.

[0038] The actuator 17 forming part of mortice lock assembly 2 according to the invention is operable to move the latchbolt assembly 28 from the extended position to a retracted position (see Figure 4). The actuator assembly may take any form as so as to achieve this function, and Figure 2 is merely illustrative of one preferred form of the actuator 17. The actuator 17 illustrated includes an inner hub 41, and an outer hub 42 (obscured) that are each independently rotatable about the actuator axis XX

(see Figure 1). Each of the inner hub 41 and outer hub 42 include a spindle recess 43 (only the spindle recess of the inner hub 41 is visible in Figure 2) for receiving the inner spindle 15 and outer spindle 16 respectively. Each of the inner hub 41 and outer hub 42 includes an arm portion 44, a free end of which interacts with the latchbolt assembly 28. More specifically, the free end of the arm portion 44 interacts with the shuttle 40 of the detent mechanism 36. Rotation of either the inner hub 41 or outer hub 42 to move the shuttle 46 towards the rear wall 45 of the housing 5 adjusts the deadlocking mechanism to an inactive condition, allowing the latchbolt assembly 28 to move towards the retracted position. The actuator 17 also includes an actuator biasing means 46 which acts against a project portion 47 of the inner hub 41 and outer hub 42. This urgers the inner hub 41 and outer hub 42 against said rotation.

[0039] The mortice lock assembly 2 according to the invention includes a lock means 48 that when in an active condition renders the actuator 17 inoperable. The lock means 48 may take any form in order to achieve this function, and the invention is not limited to the lock means as illustrated. The lock means 48 illustrated includes a slide detent 49, an inner pawl 50 and an outer pawl (not visible in the illustrations). Figure 2 illustrates the lock means 48 in an inactive condition whereby the actuator 17 is operable to move the latchbolt assembly 28 from the extended position. When the lock means 48 is in the inactive condition, inner pawl 50 and/or outer pawl is separated from the actuator. Adjustment of the lock means 48 from the inactive condition, will be described in greater detail by reference to later illustrations.

[0040] The mortice lock assembly 2 according to the invention also includes a selector means 51 that is adjustable for selecting a mode of operation. The selector means may take any form, and will be described in greater detail by reference to later illustrations, however, Figure 2 illustrates a distal end 52 of a selector member 53 forming part of the selector means 51. Furthermore, Figure 2 illustrates the selector means 51 in a normal mode of operation whereby the selector means 51 avoids interacting with the lock means 48 when the latchbolt assembly moves to the retracted position.

[0041] The manner in which the mortice lock 2 operates, or more specifically how the latchbolt assembly 28 is retracted, will now be described with reference to Figures 3, 4 and 5. Referring firstly to Figure 3 which illustrates the latchbolt assembly 28 in

an extended position, with the auxiliary bolt 34 also in the extended position. This retains the deadlatch mechanism 36 in an inactive condition so as to permit retraction of the latchbolt assembly 28 from the extended position. It can also be noted from the Figure 3 that the lock means 48 is in an inactive condition with the slide detent 49 in a raised position relative to the pawl 50. The pawl 50 is illustrated adopting an unlocked condition under the influence of a pawl biasing means 54 which includes a compression spring 55 and follower 56 also acting on the pawl 50. The mortice lock assembly 2 illustrated in Figure 3 may adopt this configuration when, for example, the door 7 (see Figure 1) is in an open position.

[0042] Movement of the door 7 (see Figure 1) to a closed position will result in the mortice lock assembly adopting at least temporarily, the configuration as illustrated in Figure 4. Figure 4 illustrates the latchbolt assembly 28, and auxiliary bolt 34, both moved to a retracted position. It can also be noted from Figure 4 that the distal end 52 of the selector member 53 has moved closer to the slide detent 49, without adjusting the position of the slide detent 49 from the raised position illustrated in Figure 3.

[0043] Figure 5 illustrates the mortice lock assembly with the lock means 48 being adjusted to the active condition. The cam 21 has been rotated to engage and move the slide detent 49 down towards the pawl 50, this causes the pawl 50 to rotate about a pawl shaft 57 when the pawl 50 adopts this position rotation of hub 41 is prevented. It should be understood that the slide detent 49 can cause the outer pawl (not shown) to rotate in a similar manner to the inner pawl 50, preventing rotation of the outer hub 42. Hereinafter the mortice lock will be described by reference to interaction between the slide detent 49 and the inner pawl 50 only however it is to be understood that the interaction can also apply to the outer pawl. It should also be noted from Figure 5 that the lock means 48 can remain in the active condition whilst the latchbolt assembly 28 is in the retracted position. This is achieved as the selector means 51 is operating in the normal mode of operation whereby the distal end 52 of the selector member 53 is not interacting with the slide detent 48 of the lock means.

[0044] The manner in which the mortice lock assembly 2 operates in a holdback mode, or more specifically how the latchbolt assembly 28 is retained in a retracted position, will now be described with reference to Figures 6, 7 and 8. Figure 6

illustrates the latchbolt assembly 28 in the extended position with the selector means adopting the holdback mode of operation. When the selector means 51 is in this mode of operation, the distal end 52 of the selector member 53 is orientated so that a recess 58 formed in the distal end 52 faces in an upward direction. The user will then generally apply end pressure, by a thumb, to the head 29 of the latchbolt assembly 28, causing the latchbolt assembly to move to the retracted position as illustrated in Figure 7. This aligns the recess 58 at the distal end 52 of the selector member 53 with a lug 59 on the slide detent 49. Figure 8 illustrates rotation of the cam 21 to move the slide detent 49 down so the lug 59 locates within the recess 58. This retains the latchbolt assembly 28 in the retracted position. It should also be noted from Figure 8 that the pawl 50 being rotated to a locked position whereby operation of the actuator assembly 17 is prevented. This will retain the inner lever handle 99 and outer lever handle 12 (see Figure 1) in a rigid condition and allow the door 7 to be moved to an open position without having to rotate either lever handle 9, 12.

[0045] It is preferred that when the selector means 51 is in the holdback mode of operation, and the lock means 48 is already in the active condition, that the lug 59 be prevented from locating in the recess 59 inadvertently. This scenario may occur when for example, the lock means 48 is in the active condition and the door 7 moved from an open position to a close position thereby retracting the latchbolt assembly 28. This will be hereinafter described with reference to Figures 9 and 10.

[0046] Figure 9 illustrates the latchbolt assembly 28 in the extended position and the lock means 48 in the active condition, with the selector means 51 still in the holdback mode of operation. This aligns the distal end 52 of the selector member 53 with the lug 59 on the slide detent 49. Referring now to Figure 10 which illustrates the latchbolt assembly 28 moved to the retracted position whereby the distal end 52 of the selector member 53 has engaged and deflected the lug 59. This prevents the lug 59 from locating within the recess 58 in the distal end 52 of the selector member 53, which prevents the latchbolt assembly 28 from being retained in the retracted position. The lug 59 is preferably biased towards the orientation illustrated in Figure 8. This is achieved by a counterbalance arm 60 urging the lug to rotate in the clockwise direction until it engages a wall 87 formed on the slide detent 49. However, this counterbalance arm 60 may be replaced by a torsion spring or the like.

[0047] The manner in which the mortice lock 2 operates when the selector means 51 is in an anti-lockout mode will now be described with reference to Figures 11, 12 and 13. Figure 11 illustrates the distal end 52 of the selector member 53 positioned so a ramp surface 61 thereon is facing the slide detent 49. Figure 11 also illustrates the cam 21 as rotated to drive the slide detent 49 down so the locking means 48 is in an active condition. This causes the pawl 50 to rotate about the pawl shaft 57 so as to prevent operation of the actuator 17. The latchbolt assembly 28 is illustrated in the extended position.

[0048] Referring now to Figure 12 which illustrates partial retraction of the latchbolt assembly 28 so the ramp surface 61 on the distal end 52 of the selector member 53 engages the slide detent 49. The retraction of the latchbolt assembly 28 illustrated in Figure 12 is as a result of the door 7 moving to the closed position, rather than by rotation of the hub 41. Figure 13 illustrates further retraction of the latchbolt assembly 28 so the slide detent 49 slides over the ramp surface 61 of the distal end 52 of the selector member 53. This causes the slide detent 49 to rise so the locking means 48 adopts an inactive condition. This permits the pawl 50 to rotate to the unlocked position under the influence of the pawl biasing means 54 permitting operation of the actuator 17.

[0049] The retraction of the latchbolt assembly 28 may alternatively be as a result of rotation of the inner hub 41 or outer hub 42. The inner pawl 50 can be rotated in a clockwise direction from the position illustrated in Figure 13, to adopt a deactivated position (the outer pawl is also capable of adopting a deactivated position). When the inner (or outer) pawl 50 is in the deactivated position, it is incapable of interacting with the slide detent 49. Accordingly when the inner pawl 50 is in the deactivated condition, the outer pawl may adopt the locked position, so that the outer hub 42 is prevented from rotating while the inner hub 41 is still free to rotate. If the selector means is in the anti-lockout mode rotation of the inner hub 41 will cause the latchbolt assembly 28 to retract, and adjust the condition of the locking means 48 to the inactive condition.

[0050] It should also be noted from Figure 13 that a ball detent 62 associated with the slide detent 49 locates above a ridge 63 formed in the rear wall 45 so as to retain the slide detent 49 in a raised position. This will ensure the slide detent 49 remains in

the raised position even after the latchbolt assembly 28 is returned to the extended position under the influence of the latchbolt biasing means 31. Conversely, the ball detent 62 urges the slide detent 49 to locate in the lowered position illustrated in Figure 12 by locating the ball detent 62 below the ridge 63. It ought to be appreciated that by having the selector means in the anti-lock out mode, this prevents the lock means 48 remaining in the active condition if the door 7 has been moved from an open position to a closed position.

[0051] The selector means 51 according to the invention may take any suitable form provided it can adjust the mode of operation between at least a hold back mode and an anti-lock out mode. A preferred form of selector means is illustrated in Figure 14 associated with the latchbolt assembly 28. The body 30 of the latchbolt assembly 28 is illustrated in its disassembled form to show the body 30 is formed by a frame portion 64 and an insert portion 65. The body 30 is formed from two portions to facilitate assembly of the latchbolt assembly 28, and the features associated therewith. The frame includes a front wall 66 and a rear wall 67 with the front wall 66 having two openings 68, 69 therein. The larger of the two openings 68 receives a stub shaft 70 (obscured by the head 29) associated with the head 29 which permits the head 29 to rotate relative to the frame 64 within that larger opening 68. The smaller opening 69 in the front wall 66 is aligned with a similar small opening 70 in the rear wall 67 which both receive a shaft portion 71 of the selector member 53. A proximal end 72 of the selector member 53 is positioned adjacent the front wall 66 of the frame 64 whilst the distal end 52 of the selector member 53 is positioned adjacent the rear wall 67 of the frame 64 when the mortice lock assembly 2 is assembled. An edge formation 73 on the insert portion 65 is positioned adjacent a neck portion 74 of the shaft 71 so when the insert portion 65 is seated on the frame 64, the selector member 53 is captured with the body of the latchbolt assembly.

[0052] The selector means 51 is preferably configured so as to inhibit rotation of the selector member 53 about the selector axis 22 except for when the mode of operation is being adjusted at the proximal end 72. The selector means 51 may be configured in any suitable form to achieve this function, and Figure 14 illustrates the shaft 71 of the selector member 53 including a ball recess 75 to interact with a ball detent 76 associated with the insert 65. The ball 77 of the ball detent 76 is biased by a compression spring 78 so as to positively seat in the ball recess 75 on the shaft of

the selector member 53 once the selector member 53 has been rotated to the correct position. The ball detent 76 arrangement prevents the likelihood of inadvertent rotation of the selector member 53, and increase the likelihood of an accurate location of the selector member 53 relative to the latchbolt assembly 28. The shaft 71 of the selector member 53 includes three ball recesses 75 which correspond to the selector member 53 being positioned in the hold back mode, anti-lock out mode and normal mode respectively. Furthermore the neck portion 74 covers ¾ of the circumference of the shaft 71, and interacts with the edge formation 73 to limit rotation of the shaft 71 to adopt one of the three modes.

[0053] Figure 14 also illustrates the shuttle 40 and detent member 38 which are both located on the frame 64 of the latchbolt assembly 28. A shuttle biasing means 78 acting between the rear wall 67 of the frame 64 and the shuttle 40 urges the shuttle 40 towards the front wall 66 of the frame 64. Furthermore, a detent biasing means 79 acts between the insert 65 and the detent member 38 towards a top wall 80 of the frame 64.

[0054] Referring now to Figure 15 which illustrates a front elevation view of the mortice lock assembly 2 with the face plate removed. Removal of the face plate allows the head 29 of the latchbolt assembly 28 to rotate relative to the body 30 from a first position whereby the latchbolt assembly 28 is movable relative to the housing, to a second position so as to reveal the proximal end 72 of the selector member 53. It should also be noted that with the head 29 in the second position, movement of the latchbolt assembly 28 to the retracted position is prevented. The proximal end 72 of the selector member 53 has a surface configuration in the form of a groove 81 which can accommodate a driver such as screw driver to facilitate rotation of the selector member 53 relative to the body 30. An alternate surface configuration is clearly possible. The driving surface also includes a marker 82 which can be aligned with the letters A, O or H, representing anti-lock out, normal and holdback modes respectively. Once the selector means 51 has been adjusted to adopt the preferred mode of operation, the head 29 is returned to the vertical orientation and the face plate attached to the front wall 25 of the housing 5. Once the face plate 26 is attached to the front wall 25 of the housing 5, rotation of the head 29 relative to the body 30 is inhibited by the head 29 abutting the face plate 26.

[0055] It ought to be appreciated from the foregoing that the mortice lock assembly 2 as hereinbefore described can be adjusted relatively simply between its modes of operation. This enables the mortice lock assembly 2 to be more adaptable for a range of environments.

[0056] 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 provisional 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 provisional claims at a later date so as to further define or re-define the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A mortice lock assembly for use with a door including a housing, a latchbolt assembly including a head that is movable between an extended position whereby the head extends out from a front wall of the housing and a retracted position whereby the head is substantially retracted into the housing, an actuator assembly that is operable to move the latchbolt assembly from the extended position towards the retracted position, a latchbolt biasing means for biasing the latchbolt assembly towards the extended position, a lock means that is adjustable between an inactive condition and an active condition whereby in an inactive condition the actuator assembly is operable to move the latchbolt assembly from the extended position towards the retracted position and an active condition whereby the actuator is rendered inoperable to move the latchbolt assembly from the extended position towards the retracted position, a selector means adjustable at the front wall for selecting a mode of operation including a hold back mode whereby the latchbolt assembly is retained in the retracted position, an anti-lockout mode whereby movement of the latchbolt assembly to the retracted position prevents the lock means remaining in the active condition.

2. A mortice lock assembly according to claim 1 wherein the latchbolt assembly includes a body with the head attached to the body, the position of the head being adjustable relative to the body between a first position whereby adjustment of the selector means at the front wall is inhibited and a second position whereby the selector means is adjustable to select the mode of operation.

3. A mortice lock assembly according to claim 2 wherein the head is configured relative to the front wall so that when in the first position the latchbolt assembly can move between the extended position and the retracted position, and when the head is in the second position the latchbolt assembly is inhibited from moving between the

extended position and the retracted position.

4. A mortice lock assembly according to claim 3 including a face plate for location adjacent the front wall of the housing, the head being inhibited from adopting the second position when the face plate is located adjacent the front wall of the housing.

5. A mortice lock assembly according to claim 4 wherein the face plate is attachable to housing adjacent the front wall by at least one fastener, the fastener allowing for detachment of the face plate so as to allow adjustment of the head to adopt the second position.

6. A mortice lock assembly according to any one of the preceding claims wherein the selector means includes a selector member that is rotated about a selector axis to adjust the mode of operation.

7. A mortice lock assembly according to claim 6 wherein the selector means is configured so as to inhibit rotation of the selector member about the selector axis.

8. A mortice lock assembly according to claim 7 wherein said configuration includes the selector means having a ball detent and the selector member having an external surface which interacts with the ball detent.

9. A mortice lock assembly according to claim 8 wherein the selector member has an external surface including at least two ball recesses for accommodating the ball detent when the selector means adopts the hold back mode and the anti-lockout mode respectively.

10. A mortice lock assembly according to claim 9 wherein the at least two ball recesses are on opposed sided of the selector member.

11. A mortice lock assembly according to any one of claims 6 to 10 wherein the selector member includes a proximal end having a drive surface configured to facilitate an in use connection to a driver when rotating the selector member.

12. A mortice lock assembly according to any one of claims 6 to 11 wherein the lock means includes a slide detent which moves relative to the housing when adjusting the condition of the lock means between the active condition and an inactive condition, the selector member includes a distal end that is configured to interact with the slide detent when the selector means is operating in the anti-lockout mode or the hold back mode.

13. A mortice lock assembly according to claim 12 wherein the distal end includes a ramp surface that interacts with the slide detent when the lock means is in the active condition and the selector means is in the anti-lockout mode so that movement of the latchbolt assembly to the retracted position adjusts the position of the slide detent.

14. A mortice lock assembly according to claim 12 or 13 wherein slide detent includes a lug that interacts with the distal end of the selector member when the selector means is in the hold back mode and the latchbolt assembly is moved to the retracted position.

15. A mortice lock assembly according to claim 14 wherein the distal end of the selector member includes a recess that interacts with the lug when the selector means is in the hold back mode, so that when the latchbolt is in the retracted position and the lock means is adjusted from the active condition to the inactive condition movement of the latchbolt assembly from the retracted position is inhibited.

16. A mortice lock assembly according to claim 15 wherein the position of the lug relative to the slide detent is adjusted when the lock means is in the active condition and the latchbolt assembly is moved to the retracted position so as to prevent the lug locating in the recess.

17. A mortice lock assembly according to claim 16 wherein the position of the lug is adjustable by pivoting relative to the slide detent between a first position and a second position, the lug being configured to bias towards adopting the first position.

18. A mortice lock assembly according to any one of the preceding claims wherein the selector means is movable with the latchbolt assembly between the extended position and the retracted position.

19. A mortice lock assembly according to any one of the preceding claims wherein the selector means is adjustable to adopt a normal mode of operation.

20. A mortice lock assembly according to claim 19 wherein when the selector means is adjusted to adopt normal mode, the selector means avoids engaging the lock means when the latchbolt assembly moves to the retracted position.