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(54) **NON-HANDED, CONCEALED-SCREW LOCK MOUNTING MECHANISM**

MONTAGEVORRICHTUNG FÜR EIN VERDECKTES LINKS- UND RECHTSHÄNDIGES SCHRAUBSCHLOSS

MECANISME DE MONTAGE D'UNE SERRURE POUVANT S'INSTALLER A DROITE OU A GAUCHE ET COMPORTANT DES VIS DISSIMULEES

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Description

[0001] This invention relates generally to door hardware and more particularly to door locks capable of either-handed installation and having concealed screws on both inside and outside lock portions.

[0002] When selecting door locks, the handing of the door must be considered to avoid upside down or backward mounting of levers or inappropriate mounting of door knobs whose security is compromised by exposed mounting screws. The necessity for considering the myriad combinations possible between door locks of different designs and handing requirements imposed by architectural or occupancy requirements creates a significant cost burden due to inventory requirements, construction delays and correction of errors in installation. These difficulties are well known to persons familiar with door hardware installation during construction or remodelling.

[0003] As typical of the prior art, US-A-4 037 865 discloses a device for mounting door handles on the door, whilst US-A-3 955 387 describes a heavy duty cylindrical lock set adaptable for various functions.

[0004] According to the present invention defined by claim 1, there is provided a door lock comprising two interchangeable handle assemblies, one being an inside handle assembly and the other being an outside handle assembly, each handle assembly including a threaded bore therein, there being an outside chassis having means for engaging the outside handle assembly and means for engaging a bolt drawbar cam, and there being an inside chassis having means for engaging the inside handle assembly and comprising an externally threaded stud for threaded attachment with the inside handle assembly threaded bore and means for engaging a bolt drawbar cam. Such a door lock is known from US-A-3 955 387. The invention is characterised by the features of the characterising portion of claim 1.

[0005] For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, in which the single Figure is an exploded partially sectional elevation view of a door lock mounting mechanism.

[0006] In discussing the present door lock, the terms handle assembly, knob assembly and lever assembly, when used, are interchangeable. They are used in their generic form to refer only to the portion of a door lock which is grasped with the hand to operate the latch mechanism.

[0007] The drawing shows an exploded partially sectional elevation view of a door lock mounting device. The lock, or latch bolt assembly, is not illustrated but it may be any of a commonly available array of such latch bolt mechanisms. Otherwise, the lock includes two identical handle assemblies 10 consisting of knobs 15 which are rotatably captured in respective bushings 20. The method of capture, an "E" ring or other commonly used retaining device, is not illustrated. Each bushing 20 is internally threaded and is itself rotatably captured in a trim ring 100 by a retaining ring, a formed flare or other means used for such rotatable retention applications. Each trim ring 100 is equipped with two or more internally threaded hollow posts projecting into a door cavity. Each bushing 20 has provisions, not illustrated, for application of torque to thread the bushings 20 onto studs 170 of an inside chassis 150, as appropriate. It is clear that the handle assemblies 10 are functionally identical and, so long as the knobs 15 are symmetrical, are interchangeable completely. In the case of levers or other asymmetric handles, actual interchangeability may be limited, although functional interchangeability still applies. It should be noted that the handles 10 are equipped with bores 18, or spindle sockets, having longitudinal teeth, corners or grooves for engaging mating longitudinal features of spindles.

[0008] An outer chassis 50 and the inner chassis 150 have several features in common and several slightly different features. The body of the chassis 50 has two or more holes to accommodate internally threaded posts 30 of the handle assemblies 10. The sleeve 70 projects outwardly from the chassis body and supports an outer spindle 85 which has longitudinal features designed to mesh with the spindle bores 18 of the handle assemblies 10. The outer spindle 85 has an externally cylindrical portion having a bore 82 in which the inner spindle 80 is captured in a driven arrangement. The inner spindle 80 and bore 82 have longitudinal meshing features which constrain the inner spindle 80 and outer spindle 85 to turn together. Biasing means 83 are also included within the bore 82 of the outer spindle 85 to force the inner spindle 80 to an extended position. The inner spindle 80 is captured within the bore 82 by staking or other common means which is not illustrated. Both spindles 80 and 180 are for engaging a bolt drawbar cam (not shown).

[0009] The inside chassis 150 is substantially identical to the outside chassis 50 with a few important exceptions. Mounting legs 130 are spaced to mate with the internally threaded posts 30 of the knob assemblies 10. When inserted in the door cavity and aligned with the outside chassis 50, the mounting legs 130 register with the internally threaded posts 30 such that the posts 30 fit smoothly within alignment bores 165 in the mounting legs 130. Mounting screws 160 are inserted from the inside surface of the inside chassis 150 through the mounting legs 130 into engagement with the threads of the posts 30, and when securely tightened, hold the inside chassis 150, outside chassis 50 and knob assembly 10 in securely fixed relationship with each other. The posts 30 extend through holes in the outside chassis 50 into the alignment bores 165 in a telescopic arrangement which permits adjustment for doors of varying thicknesses. The mounting legs 130 also have recesses 168 behind the heads of the mounting screws 160. These recesses accommodate the posts 30 of the knob assembly 10 when the knob assembly is mounted on

the inside of the door. Spindles 180 and 185 have the same relationship by means of spindle bore 182 and spindle bias 83 as has been described for the spindle couple of the outside chassis 50. The stud 170 supports the spindle 185 in its bore while the external threads provide connection capability with the bushing 20 of the adjacent handle assembly 10. This connection capability is a key feature in that it permits attachment of either of the functionally identical handle assemblies 10 to the inside chassis 150 and, by simply reversing the positions of the inside chassis 150 and outside chassis 50, the handing of the door can be changed or accommodated. Note that the sleeve 70 of the outside chassis 50 has no external threads and therefore will not engage the internal threads of the bushing 20. Thus, after installation, the outside handle assembly 10 presents no access to either the mounting screws 160 or to the mounting stud 170. Note also that the internally threaded posts 30 of the inside handle assembly 10 telescope smoothly into the recesses 168 of the mounting legs 130 when the handle assembly is finally attached to the inside chassis 150 by means of the stud 170.

[0010] The door lock is pictured with two mounting posts and two mounting legs but may, of course, be provided with three or more legs. Size, weight and strength requirements of the installation will ultimately determine the number of mounting legs required.

Claims

1. A door lock comprising two interchangeable handle assemblies (10), one being an inside handle assembly and the other being an outside handle assembly, each handle assembly including a threaded bore (18) therein, there being an outside chassis (50) having means (85) for engaging the outside handle assembly (10) and means (80) for engaging a bolt drawbar cam, and there being an inside chassis (150) having means (185) for engaging the inside handle assembly (10) and comprising an externally threaded stud (170) for threaded attachment with the inside handle assembly threaded bore (18) and means for engaging a bolt drawbar cam; characterised in that each handle assembly includes a plurality of axially extending internally threaded posts (30) thereon, and the outside chassis (50) includes a plurality of axially extending bores therethrough and an unthreaded sleeve (85) extending therefrom into the outside handle assembly threaded bore (18), the inside chassis (150) having means for attaching the outside handle assembly with concealed screws (160), the means for engaging the outside handle assembly comprising a plurality of axially extending mounting legs (130) containing the concealed screws (160), the outside handle assembly threaded posts (30) passing through the bores of the outside chassis (50) and engaging the concealed screws and telescopically nesting within the mounting legs (130).

2. A door lock according to claim 1, wherein the means, in the inside and outside chassis (50, 150), for engaging the bolt drawbar cam comprises an axially fixed outer spindle (85, 185), the outer spindle having a non-cylindrical axial bore (82, 182) in its inward end, the bore containing an congruently-shaped captured inner spindle (80, 180) projecting a sufficient distance to engage a bolt drawbar cam of a door latch bolt assembly.

3. A door lock according to claim 2, wherein the interchangeable handle assemblies contain axially extending spindle bores, said spindle bores having longitudinal features which intermesh with congruent longitudinal features of the outer spindles (85, 185).

Patentansprüche

1. Türschloß mit zwei austauschbaren Handgriffanordnungen (10), von denen eine eine innere Handgriffanordnung und die andere eine äußere Handgriffanordnung ist, wobei jede Handgriffanordnung eine darin angeordnete, mit Gewinde versehene Bohrung (18) aufweist, mit einem äußeren Chassis (50) mit einer Einrichtung (85) zur Verbindung mit der äußeren Handgriffanordnung (10) und einer Einrichtung (80) zur Verbindung mit einem Bolzendrehnocken und mit einem inneren Chassis (150) mit einer Einrichtung (185) zur Verbindung mit der inneren Handgriffanordnung (10) und mit einem mit Außengewinde versehenem Bolzen (170) für eine Schraubverbindung mit der mit Gewindebohrung (18) Versehenen inneren Handgriffanordnung und einer Einrichtung zur Verbindung mit einem Drehbolzenstift, dadurch gekennzeichnet, daß jede Handgriffanordnung eine Vielzahl sich axial erstrekkender, mit Innengewinde versehener, darauf angeordneter Säulchen (30) aufweist, und daß das äußere Chassis (50) eine Vielzahl sich axial erstrekkender, dort hindurchgehender Bohrungen und eine nicht mit Gewinde versehene Buchse (85) aufweist, die sich von dort in die mit Gewinde versehene Bohrung (18) der äußeren Handgriffanordnung erstreckt, wobei das innere Chassis (150) eine Einrichtung zum Befestigen der äußeren Handgriffanordnung mit verdeckten Schrauben (160) aufweist, wobei die Einrichtung zum Verbinden der äußeren Handgriffanordnung eine Vielzahl sich axial erstrekkender Montagefüße (130) aufweist, die die verdeckten Schrauben (160) aufnehmen, wobei die mit Gewinde versehenen Säulchen (30) der äußeren Handgriffanordnung durch die Bohrungen des äußeren Chassis (50) hindurchgehen und mit den ver-

deckten Schrauben in Kontakt kommen und sich teleskopartig innerhalb der Montagefüße (130) einfügen.

2. Türschloß nach Anspruch 1, bei dem die Einrichtung im inneren und äußeren Chassis (50, 150) zur Verbindung mit dem Bolzendrehstift eine axial fixierte äußere Spindel (85, 185) aufweist, wobei die äußere Spindel eine nicht-zylindrische axiale Bohrung (82, 182) in ihrem inneren Ende aufweist, wobei die Bohrung eine kongruent ausgeformte, festgehaltene innere Spindel (80, 180) aufnimmt, die eine ausreichende Strecke weit hervorragt, um mit einem Bolzendrehnocken einer Türrastbolzenanordnung in Eingriff zu kommen.

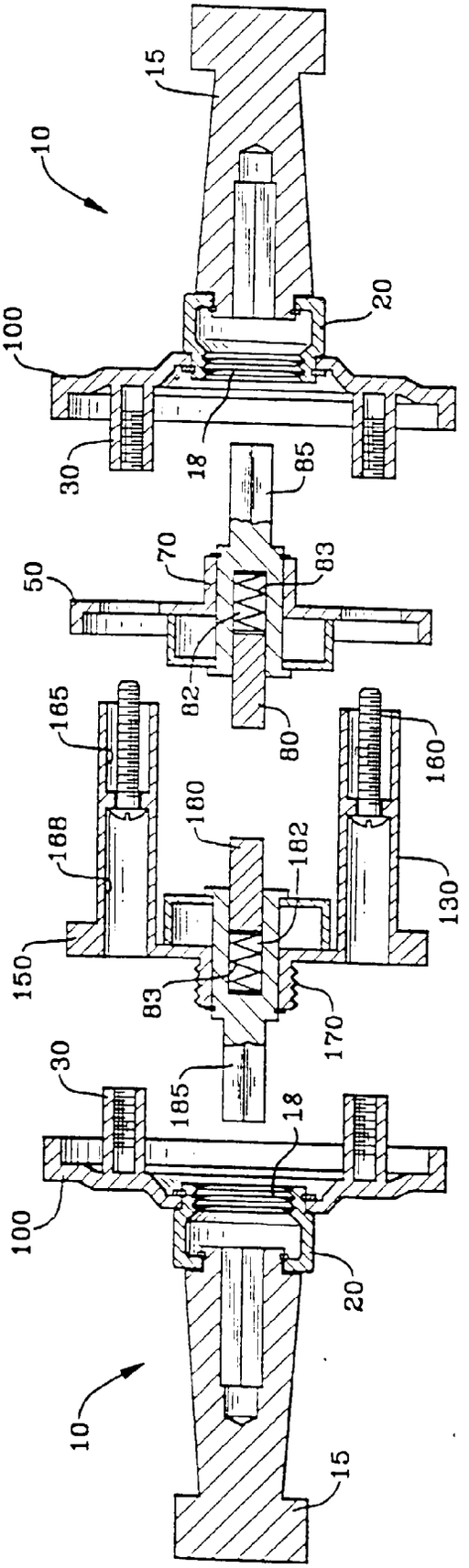
3. Türschloß nach Anspruch 2, bei dem die austauschbaren Handgriffanordnungen sich axial erstreckende Spindelbohrungen aufweisen, wobei die Spindelbohrungen längliche Ausformungen haben, die mit kongruenten länglichen Ausformungen der äußeren Spindeln (85, 185) kämmen.

Revendications

1. Serrure de porte comportant deux ensembles de poignée interchangeables (10), l'un étant un ensemble de poignée intérieure et l'autre étant un ensemble de poignée extérieure, chaque ensemble de poignée comprenant un alésage fileté (18), avec un châssis extérieur (50) ayant des moyens (85) destinés à engager l'ensemble de poignée extérieure (10) et des moyens (80) destinés à engager une came de barre de traction de verrou, et avec un châssis intérieur (150) ayant des moyens (185) destinés à engager l'ensemble de poignée intérieure (10) et comportant un goujon fileté extérieurement (170) pour une liaison filetée avec l'alésage fileté d'ensemble de poignée intérieure (18) et des moyens destinés à engager une came de barre de traction de verrou; caractérisée en ce que chaque ensemble de poignée comprend une multiplicité de fiches filetées intérieurement s'étendant axialement (30), et le châssis extérieur (50) comprend une multiplicité d'alésages s'étendant axialement à travers et une douille non filetée (85) s'étendant depuis celui-ci dans l'alésage fileté d'ensemble de poignée extérieure (18), le châssis intérieur (150) ayant des moyens destinés à fixer l'ensemble de poignée extérieure avec des vis cachées (160), les moyens destinés à engager l'ensemble de poignée extérieure comportant une multiplicité de pattes de montage s'étendant axialement (130) contenant les vis cachées (160), les fiches filetées d'ensemble de poignée extérieure (30) passant à travers les alésages du châssis extérieur (50) et engageant les vis cachées et se logeant de manière télescopique dans les pattes de montage (130).

2. Serrure de porte selon la revendication 1, dans laquelle les moyens, dans les châssis intérieur et extérieur (50, 150), destinés à engager la came de barre de traction de verrou comportent un axe externe fixé axialement (85, 185), l'axe externe ayant un alésage axial non-cylindrique (82, 182) dans son extrémité intérieure, l'alésage contenant un axe intérieur retenu de forme correspondante (80, 180) qui dépasse d'une distance suffisante pour engager une came de barre de traction de verrou d'un ensemble de verrou de porte.

3. Serrure de porte selon la revendication 2, dans laquelle les ensembles de poignée interchangeables contiennent des alésages d'axe s'étendant axialement, lesdits alésages d'axe ayant des caractéristiques longitudinales qui s'engagent avec des caractéristiques longitudinales correspondantes des axes externes (85, 185).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