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(72) Inventor: **Cowper, Brian**
New Malden, Surrey KT3 3HP (GB)

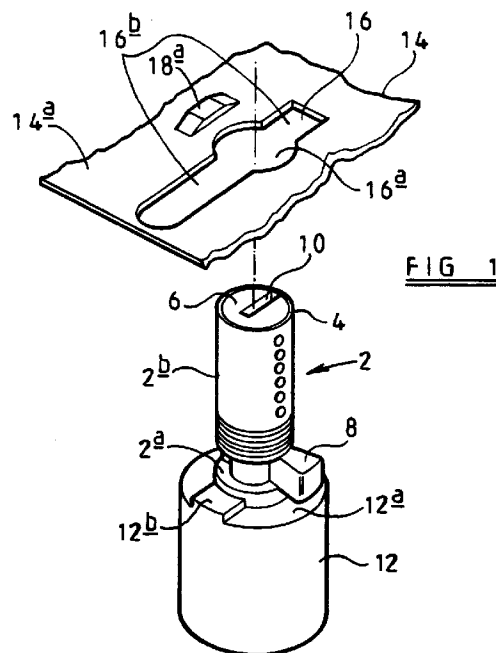
(74) Representative: **Prutton, Roger**
MARKS & CLERK,
Alpha Tower,
Suffolk Street Queensway
Birmingham B1 1TT (GB)

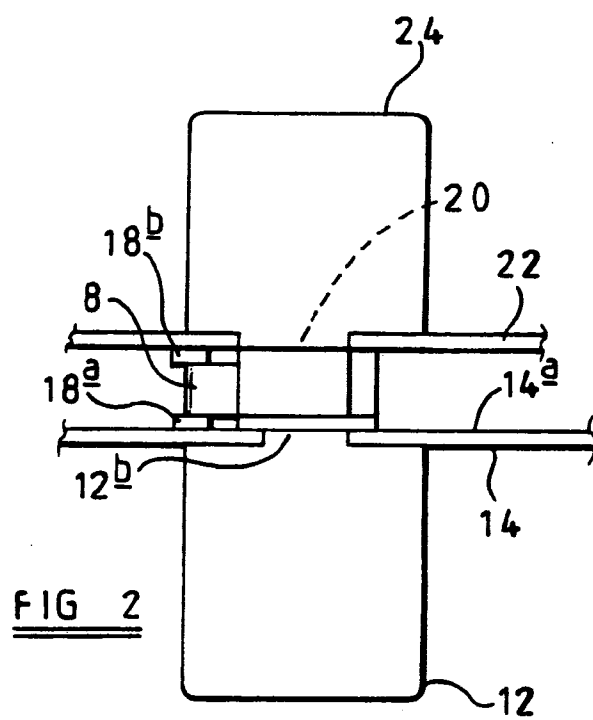
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(71) Applicant: **Cowper, Brian**
New Malden, Surrey KT3 3HP (GB)

(54) **Lock**

(57) A lock comprises a body having first (14) and second (22) opposite side plates each having an orifice (16, 20) therein so as to form a passage therebetween. A cylindrical lock cylinder (2) passes through the passage and is driveably connected with a rotatable cam (8). A bolt member is mounted for movement relative to the body and is moveable by the cam (8). The lock cylinder (2) is received by first and second close-fitting sleeves (12, 24) which are secured thereto, the second sleeve (24) being removably secured, such that an inner end of each of the first and second sleeves (12, 24) abuts the first and second side plates (14, 22) respectively, so as to prevent axial movement of the lock cylinder (2). The first sleeve (12) has at least one projection (12b) on its inner end (12a) which is received in the orifice (16) of the first side plate (14) and is a close fit therein, so as to substantially prevent rotation of the first sleeve (12). The first side plate (14) has an upstanding ridge (18a) on an inner face (14a), which is located such that when the lock is in the locked position it is adjacent the cam (8) and sufficiently limits axial movement of the lock cylinder (2) that the at least one projection (12b) on the first sleeve (12) is not completely disengageable from the orifice (16) in the first side plate (14) even when the second sleeve (24) is removed, whereas when the lock is in an open position such axial movement is not limited by the ridge (18a) (Fig 2).

**FIG 1****EP 0 892 129 A2**



Description

The present invention relates to an improvement in the design of locks. More specifically, the present invention is concerned with improvements in the assembly and security of lock components.

The lock cylinder of a conventional pin-tumbler lock is cylindrical with a radially extending lobe along the length of the cylinder. Opposite side plates on the lock are provided with matching orifices such that the lock cylinder may be mounted in a passage therebetween. The cylinder is usually secured to the body of the lock by a bolt which passes through the face plate of the lock and the lobe of the cylinder, transversely to the cylinder.

It is an object of the present invention to provide a lock which is easy to mount and disassemble, but which is resistant to disassembly when, in use, the lock is in a locked position.

According to the present invention, there is provided a lock comprising a body having first and second opposite side plates each having an orifice therein so as to form a passage therebetween, a cylindrical lock cylinder passing through said passage and driveably connected with a rotatable cam, a bolt member mounted for movement relative to the body and moveable by said cam, said lock cylinder received by first and second close-fitting sleeves which are secured thereto, said second sleeve being removably secured, such that an inner end of each of said first and second sleeves abuts the first and second side plates respectively so as to prevent axial movement of the lock cylinder, wherein the first sleeve has at least one projection on its inner end which is received in the orifice of the first side plate and is a close fit therein so as to substantially prevent rotation of the first sleeve, and wherein the first side plate has an upstanding ridge on an inner face, said ridge located such that when the lock is in the locked position it is adjacent the cam and sufficiently limits axial movement of the lock cylinder that the at least one projection on the first sleeve is not completely disengageable from the orifice in the first side plate even when the second sleeve is removed, whereas when the lock is in an open position such axial movement is not limited by said ridge.

Advantageously, such a lock is easily assembled. A free end of the lock cylinder having the first sleeve and cam attached thereto is passed through the first side plate until the cam is inside the body and the at least one projection on the first sleeve is located in the orifice in the first side plate. The second sleeve is then mounted on the free end of the lock cylinder. Disassembly is merely the reverse process. However, when the lock is in its locked position, axial and rotational movement of the lock cylinder is prevented.

Preferably, when the lock is in the locked position, the cam abuts the ridge on the first side plate such that no axial movement of the lock cylinder is possible.

Preferably, a corresponding ridge is provided on an

inner face of the second side plate, in alignment with the ridge on the inner face of the first side plate. Thus, in use, the lock cylinder is securely fixed in the locked position irrespective of the orientation of the lock cylinder (i.e. the first sleeve abutting the first side plate or the second side plate).

Preferably, the second sleeve is in screw-threaded engagement with the lock cylinder.

Preferably, the first sleeve is provided with at least two projections on its inner end.

Advantageously, it is also difficult to forcibly remove the locking cylinder. Hammering of the sleeves will be ineffective since the force will be absorbed by one of the side plates. Attempts to punch out the lock cylinder itself would be difficult since the attachment between the lock cylinder and first sleeve (or second sleeve) would have to be broken as would the connection between the lock cylinder and the cam.

Preferably, the lock is provided with deadlocking means. More preferably, said deadlocking means is effective when the lock is in a locked and unlocked position. Most preferably, said deadlocking means is as described in copending British Application No. 9715113.8.

The lock may be provided with means to increase the throw of the bolt. Preferably, such means are as described in copending British Application No. 9715113.8.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings in which,

Fig 1 is a perspective view of part of a lock cylinder assembly and side plate, and

Fig 2 is a plan view of a mounted lock cylinder assembly.

Referring to Fig 1, a lock cylinder 2 is of the pin tumbler type more fully described in copending British Application No. 9715114.6. The lock cylinder 2 comprises a stator 4 and a rotor 6, the latter being mechanically coupled to a cam 8 and having an axially extending keyway 10 therein. A first end 2a of the locking cylinder 2 is received by and is a close sliding fit with a first tubular sleeve 12. At an end 12a adjacent the cam 8, the first sleeve 12 is provided with a pair of diametrically opposed projections 12b (only one shown). A first side plate 14 (shown in part) forming part of a lock body has an elongate orifice 16 therein, which is capable of receiving a second end 2b of the locking cylinder 2 which is part screw-threaded, the cam 8 and the projections 12b on the first sleeve 12. A region 16a of the orifice 16 has a part circular boundary which corresponds to the circumference of the locking cylinder 2, such that when in place, lateral movement of the locking cylinder 2 is prevented. Regions 16b of the orifice 16 corresponding in shape to the projections 12b on the first sleeve 12 prevent rotation of the locking cylinder 2 when in place. Adjacent the orifice 16 on an inner face 14a of the side plate 14 there is an upstanding ridge 18a.

To assemble the lock cylinder 2 in the lock body, the second end 2b of the lock cylinder 2 is inserted through the orifice 16 in the first side plate 14 until the cam 8 has passed through the orifice 16 and the second end 2b protrudes through a corresponding orifice 20 (Fig 2) in a second side plate 22 (Fig 2). The lock cylinder 2 is then rotated until the cam 8 is correctly positioned (the cam 8 is directly or indirectly engageable with a bolt member, not shown) and the projections 12b on the first sleeve 12 are located in the orifice 16 in the first side plate 14. A second sleeve 24 (Fig 2) is mounted on the second end 2b of the lock cylinder 2 and engaged with the screw thread until it abuts the second side plate 22.

Referring to Fig 2, the lock is in a locked position and the cam 8 abuts the upstanding ridge 18 on the inner face 14a of the first side plate 14 (shown in part) and a corresponding upstanding ridge 18b on an inner face 22a of the second side plate 22 (shown in part). It will be apparent that even if the second sleeve 24 is accessible and removed, the lock cylinder 2 is firmly anchored in place. For the lock cylinder 2 to be removed, there must be sufficient scope for axial movement of the lock cylinder 2 to disengage the projections 12b on the first sleeve 12 from the orifice 16 in the first side plate 14 so that the lock cylinder 2 may be rotated until the cam 8 is in the correct orientation to be withdrawn through the orifice 16. No such axial movement is possible due to the abutment of the cam 8 with the upstanding ridge 18a.

Thus, a lock is provided which is highly resistant to unauthorised removal of the lock cylinder 2 when the lock is in its locked position, yet which allows easy assembly and disassembly when required, for example for maintenance or replacement of the lock cylinder 2.

Claims

1. A lock comprising a body having first (14) and second (22) opposite side plates each having an orifice (16, 20) therein so as to form a passage therebetween, a cylindrical lock cylinder (2) passing through said passage and driveably connected with a rotatable cam (8), a bolt member mounted for movement relative to the body and moveable by said cam (8), said lock cylinder (2) received by first (12) and second (24) close-fitting sleeves which are secured thereto, said second sleeve (24) being removably secured, such that an inner end of each of said first (12) and second (24) sleeves abuts the first (14) and second (22) side plates respectively so as to prevent axial movement of the lock cylinder (2), wherein the first sleeve (12) has at least one projection (12b) on its inner end (12a) which is received in the orifice (16) of the first side plate (14) and is a close fit therein so as to substantially prevent rotation of the first sleeve (12), and wherein the first side plate (14) has an upstanding ridge (18a) on an inner face (14a), said ridge (18a) located such that when

the lock is in the locked position it is adjacent the cam (8) and sufficiently limits axial movement of the lock cylinder (2) that the at least one projection (12b) on the first sleeve (12) is not completely disengageable from the orifice (16) in the first side plate (14) even when the second sleeve (24) is removed, whereas when the lock is in an open position such axial movement is not limited by said ridge (18a).

2. A lock in accordance with Claim 1, characterised in that when the lock is in the locked position, the cam (8) abuts the ridge (18a) on the first side plate (14) such that no axial movement of the lock cylinder (2) is possible.
3. A lock in accordance with Claim 1 or 2, characterised in that a corresponding ridge (18b) is provided on an inner face (22a) of the second side plate (22), in alignment with the ridge (18a) on the inner face (14a) of the first side plate (14).
4. A lock in accordance with any preceding claim, characterised in that the second sleeve (24) is in screw-threaded engagement with the lock cylinder (2).
5. A lock in accordance with any preceding claim, characterised in that the first sleeve (12) is provided with at least two projections (12b) on its inner end (12a).
6. A lock in accordance with any preceding claim, characterised in that the lock is provided with deadlocking means.
7. A lock in accordance with any preceding claim, characterised in that said deadlocking means is effective when the lock is in a locked and unlocked position.
8. A lock in accordance with any preceding claim, characterised in that the lock is provided with means to increase the throw of the bolt member.

