



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.04.2016 Bulletin 2016/17

(51) Int Cl.:
E05B 17/20 (2006.01) **E05B 9/04** (2006.01)
E05B 17/00 (2006.01) **E05B 17/04** (2006.01)

(21) Application number: **15020196.0**

(22) Date of filing: **20.10.2015**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(72) Inventors:
• **Southall, Ian**
Warwickshire, DY11 5XE (GB)
• **Avill, John Edward**
Sheffield, S30 2DG (GB)

(74) Representative: **Johnson, Terence Leslie**
Hurst Cottage
Sutton
Pulborough, West Sussex RH20 1PL (GB)

(30) Priority: **24.10.2014 GB 201418941**

(71) Applicant: **K I J Security Locks Limited**
Chapeltown S35 2PH (GB)

(54) **A LOCK**

(57) The invention relates to a lock apparatus for mounting on a closure having internal and external faces, comprising a body (2) defining a cylindrical bore (3) and having internal and external (in use) spaced cylinder parts (4,5) mounting therebetween a rotatable cam (6) having a bore (7) aligned with the cylindrical bore (3) and

adapted for operating a locking mechanism of a closure, characterised by stop means (7a) associated with the cam (6) and the internal cylinder part (4) whereby to obviate operation of the lock apparatus (1) when the lock apparatus is vandalised.

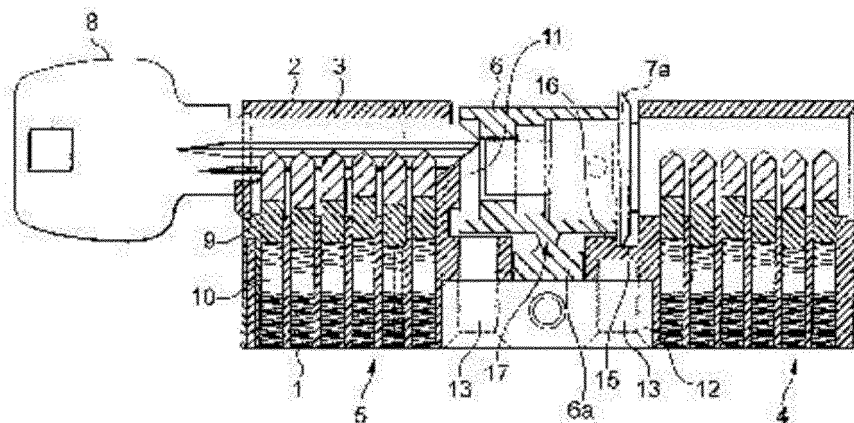


Fig. 1

Description

[0001] The invention relates to a lock, and particularly to a lock for mounting on a closure and for operating a locking mechanism of the closure. Such a lock is that often known as a Euro Cylinder or Euro profile cylinder lock.

[0002] Such Euro Cylinder locks usually have a cylinder in which a rotatable barrel is mounted and which can be turned to and from an open, unlocked, and closed, locked position by a key which operates key pins to move spring-loaded driver pins to a shear line defining a boundary between the barrel and cylinder so that the barrel can be rotated on turning the key. There is also a cam secured to the barrel having a part which operates the locking mechanism of the closure. When the barrel rotates, so does the cam so that the cam part operates the locking mechanism. However, the Euro Cylinder lock has an inherent weak point, namely at a cut out seating area near the centre of the cylinder in which the cam is seated. If the lock is vandalised in the locked position by snapping off or bending a part of the cylinder which is at or on an external or exterior face of the closure owing to this weak point, the cam can be exposed whereby the locking mechanism is operable to unlock the closure, so a perpetrator can gain unlawful entry to a property on which the closure is mounted.

[0003] It is an object of the invention to seek to obviate this disadvantage.

[0004] According to a first aspect of the invention there is provided a lock apparatus for mounting on a closure having internal and external faces, comprising a body defining a cylindrical bore and having internal and external (in use) spaced cylinder parts mounting therebetween a rotatable cam having a bore aligned with the cylindrical bore and adapted for operating a locking mechanism of a closure, and stop means associated with the cam and an internal cylinder part whereby to obviate operation of the lock apparatus when the lock apparatus is vandalised.

[0005] Using the invention, it is possible to allow the external cylinder part to be broken off or bent out of alignment during an act of vandalism, while preventing opening of a closure to which the lock apparatus is fitted.

[0006] Preferably, the stop means may comprise a detent carried by an internal part of the cam, that is a part of the cam adjacent the internal cylinder part, as considered in use, of the body. This provides a relatively simple but effective means of preventing access to the internal parts of the lock apparatus.

[0007] The detent may suitably comprise a raised profile on the internal part of the cam. Such a profile can be readily formed as by machining.

[0008] In a preferred embodiment, the raised profile may comprise a raised peripheral edge or flange on the cam.

[0009] The locking apparatus may also comprise an area of weakness of a part of the cam adapted for oper-

ating the locking mechanism.

[0010] The area of weakness may comprise an area of reduced thickness of the said part of the cam. This area of reduced thickness can reduce the effect of applying a lever or other tool to the cam in an attempt to rotate it by breaking the said part off the remainder of the cam.

[0011] According to a second aspect of the invention, there is provided a closure fitted with lock apparatus as hereinbefore defined.

[0012] Lock apparatus embodying the invention is hereinafter described, by way of example, with reference to the accompanying drawings.

[0013] Fig. 1 is a schematic side elevational sectional view of a cylinder lock of the apparatus embodying the invention; and

[0014] Fig. 2 is a schematic side elevational view of a cam used in the lock apparatus of Fig. 1.

[0015] Referring to the drawings there is shown a lock apparatus 1 for mounting on a closure (not shown) having internal and external faces, comprising a cylinder or body 2 defining a cylindrical bore 3 and having internal and external (in use) spaced cylinder parts 4, 5 mounting therebetween a rotatable cam 6 having a bore 7 aligned with the cylindrical bore 3 and operable to operate via a driver 6a a locking mechanism (not shown) of a closure, and stop means 7a associated with the cam 6 and the internal cylinder part whereby to seek to obviate operation of the lock apparatus when that apparatus is vandalised.

[0016] The lock apparatus 1 shown in the drawings is a so-called Euro cylinder lock which has a bulbous body or cylinder and is mountable on a closure such as a uPVC door, an Aluminium double-glazed door, and/or a composite or timber door. The locking mechanism is operated by the cam 6 of the lock apparatus 1 to effect opening and locking of the mechanism and hence of the closure.

[0017] As will be known, the lock apparatus 1 is key-operated by a customised key 8 which on insertion in a key-hole in a plug of the external cylinder part 5 from externally of the closure aligns key pins 9 and spring-loaded driver pins 10 along a shear line between the plug and external cylinder part 5 so that the plug and thus the cam 6 can be rotated by the key 8 to open (unlock) or lock the closure, the part 6a of the cam 6 engaging co-operating parts of the locking mechanism for locking and unlocking the closure. The key 8 enters the bore 7 of the cam 6 and actuates a cam drive 11 for effecting rotation of the cam to open or lock the closure by operation of the locking mechanism. The lock apparatus 1 is mounted on the closure so that the one part 5 of the body 2 is accessible from the external side of the closure, the other, internal, part 4 being accessible from the internal side of the closure, i.e. from within a room a doorway of which is accessed via the closure. The cam 6 and a seating for it between the cylinder parts 4, 5 are it will be understood essentially situated internally of the closure with the locking mechanism.

[0018] As stated above, the assembled lock apparatus

1 is, in use, mounted on a closure with the internal cylinder part 4 accessible from, for example, inside a room in which the closure is installed, the external cylinder part 5 being accessible from externally of the room.

[0019] If the lock apparatus 1 is vandalised, or an attempt is made to vandalise it, the external cylinder part 5 is generally broken off, and the external cylinder part 5 and plug and the external cam drive 11 fall off. As shown, the locking apparatus 1 includes a circumferential rebate 15 on the internal cylinder part 4, the rebate being defined at the external side of the lock apparatus by a stop in the form of an upstanding wall 16. The detent or peripheral flange 7a engages in the rebate 15 and is adapted to butt up against the upstanding wall 16. If the lock apparatus 1 is vandalised and the external cylinder part 5 is broken off, the cam 6 is prevented from being withdrawn to the exterior of the closure (to the left as viewed in Fig.1) by the engagement of the detent 7a and upstanding wall 16. Stated in another way, the detent 7a being positioned on the internal part or side 4 of the cylinder provides that in this position it is protected from tampering from the exterior and prevents the cam 6 being withdrawn through the lock apparatus 1 from the exterior (external side of the door).

[0020] Moreover, the detent 7a being on the side of the cam 6 facing the internal cylinder lock part 4 and having at least the same diameter thereas is active to prevent the cam 6 being pushed through the internal cylinder part 4 so preventing tampering with the locking mechanism of the closure.

[0021] The cam 6 has an area of reduced thickness 17 adjacent the driver 6a. Should the cam 6 be exposed if the lock apparatus is vandalised, the driver 6a can be broken off at the area 17 if an attempt to rotate it is made using shears, pliers, bolt cutters or the like. The locking mechanism of the closure is thus protected against unauthorised operation.

[0022] The lock apparatus 1 is also provided with a strengthening member or link 12 made for example of hardened steel which strengthens the cylinder 2 and maintains the internal cylinder part 4 in position should the lock apparatus be vandalised by snapping off or bending the external cylinder part 5. The link 12 is held in position by bolts 13 inserted in suitably provided holes or bores.

[0023] To facilitate such snapping off or bending in a 'clean' manner, the external cylinder part 5 can be provided with an optional zone of weakness in the form of a slot suitably 1mm in lateral extent, which permits sacrificial breaking off of at least a section of the external cylinder part when the lock apparatus 1 is being vandalised, for example when it is attacked by a bolt cutter or monkey wrench.

[0024] It will be understood that the lock apparatus 1 can be key-operated by a key from both exteriorly and interiorly of the closure. Alternatively, the lock apparatus 1 may be operated by a key 8 on the external side of the closure, and by a turn- or thumb screw on the internal

side of the closure.

[0025] The lock apparatus 1 may be made of any suitable material, preferably metal such as brass, which may be hardened by heat treatment. The relative dimensions of the lock apparatus shown in Fig.1 of the drawings are such as might be adopted in a particular embodiment.

[0026] The lock apparatus 1 described hereinbefore with reference to the drawings is thus resistant to being vandalised.

Claims

1. A lock apparatus for mounting on a closure having internal and external faces, comprising a body (2) defining a cylindrical bore (3) and having internal and external (in use) spaced cylinder parts (4,5) mounting therebetween a rotatable cam (6) having a bore (7) aligned with the cylindrical bore (3) and adapted for operating a locking mechanism of a closure, **characterised by** stop means (7a) associated with the cam (6) and the internal cylinder part (4) whereby to obviate operation of the lock apparatus (1) when the lock apparatus is vandalised.
2. A lock apparatus according to Claim 1, **characterised by** the stop means (7a) being mounted externally of the cam (6).
3. A lock apparatus according to Claim 2, **characterised by** the stop means (7a) comprising a detent carried by a part of the cam (6) adjacent the internal cylinder part (4) of the lock apparatus (1).
4. A lock apparatus according to Claim 3, **characterised by** the detent (7a) comprising a raised profile on a body (2) of the cam (6).
5. A lock apparatus according to Claim 4, **characterised by** the raised profile (7a) comprising a raised peripheral flange or edge on a part of the cam (6) adjacent the internal cylinder part (4).
6. A lock apparatus according to any preceding Claim, **characterised in that** there is a rebate (15), **in that** the rebate (15) is part of the internal cylinder part (4), and **in that** the stop means (7a) is received in the rebate (15).
7. A lock apparatus according to Claim 6, **characterised by** the rebate (15) being defined by a stop (16) at a side of the internal cylinder part (4) facing the exterior side of the closure in use.
8. A lock apparatus according to any preceding Claim, **characterised by** an area of weakness (17) of the cam (6).

9. A lock apparatus according to Claim 8, **characterised by** the area of weakness (17) comprising a part (6a) of the cam (6).
10. A lock apparatus according to Claim 9, **characterised by** the area of weakness (17) comprising an area of reduced thickness of the said part (6a) of the cam (6). 5
11. A lock apparatus according to any preceding claim, **characterised by** a strengthening member (12) which is secured to the body to the body (2) to maintain the position of the internal cylinder part (4) when the lock apparatus (1) is vandalised. 10
12. A closure fitted with lock apparatus according to any preceding claim. 15

20

25

30

35

40

45

50

55

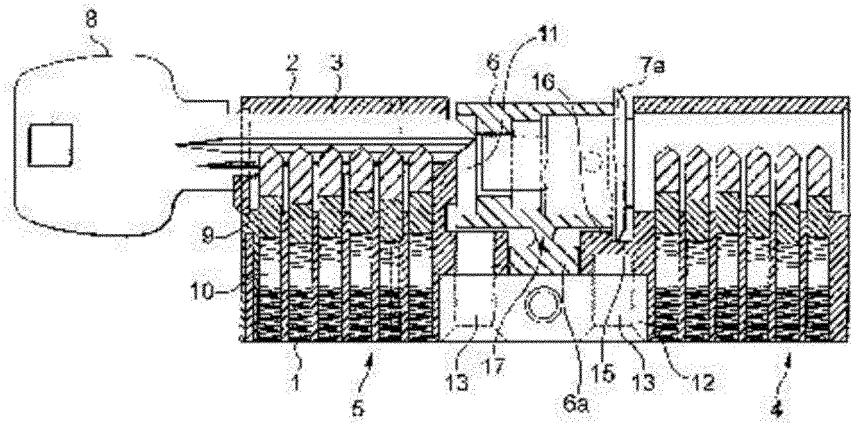


FIG. 1

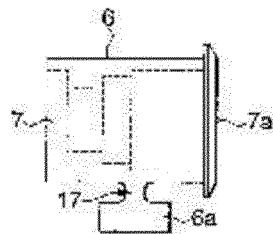


FIG. 2



EUROPEAN SEARCH REPORT

Application Number
EP 15 02 0196

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 491 585 A (BELCHER CHRISTOPHER ERIC [GB]; UAP LTD [GB]) 12 December 2012 (2012-12-12)	1-5,12	INV. E05B17/20 E05B9/04 E05B17/00 E05B17/04
A	* page 5, line 6 - page 7, line 15 * * page 11, line 12 - page 11, line 15 * * figures 1-17 *	6-11	
X	EP 0 736 653 A2 (KELLER ERNST [CH]) 9 October 1996 (1996-10-09)	1-7,11, 12	
A	* column 2, line 6 - line 13 * * column 2, line 38 - line 55 * * column 3, line 10 - line 15 * * figures 1-8 *	8-10	
X	EP 2 466 039 A2 (TALLERES ESCORIAZA SA [ES]) 20 June 2012 (2012-06-20)	1,2, 6-10,12	
A	* paragraph [0041] - paragraph [0043] * * paragraph [0047] * * figures 1-13 *	3-5,11	
X,P	GB 2 518 496 A (K I J SECURITY LOCKS LTD [GB]) 25 March 2015 (2015-03-25)	1-5,8-12	TECHNICAL FIELDS SEARCHED (IPC)
A,P	* page 5, line 24 - page 6, line 7 * * page 6, line 26 - page 8, line 13 * * figures 1-6 *	6,7	E05B E05C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 March 2016	Examiner Antonov, Ventseslav
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 02 0196

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-03-2016

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2491585	A	12-12-2012	NONE
EP 0736653	A2	09-10-1996	AT 192206 T 15-05-2000 DE 59605022 D1 31-05-2000 EP 0736653 A2 09-10-1996 ES 2147909 T3 01-10-2000
EP 2466039	A2	20-06-2012	NONE
GB 2518496	A	25-03-2015	NONE

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82