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(54) **Locks**

(57) The invention relates to a cylinder lock 1, comprising a cylinder 2 having a part 3 of a hardness which is relatively increased as compared to other parts of the lock 1. In the embodiment the part 3 is the first, as considered in a direction away from a front face 8 of the lock 1, of a row of differ pins 3, 4, 5, 6, 7, the first differ pin 3 being made of a hardened steel such as an iron-carbon steel having a eutectoid composition of about 0.80% carbon. The pins 4 - 7 are not made of a relatively hard material.

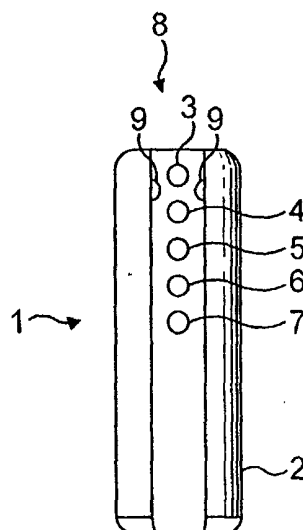


FIG. 2

Description

[0001] The invention relates to locks, particularly to cylinder locks, which include Euro-cylinder locks, which have a specification equivalent to British standard EN 1303.

[0002] Cylinder locks are usually key-operable. There is typically a body which is generally cylindrical which houses a cylinder rotatable on entry of a key from one end. Rotation enables actuation of a catch or similar release mechanism connected to the end of the cylinder opposite the key entry. The cylinder is locked against unwanted rotation by differ pins, which are of different lengths and are each arranged under spring pressure. The differ pins extend transversely to the longitudinal axis of the cylinder, and in line longitudinally of the cylinder, as considered from the key entry end. The differ pins drop into seatings in the cylinder to effect locking against unwanted rotation, and hence unwanted actuation of the lock.

[0003] The key has a surface profile which corresponds to the "profile" determined by the differ pins so that when the correct key is inserted in the entry end of the lock, it is able to be pushed in and in so doing it raises the differ pins in turn from their respective seatings against the spring pressure just to clear the boundary surface of the cylinder, which can then be turned by the key after full insertion thereof. Removal of the key allows the differ pins to drop back into their respective locks, to effect locking.

[0004] It is unfortunate that burglary of premises is on the increase, with the result that unauthorised access to areas protected by locks is increasingly of interest to people such as burglars. A lock is perceived as a weak point of a protected area, and is thus vulnerable to attack.

[0005] It is accordingly an object of the invention to seek to protect a cylinder lock against attack, and hence unauthorised entry.

[0006] According to a first aspect of the invention there is provided a cylinder lock, comprising a cylinder having part of a hardness which is relatively increased as compared with other parts of the lock.

[0007] The part may be a relatively hardened differ pin.

[0008] The pin may comprise a hardened steel.

[0009] The pin may be made solely of hardened steel. Thus the pin may have a jacket or core of hardened steel, or may be formed entirely of hardened steel.

[0010] The steel may comprise an iron-carbon steel having a eutectoid composition of about 0.80% carbon.

[0011] The relatively hardened differ pin may be a pin which is mounted closest to the key entry point of the cylinder.

[0012] The part may also comprise an additional relatively hardened device. Suitably, the device may comprise a plurality of additional fixed relatively hard pins mounted in the cylinder.

[0013] In a preferred embodiment, there may be two such additional pins, preferably mounted adjacent the hardened differ pin.

[0014] The two additional pins may be inclined to the axis of the line of differ pins. Suitably, they may be positioned between the hardened differ pin and an immediately adjacent non-hardened differ pin.

[0015] The lock may be a double cylinder lock, one or both of which may comprise a cylinder as hereinbefore defined.

[0016] According to a further aspect of the invention there is provided a closure mounting a cylinder lock as hereinbefore defined.

[0017] Cylinder locks embodying the invention are hereinafter described, by way of example, with reference to the accompanying drawings.

Fig. 1 is an end elevational view of a cylinder lock according to the invention;

Fig. 2 is a plan view of the lock of Fig. 1, viewed in the direction of arrow II; and

Fig. 3 is a side elevational view of a double cylinder lock according to the invention.

[0018] Referring to the drawings, in which like parts are referred to by like reference numerals, there is shown a cylinder lock 1, comprising a cylinder 2 having part 3 of a hardness which is relatively increased as compared with other parts of the lock 1. Stated in another way, part of the lock 1 is formed of a hardened material, in this case the first (adjacent a key hole end of the cylinder) differ pin 3 of a row of differ pins 3, 4, 5, 6, 7 arranged longitudinally of the lock 1, the differ pins themselves extending transversely of the longitudinal axis of the cylinder 2, and being mounted under pressure of a respective spring (not shown). The pin 3 is in the embodiment made of a hardened steel, such as an iron-carbon steel having a eutectoid composition of about 0.80% carbon, which steel is hardened and tempered in the usual way.

[0019] It is often the case that a burglar seeking unauthorised access to an area protected by the lock 1 will attack it by attempting to drill in from the key-hole end or face 8. In a normal lock, this is easily achieved, as the cylinder and differ pins are usually made of brass, a relatively soft material.

[0020] In the lock 1 embodying the invention, the hardened steel differ pin 3 acts as a barrier which prevents drilling out of the cylinder 2, with the result that the lock 1 is protected from attack, and in turn protects the area it locks against unauthorised access.

[0021] There may be additional security pins 9. These are also hardened steel pins which are fixed in the cylinder 2, being inclined to the length of the row of differ pins 3 - 7 and being positioned laterally, or circumferentially, on either side of the hardened differ pin 3, as

shown in Fig. 2, or between that pin 3 and the immediately adjacent unhardened pin 4, as shown in Fig. 3.

[0022] The pin or pins 3, 9 may be of brass, with either a hardened steel shell or coat, or core, or it or they may be made entirely of hardened steel.

[0023] Also, the face 8 of the cylinder 2 bearing the key-hole 11 may also be of relatively hardened material, such as hardened steel. This hardened face may be a sole part of increased hardness, or it may be used in conjunction with a hardened differ pin 3.

[0024] As shown in Fig. 3, one or both cylinder locks of a double cylinder lock 12 may have a cylinder embodying the invention.

[0025] It will be understood that the hardened pin 3, the additional security pins 9 and/or part of the cylinder such as the face 8 may be hardened using a material other than the hardened carbon steel mentioned. In all embodiments, however, a cylinder lock embodying the invention is protected against attack by a tool such as a drill applied to the face 8, so enhancing security of an area protected by a lock 1, 12 embodying the invention.

[0026] Stated in another way, a lock embodying the invention and as shown in the drawings is protected from attack in a direction in which a key is offered up to the lock for operation.

prising a plurality of additional fixed relatively hard pins mounted in the cylinder.

10. A lock according to Claim 9, comprising two such additional pins.

11. A lock according to Claim 10, the additional pins being mounted adjacent the hardened differ pin.

12. A lock according to Claim 11, the additional pins being inclined to the axis of the line of differ pins.

13. A lock according to Claim 12, the additional pins being positioned between the hardened differ pin and the immediately adjacent non-hardened differ pin.

14. A double cylinder lock, one or both of which cylinders comprising a cylinder according to any preceding claim.

15. A closure, mounting a cylinder lock according to any preceding claim.

Claims

1. A cylinder lock, comprising a cylinder having part of a hardness which is relatively increased as compared with other parts of the lock.
2. A lock according to Claim 1, the part comprising a relatively hardened differ pin.
3. A lock according to Claim 2, the differ pin comprising a hardened steel.
4. A lock according to Claim 3, the pin being made solely of hardened steel.
5. A lock according to Claim 3, the pin comprising a jacket or core of hardened steel.
6. A lock according to any of Claims 3 to 5, the steel comprising an iron-carbon steel having a eutectoid composition of about 0.80% carbon.
7. A lock according to any of Claims 2 to 6, the relatively hardened differ pin being a pin which is mounted closest to the key entry point of the cylinder.
8. A lock according to any preceding claim, comprising an additional relatively hardened device.
9. A lock according to Claim 8, the said device com-

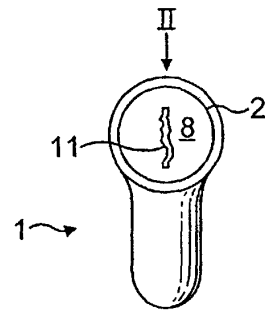


FIG. 1

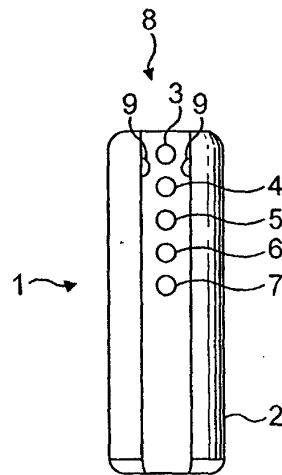


FIG. 2

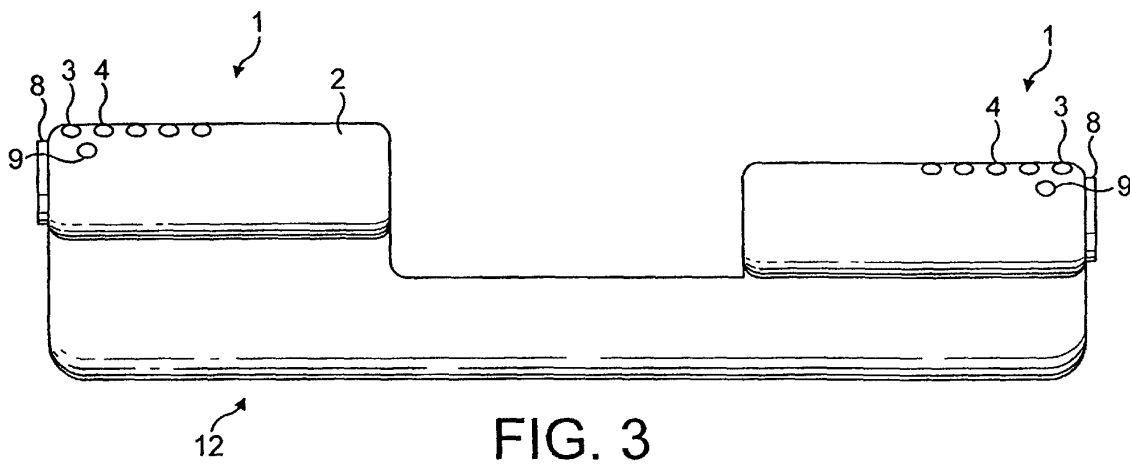


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 04 25 0820

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 298 681 A (DIFFUSION ALLOYS LTD) 11 January 1989 (1989-01-11) * the whole document *	1-8,14, 15	E05B15/16 E05B27/00
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E05B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 9 June 2004	Examiner Vacca, R
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 04 25 0820

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
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