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(54) A COMBINED ANTI-THEFT LOCK-CYLINDER MECHANISM

(57) The present invention relates to a combined anti-theft lock-cylinder mechanism, including a corresponding key and a lock-cylinder module that consists of a lock-cylinder shaft sleeve and a lock-cylinder shaft that is rotatable in the sleeve; a key slot in the lock-cylinder shaft; a groove on the inserting-end face where the key enters the cylinder; a pin hole crossing the key slot at the rear end of the key slot in the lock-cylinder shaft; a dowel pin closely fit in the pin hole. The groove and the dowel pin match each other. The pin hole is formed in a radial and eccentric manner in the lock-cylinder shaft at the rear end of the key slot and the groove is formed in a symmetric manner on the inserting-end face for the key. The present invention has overcome the problems in the existing traditional lock mechanism such as easy duplicating of the key, poor anti-theft performance, and abnormal wear caused by easy wiggle of the key in the lock cylinder. With the above-mentioned design, the present invention increases the difficulty in duplicating the key to the combined anti-theft lock-cylinder mechanism and improved anti-theft performance. Moreover, it possesses such advantages as simple and compact design, high fitting accuracy, smooth key plugging in and connecting with the lock cylinder, convenient operation, and high reliability.

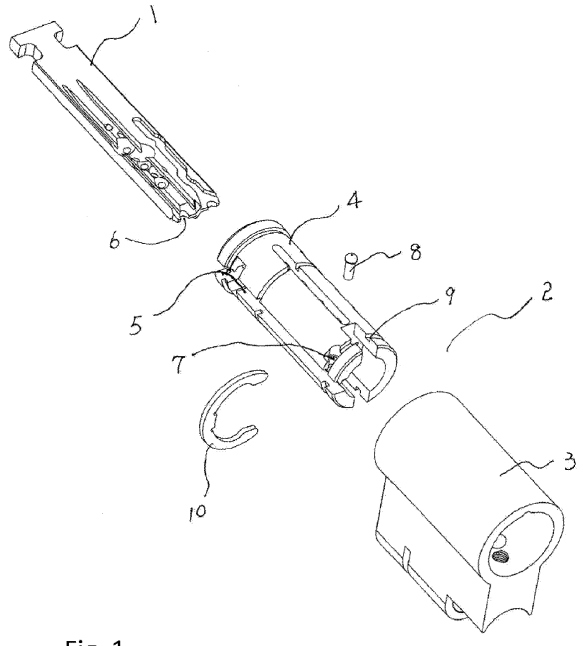

Fig. 1

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Description

Field of the invention

[0001] The present invention relates to a combined anti-theft lock-cylinder mechanism

Background of the invention

[0002] One type of known lock mechanism of a lock cylinder consists of a key and a corresponding lock-cylinder module where the key has specially designed code grooves on both sides. When the key is inserted into the lock cylinder, the uniquely cut code grooves and the balls inside the lock cylinder will match and fit each other. The lock will be opened when the balls' positioning is correct.

[0003] Because it is easy to duplicate the key to the above-mentioned lock cylinder of the lock mechanism, the lock has a poor anti-theft performance. Furthermore, the key in the lock cylinder is easy to wiggle, which will not only cause abnormal wear of the lock cylinder and the key, but also reduce reliability.

Detailed summary of the invention

[0004] In order to overcome the problems in the existing traditional lock mechanism of the prior art such as easy duplication of the key, poor anti-theft performance, and abnormal wear caused by easy wiggle of the key in the lock cylinder, the present invention provides a solution-a combined anti-theft lock-cylinder mechanism. The combined mechanism is in simple and compact design, and it is relatively difficult to duplicate the key. In addition, the solution is characterized by high fitting accuracy and high reliability.

[0005] The technologies adopted by the present invention to solve the technical problems include a corresponding key and a lock-cylinder module, which consists of a lock-cylinder shaft sleeve and a lock-cylinder shaft that is rotable in the sleeve; a key slot in the lock-cylinder shaft; a groove on the inserting-end face where the key enters the cylinder; a pin hole crossing the key slot at the rear end of the key slot in the key cylinder shaft; a dowel pin closely fit in the pin hole, and the matching of the groove and the dowel pin.

[0006] The lock-cylinder shaft is inserted in the lock-cylinder shaft sleeve, and the shaft has a snap spring groove on the outside of the shell. The snap spring to be stuck in the snap spring groove is for positioning and connecting the lock-cylinder shaft and the lock-cylinder shaft sleeve. The open end of the pin hole is intersected and connected with the snap spring groove.

[0007] The pin hole is formed in a radial and eccentric manner in the lock-cylinder shaft at the rear end of the key slot.

[0008] The groove is formed in a symmetric manner on the inserting-end face for the key.

[0009] With the above-mentioned specific design, the present invention is more difficult to duplicate the key to the combined anti-theft lock-cylinder mechanism, and has improved anti-theft performance. Moreover, it possesses such advantages as simple and compact design, high fitting accuracy, smooth key entering and connecting, convenient operation and high reliability.

Descriptions of the drawings

[0010] The invention will now be described with reference reference to the attached figures and embodiment.

Figure 1 is an exploded view an embodiment of the lock and key of the present invention.

Figure 2 is a sectional view of the assembly structure diagram an embodiment of the lock and key present invention.

Figure 3 is the A-A sectional view of the lock and key of Figure 1.

Figure 4 is the B-B sectional view of the lock and key of Figure 1.

Detailed description of the embodiment

[0011] As shown in the figures, the present invention consists of a key 1 and a corresponding key cylinder module 2, which includes a key cylinder shaft sleeve 3 and a key cylinder shaft 4 that is rotatable in the sleeve 3 which has a key slot 5. The inserting-end face of the key 1 has a groove 6. There is a pin hole 7 crossing the key slot 5 at the rear end of the key slot 5 in the key cylinder shaft 4. A dowel pin 8 closely fits in the pin hole 7, and the groove 6 co-operates with the dowel pin 8.

[0012] The lock-cylinder shaft 4 is inserted in the lock-cylinder shaft sleeve 3. The lock-cylinder shaft 4 has a snap spring groove 9 on the outside of the lock shell. When the snap spring 10 is inserted into the snap spring groove 9, the positioning and connecting of the lock-cylinder shaft 4 and the lock-cylinder shaft sleeve 3 is complete. The open end of the pin hole 7 is intersected by and connected with the snap spring groove 9.

[0013] The pin hole 7 is formed in a radial and eccentric manner in the lock-cylinder shaft 4 at the rear end of the key slot 5. The groove 6 is formed in a symmetric manner on the inserting-end face for the key 1.

[0014] In use, when the key 1 is inserted into the key slot 5, if the key 1 is the correct key, it can reach into the right place, such that the groove 6 and the dowel pin 8 are constrained in their position, and then the key 1 and the balls provided in the lock-cylinder module 2 will be in the correct position too, thus the lock cylinder can be normally opened.

[0015] If an inserted key has no groove 6, or the pattern is different in specification or location from the groove 6, the key cannot reach the right place and the lock cylinder will not be opened.

[0016] When inserting the key 1, there is no need to orient the side one way or the other due to the symmet-

rically designed groove 6, which can co-operate with the dowel pin 8. The key can unlock the lock with either side up, making it convenient to use.

[0017] The design of the groove 6 increases the difficulty in duplicating the key. This design has enhanced the anti-theft performance of the lock cylinder against a burglar.

[0018] The above is only a description of the preferred embodiment of the present invention of the combined anti-theft lock-cylinder mechanism, but by no means the limitation to the conception and scope of the invention. Without departing from the spirit of the present invention proposal, all the changes and modifications of the technical proposal of the invention by those skilled in the art shall fall into the protection scope of this combined anti-theft lock-cylinder mechanism in the invention.

Claims

1. A combined anti-theft lock-cylinder mechanism comprising:

a key and a corresponding lock-cylinder module;
the module including a lock-cylinder sleeve and a lock-cylinder shaft;
a lock-cylinder shaft rotatable in the sleeve;
a lock-cylinder shaft with a key slot;
a key slot featuring a groove (6) on the inserting-end face where the key (1) enters the cylinder;
a pin hole (7) crossing the key slot (5) at the rear end face of the key slot (5) in the key cylinder shaft; and
a dowel pin (8) which fits in the pin hole (7) where the groove (6) co-operates with the dowel pin (8).

2. The combined anti-theft lock-cylinder mechanism of Claim 1 wherein there is provided:

a lock-cylinder shaft (4) inserted in the lock-cylinder shaft sleeve (3);
the lock-cylinder shaft (4) having a snap spring groove (9) in the outside shell;
a snap spring (10) clipped in the snap spring groove (9) for positioning of the lock-cylinder shaft (4) and the lock-cylinder shaft sleeve (3); and
an open end of the pin hole connected with the snap spring groove (9).

3. The combined anti-theft lock-cylinder mechanism of Claim 1 or Claim 2 wherein:

a pin hole (7) is formed in a radial and eccentric manner in the lock-cylinder shaft (4) at the rear end face of the key slot (5).

4. The combined anti-theft lock-cylinder mechanism of Claim 3 wherein:

a groove (6) is formed in a symmetric manner on the inserting-end face for the key (1).

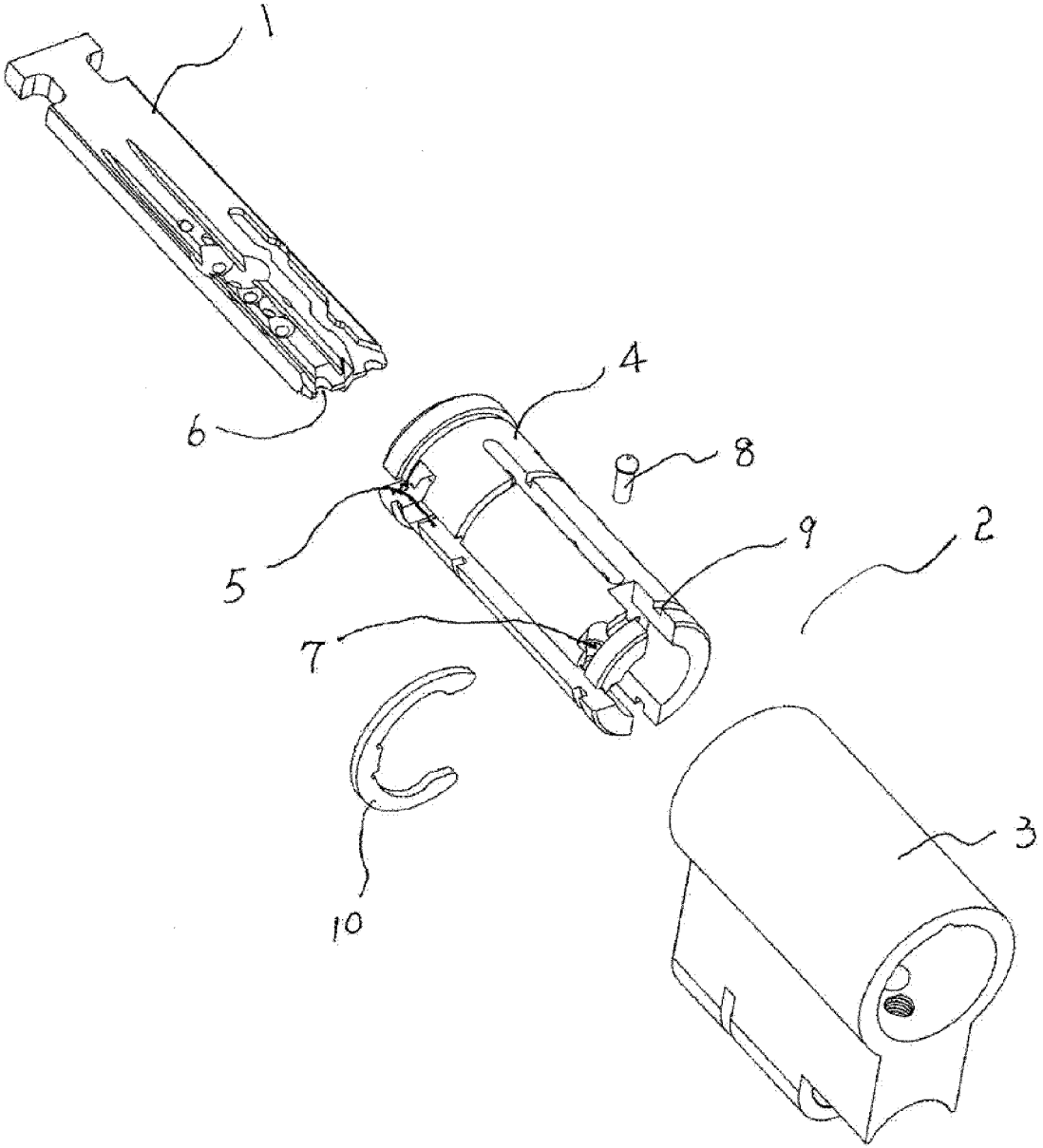
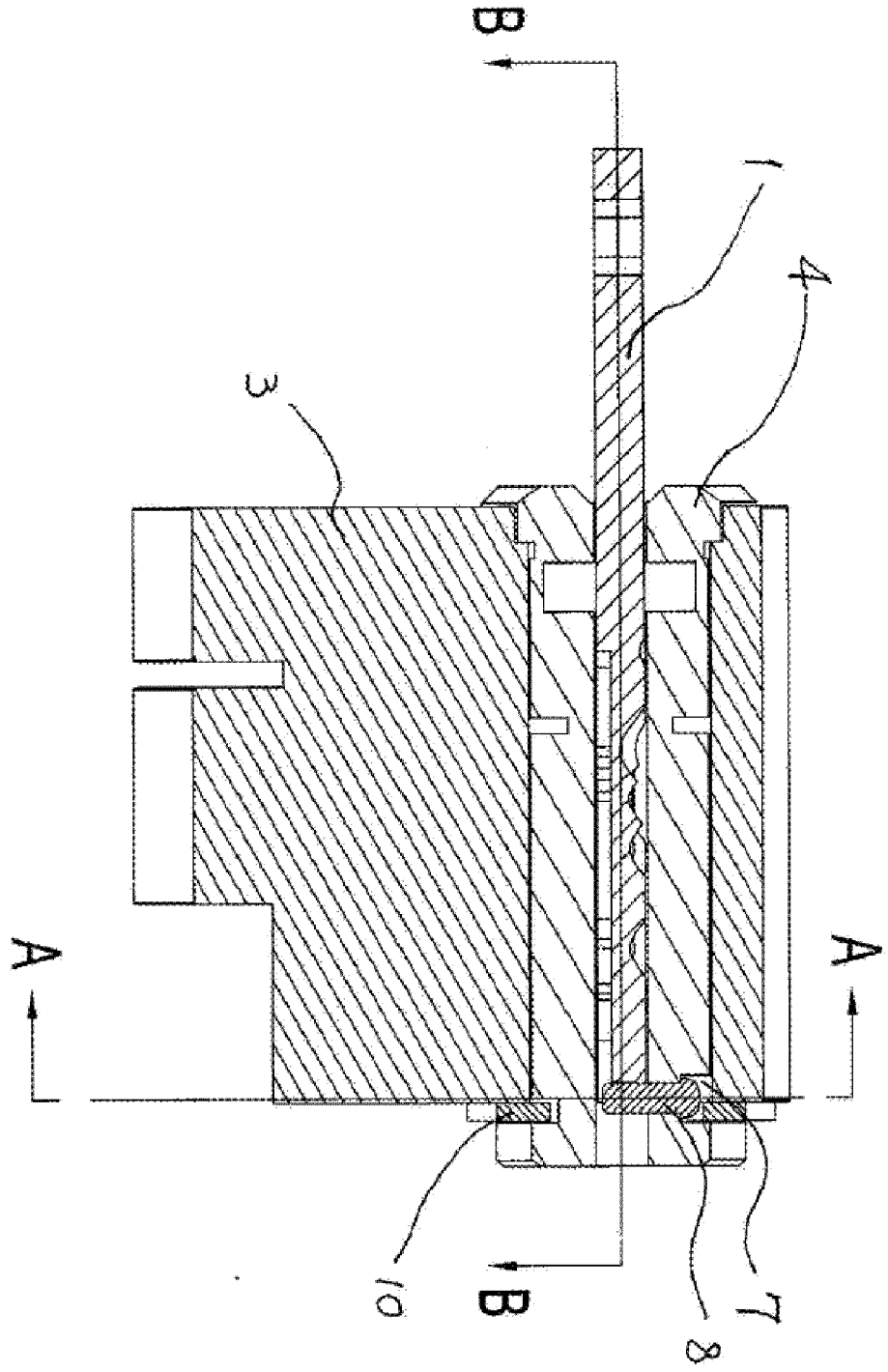


Fig. 1

Fig. 2



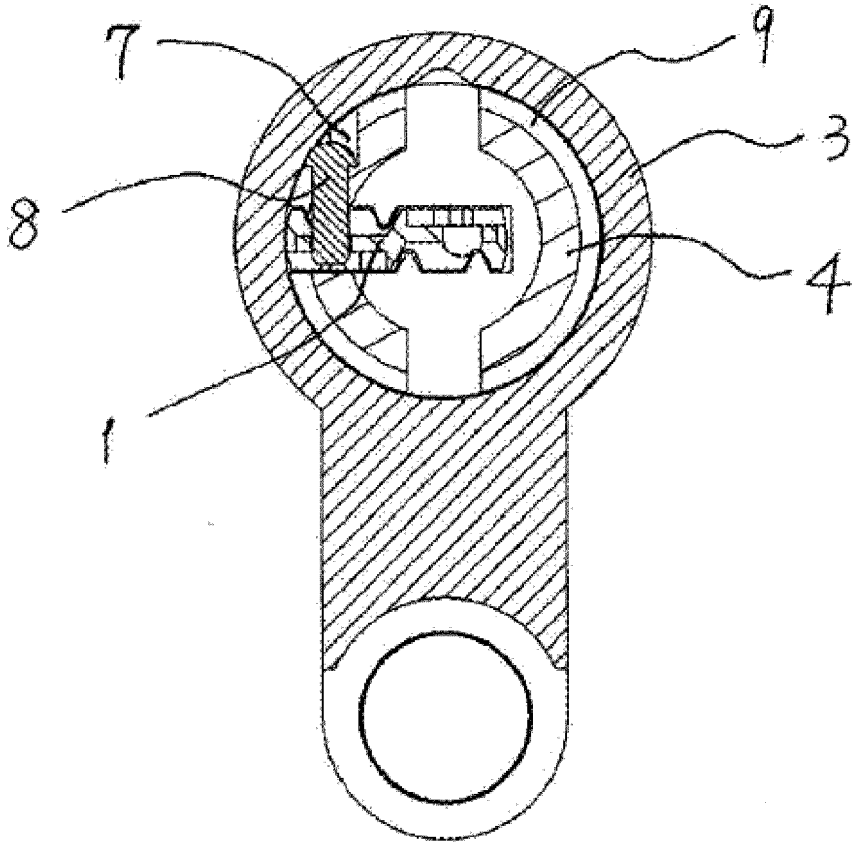


Fig. 3

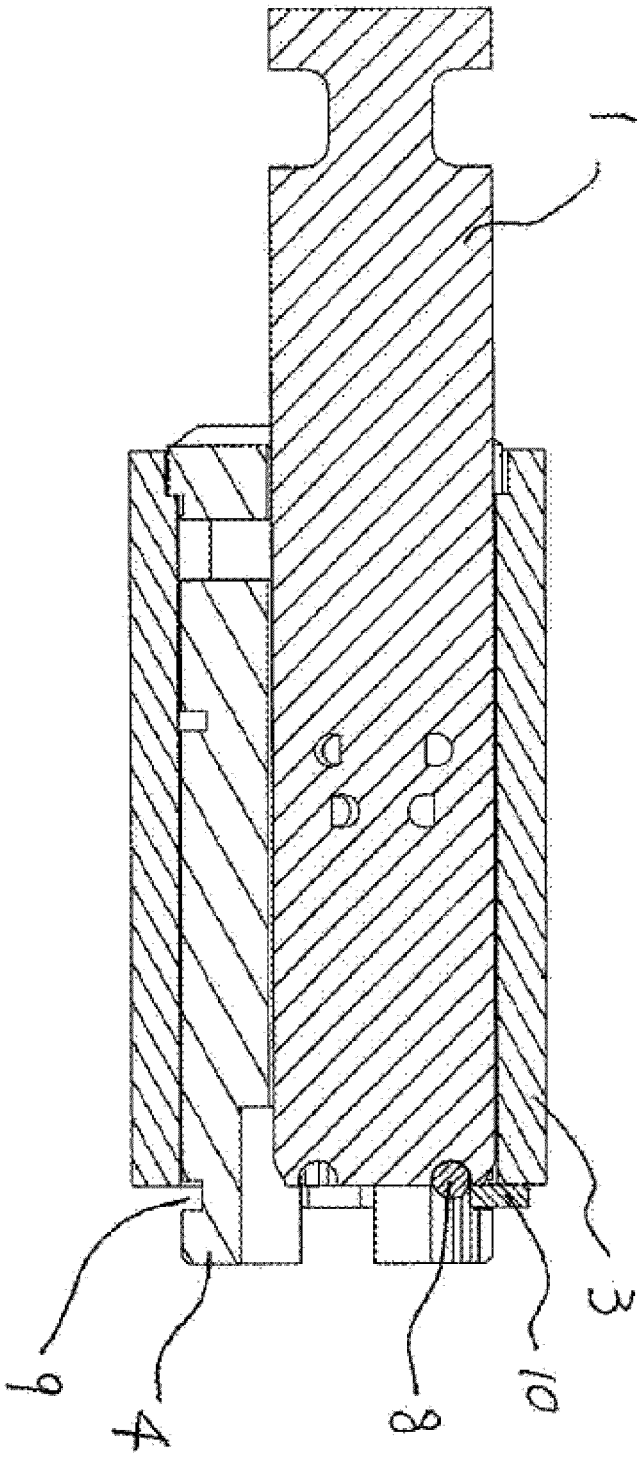


Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 17 17 5581

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	DE 100 31 972 A1 (WINKHAUS FA AUGUST [DE]) 10 January 2002 (2002-01-10)	1	INV. E05B27/00 E05B27/02 E05B9/08
A	* the whole document *	2-4	
X	CZ 20 140 214 A3 (ASSA ABLOY CZECH & SLOVAKIA S R O [CZ]) 17 June 2015 (2015-06-17)	1	
A	* figures 1, 8, 9, 11, 14 *	2-4	
A	US 913 942 A (BODGE JOHN W [US]) 2 March 1909 (1909-03-02) * figures 1,2,5 *	1-4	

TECHNICAL FIELDS SEARCHED (IPC)

E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 November 2017	Cruyplant, Lieve

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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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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28-11-2017

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