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

KOMBINIERTER DIEBSTAHLSICHERER SCHLIESSZYLINDERMECHANISMUS

MÉCANISME DE BARILLET DE SERRURE ANTIVOL COMBINÉ

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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.

**[0004]** DE10031972 (Winkhaus) shows a lock including a supplementary tumbler 8, which falls in a corresponding cut-out portion of the key to allow operation of the lock. The supplementary tumbler and the key are machined to have the same profile.

### Detailed summary of the invention

**[0005]** 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.

**[0006]** 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 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 key cylinder shaft; a dowel pin closely fit in the pin hole, and the matching of the groove and the dowel pin.

**[0007]** 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.

**[0008]** The pin hole is formed in a radial and eccentric

manner in the lock-cylinder shaft at the rear end of the key slot.

**[0009]** The groove is formed in a symmetric manner on the inserting-end face for the key.

5 **[0010]** 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

15 **[0011]** The invention will now be described with reference reference to the attached figures and embodiment.

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

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

Figure 3 is the A-A sectional view of the lock and key of Figure 2.

25 Figure 4 is the B-B sectional view of the lock and key of Figure 2.

### Detailed description of the embodiment

30 **[0012]** 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.

35 **[0013]** 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.

40 **[0014]** 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.

45 **[0015]** 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.

50 **[0016]** 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.

**[0017]** When inserting the key 1, there is no need to orient the side one way or the other due to the symmetrically 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.

**[0018]** 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.

**[0019]** 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 scope of the present invention as defined by the appended claims, 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, as defined by the appended claims.

## Claims

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

a key (1) and a corresponding lock-cylinder module (2);  
 the module including a lock-cylinder sleeve (3) and a lock-cylinder shaft (4);  
 the lock-cylinder shaft rotatable in the sleeve;  
 the lock-cylinder shaft with a key slot (5);  
 the key 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) wherein the lock-cylinder shaft (4) is inserted in the lock-cylinder shaft sleeve (3);

**characterized in that** the lock-cylinder shaft (4) is provided with a snap spring groove (9) in the outside shell;

with a snap spring (10) which is clipped in the snap spring groove (9) for positioning of the lock-cylinder shaft (4) and the lock-cylinder shaft sleeve (3); and

with an open end of the pin hole (7) connected with the snap spring groove (9).

2. The combined anti-theft lock-cylinder mechanism of Claim 1 wherein: the 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).

3. The combined anti-theft lock-cylinder mechanism of Claim 2 wherein: the groove (6) is formed in a symmetric manner on the inserting-end face for the key (1).

## Patentansprüche

1. Ein kombinierter Diebstahlschutz-Zylindermechanismus umfassend:

einen Schlüssel (1) und ein entsprechendes Schließzylindermodul (2);  
 das Modul enthält eine Schließzylinderhülse (3) und einen Schließzylinderschaft (4);  
 der Schließzylinderschaft ist in der Hülse drehbar;  
 der Schließzylinderschaft verfügt über eine Schlüsselnut (5);

der Schlüssel mit einer Rille (6) am Einschiebende, an dem der Schlüssel (1) in den Zylinder gesteckt wird;

ein Stiftloch (7), das durch die Schlüsselnut (5) am hinteren Ende der Schlüsselnut (5) in dem Schlüsselzylinderschaft verläuft; und

einen Passstift (8), der in das Stiftloch (7) passt, in dem die Rille (6) mit dem Passstift (8) zusammenwirkt, wobei der Schließzylinderschaft (4) in die Schließzylinderschaft-Hülse (3) eingeführt wird;

**gekennzeichnet dadurch, dass** der Schließzylinderschaft (4) mit einer Federringnut (9) an der Außenhülle versehen ist;  
 mit einem Federring (10), der in die Federringnut (9) eingesetzt wird, um den Schließzylinderschaft (4) und die Schließzylinderschaft-Hülse (3) zu positionieren; und  
 mit einem offenen Ende des Stiftlochs (7), das mit der Federringnut (9) verbunden ist.

2. Der kombinierte Diebstahlschutz-Zylindermechanismus nach Anspruch 1, wobei:

Das Stiftloch (7) in radialer und exzentrischer Weise in dem Schließzylinderschaft (4) am hinteren Ende der Schlüsselnut (5) geformt ist.

3. Der kombinierte Diebstahlschutz-Zylindermechanismus nach Anspruch 2, wobei:

Die Rille (6) in symmetrischer Weise am Einfügenden für den Schlüssel geformt ist (1).

## Revendications

1. Mécanisme de barillet de serrure antivol combiné comprenant :

une clé (1) et un module de barillet de serrure

correspondant (2) ;  
 le module comportant une chemise de barillet de serrure (3) et un axe de barillet de serrure (4) ;  
 l'axe de barillet de serrure pouvant tourner dans la chemise ; 5  
 l'axe de barillet de serrure comportant une fente de clé (5) ;  
 doté d'une rainure (6) sur la face d'extrémité d'insertion où la clé (1) pénètre dans le barillet ; 10  
 un trou de cheville (7) traversant la fente de clé (5) au niveau de la face d'extrémité arrière de la fente de clé (5) dans l'axe de barillet de clé ; et 15  
 une cheville (8) qui s'insère dans le trou de cheville (7) où la rainure (6) coopère avec la cheville (8) dans lequel l'axe de barillet de serrure (4) est inséré dans la chemise de l'axe de barillet de serrure (3) ;  
**caractérisé en ce que** l'axe de barillet de serrure (4) est muni d'une rainure de ressort à encliquetage (9) dans la coque extérieure ; 20  
 comportant un ressort à encliquetage (10) qui est encliqueté dans la rainure du ressort à encliquetage (9) destinée au positionnement de l'axe de barillet de serrure (4) et de la chemise de l'axe de barillet de serrure (3) ; et 25  
 comportant une extrémité ouverte du trou de cheville (7) raccordé avec la rainure du ressort à encliquetage (9).

2. Mécanisme de barillet de serrure antivol combiné selon la revendication 1, dans lequel : 30  
 le trou de cheville (7) est formé d'une manière excentrique et radiale dans l'axe de barillet de serrure (4) au niveau de la face d'extrémité arrière de la fente de clé (5). 35
3. Mécanisme de barillet de serrure antivol combiné selon la revendication 2, dans lequel :  
 la rainure (6) est formée d'une manière symétrique sur la face d'extrémité d'insertion pour la clé (1). 40

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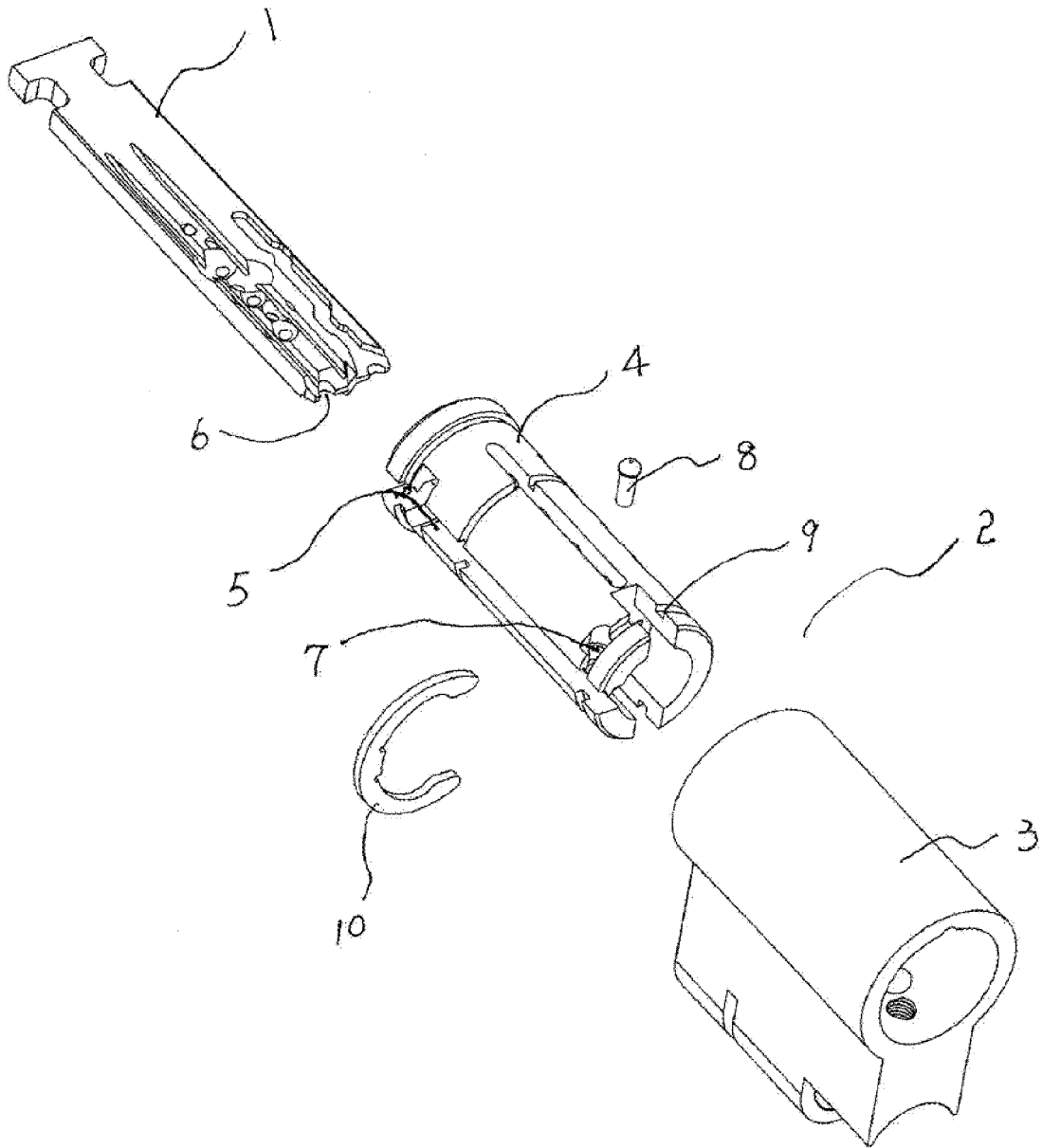


Fig. 1

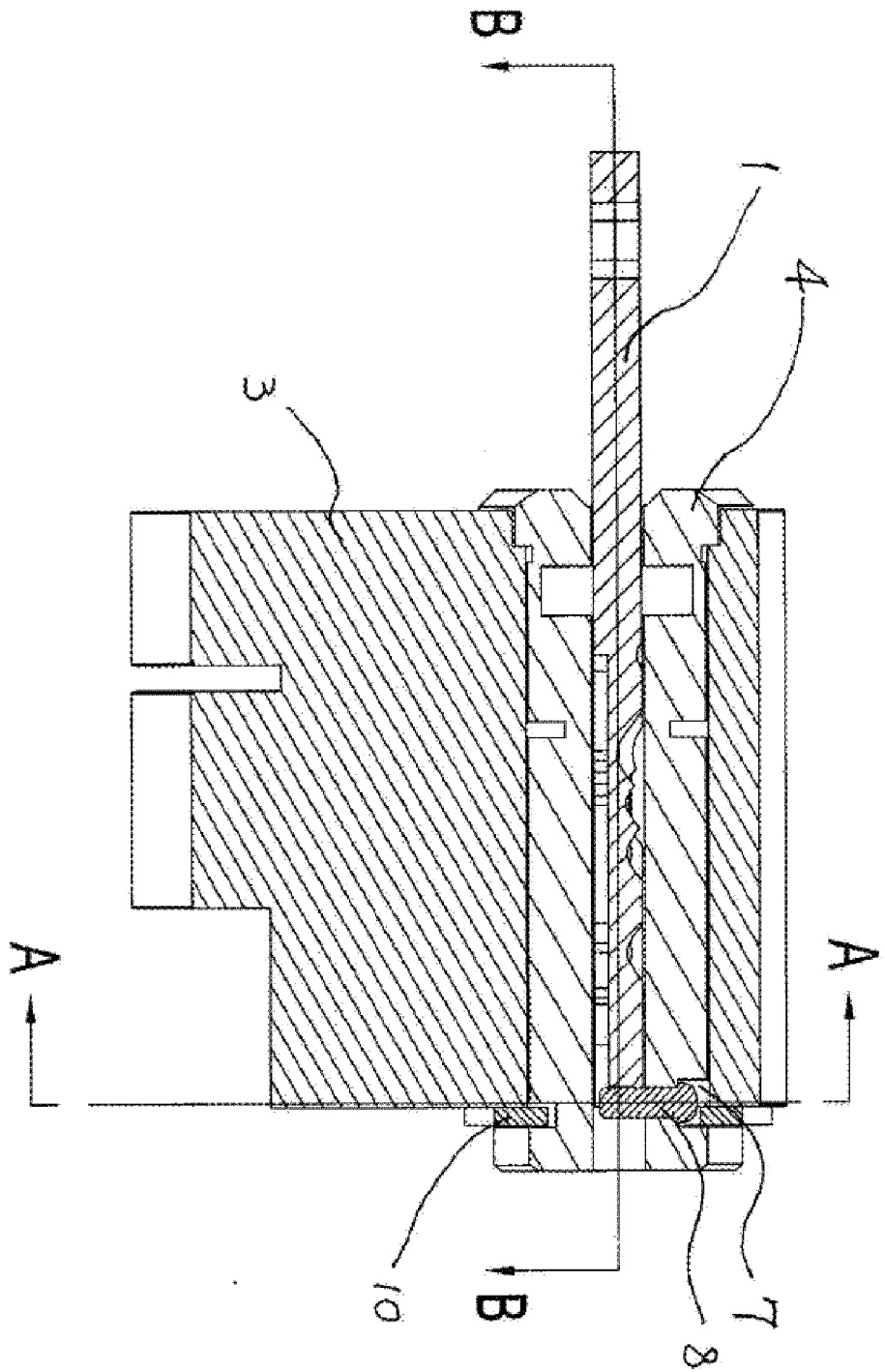


Fig. 2

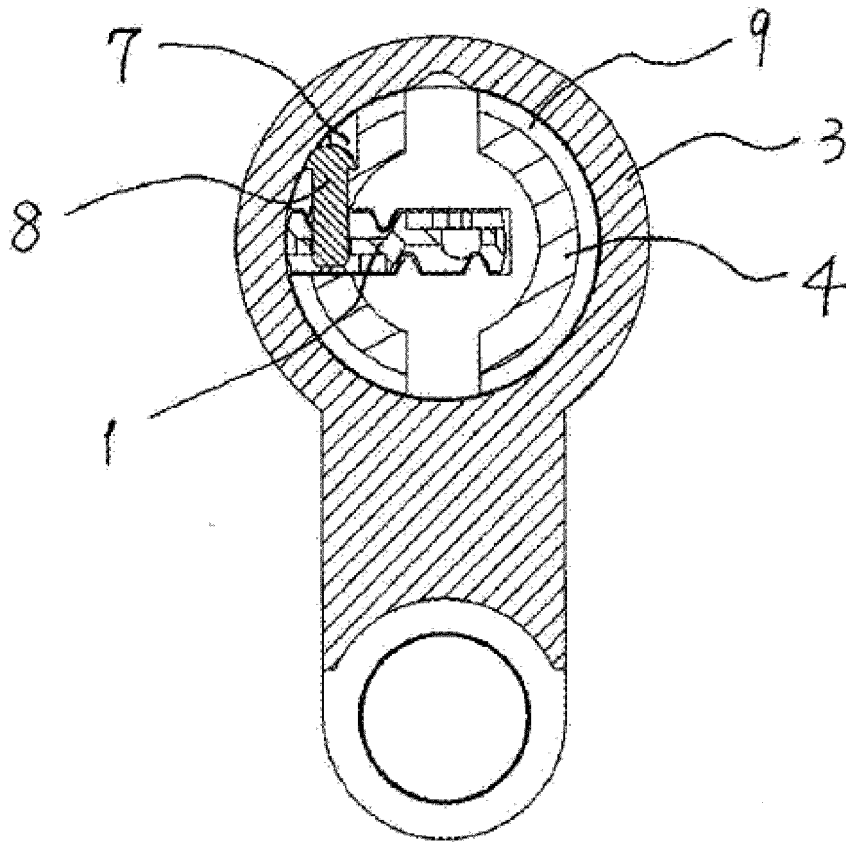


Fig. 3

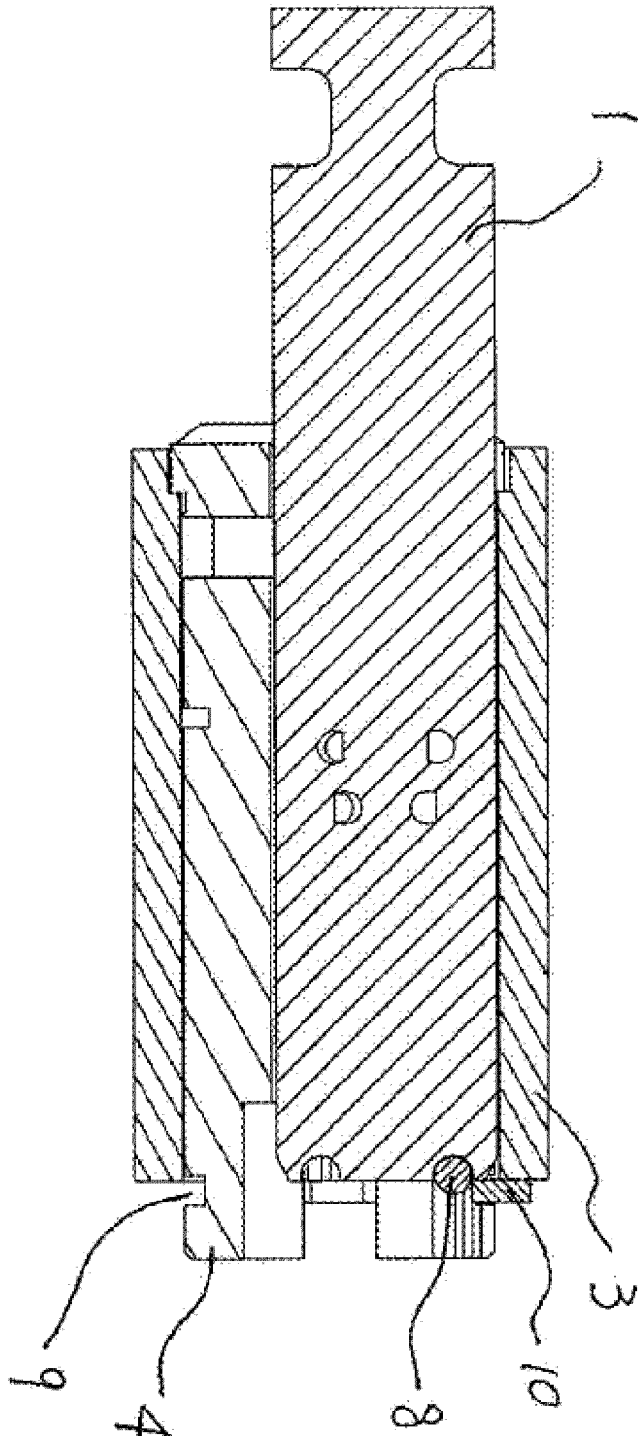


Fig. 4

**REFERENCES CITED IN THE DESCRIPTION**

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