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(54) LOCK CORE

(57) A lock core (10) could provided in a lock comprises a hollow column body (12) accommodating therein a columned upper shaft rotating body (14) and a columned lower shaft rotating body (16) separated from each other. A nonrotatable stop body (18) fixed in the column body (12) is provided between the upper and lower shaft rotating bodies.

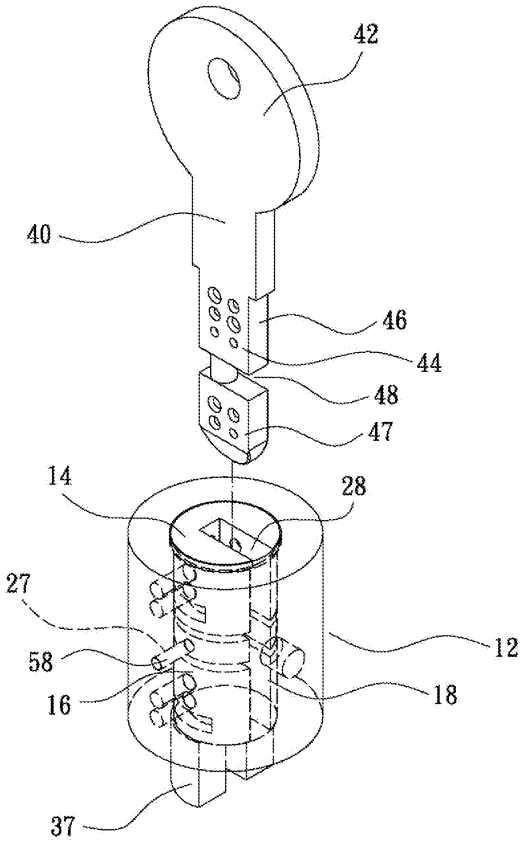

Fig. 8

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Description

Technical Field

[0001] The present invention relates to a lock core configuration of a lockset, especially to a lock core structure with an anti-theft function.

Background Art

[0002] The existing conventional anti-theft lock basically comprises a lock seat provided on a lockset, and a single lock core is then provided within the lock seat. The purpose of unlocking is achieved by inserting a corresponding key into a key hole of the lock core and rotating the same to release a lockout function between a lock pin and the lock seat within the lock core structure. However, no matter how complicated the structure of the lock core is, the lock core is of a simplified design which can enable thieves to easily unlock with picking tools, such as inserting a probe into the key hole of the lock core by means of exploration and gradually unlocking the lock in an exploring manner, and finally, the thieves can successfully unlock in an extremely short time to achieve the purpose of stealing.

[0003] For that reason, the inventor is engaged in designing an anti-theft lock core that cannot be unlocked by thieves with any kind of picking tools to achieve the purpose of stealing. Finally, the present invention is brought forth after numerous researches and experiments.

Summary of the Invention

[0004] The main purpose of the present invention is to provide a lock core structure of a lockset, which makes thieves unable to unlock with picking tools, so as to realize an anti-theft function.

[0005] For the accomplishment of the aforementioned purpose, the present invention provides thefollowing solution:

A lock core configuration of a lockset, comprising:

a hollow cylinder providedon the entity of the lockset and having an inner chamber with a circular cross section;
a cylindrical upper axially rotating body and a cylindrical lower axially rotating body which are separated from each other, can be provided in said inner chamber, and are capable of rotating; and
a blocking body provided between the upper and lower axially rotating bodies and firmly fixed within the inner chamber of an outer cylinder, without rotating.

[0006] If said structure is adopted, when an unlocking attempt is made by a thief with picking tools, the thief can at most effect a decoding unlocking procedure on the upper axially rotating body. Due to a non-rotatable situation of the blocking body, it is impossible to carry out a rotating unlocking procedure on the lower axially rotating body with the picking tools, which finally would stop the theft.

Brief Description of the Drawings

[0007]

Fig. 1 is a schematic perspective view of an interaction between the lock core and a key of the present invention;
Fig. 2 is an exploded perspective view of the integral lock core and the key of the present invention;
Fig. 3 is an exploded perspective view of internal members of the integral lock core and the key of the present invention;
Fig. 4 is a sectional view of Fig. 2 of the present invention;
Fig. 5 is another sectional view of Fig. 2 of the present invention;
Fig. 6 is a topview of the upper axially rotating body of the lock core of the present invention rotating in the inner chamber of the outer cylinder;
Fig. 7 is a schematic perspective view of another key embodiment applied to the lock core configuration of the present invention;
Fig.8 is an exploded perspective view of the key and the integral lock core of the embodiment of Fig.7;
Fig.9 is an exploded perspective view of the key and the inner members of the integral lock core of the embodiment of Fig.7;
Fig.10 is a schematic cross-sectional view of Fig.8; and
Fig.11 is another schematic cross-sectional view of Fig.7.

PARTS LIST

[0008]

10 lock core 12 cylinder 14 upper axially rotating body 16 lower axially rotating body
18 blocking body 20 front end portion 21 rear end portion 22 inner chamber
24 aperture 26 outer peripheral surface 27 positioning hole 28 key inserting port
30 first passage 31 reference point 32 upper end surface 34 inserting port
36 second passage 37 actuating portion 38 reference point 40 key
42 handle portion 44 long sheet body 46 first section of tooth row
48 neck section 50 through hole 52 third passage
54 positioning hole 56 outer peripheral surface 58

pin body

Detailed Description of the Invention

[0009] In order to further explain the technical solutions of the present invention, the present invention will be described in details below by specific embodiments.

[0010] The lock core configuration of the present invention can be mounted on entities of any locks, for example, it can be applied to an automotive lock, a locomotive lock, a bicycle lock, a safe case lock and so on. Therefore, the description only describes the structure composition of the lock core. Please with reference to Figs. 1 to 6 simultaneously, the lock core 10 comprises a hollow cylinder 12 having an inner chamber 22; two independent and separated axially rotating bodies, i.e. an upper axially rotating body 14 and a lower axially rotating body 16; and a blocking body 18. The above-described upper axially rotating body 14, the lower axially rotating body 16 and the blocking body 18 have the same circular-shaped cross section, the above-described cylinder 12 has a first end 20 and a second end 21 with an inner chamber 22 formed there between, and the cylinder 12 is provided with a plurality of apertures 24 extending from the outer peripheral surface 26 to the inner chamber 22.

[0011] The upper axially rotating body 14 is accommodated in the inner chamber 22 of the cylinder 12 and can be rotated. The upper axially rotating body 14 is provided with a key inserting port 28 and a first passage 30 having a cross-shaped cross section formed by the extension of the key inserting port 28, and is further provided with a reference point 31 on the outer surface of the inserting port 28 such that the key 40 canalign the orientation to be easily inserted into the first passage 30.

[0012] The lower axially rotating body 16 is also provided in the inner chamber 22 and can be rotated. The lower axially rotating body 16 is also provided with an inserting port 34 and a second passage 36. The second passage 36 is in an vertically aligned design state with the first passage 30, more specifically, the cross-shaped cross sections of the second passage 36 and the first passage 30 are consistent.

[0013] A blocking body 18, which is fixed in the inner chamber 22 of the cylinder, cannot be rotated, and the most important feature is that the blocking body 18 is fixed between the upper axially rotating body 14 and the lower axially rotating body 16.The blocking body 18 is provided with a through hole 50 which is formed with a third passage 52 having a cross-shaped cross section. The third passage 52, the second passage 36 and the first passage 30 all form the same cross-shaped cross section along a central longitudinal axis, allowing a legal key 40 to be inserted therein.

[0014] The main design feature of the present invention is that one blocking body 18 can be accommodated in the above-described inner chamber 22 and is between the upper axially rotating body 14 and the lower axially rotating body 16; the blocking body 18 are firmly fixed in the inner chamber 22, without rotating; and both the upper axially rotating body 14 and lower axially rotating body 16 can be rotated. Apart from being provided with one through hole 50 and one penetrable third passage 52, the blocking body 18 is further provided with a positioning hole 54; and a pin body 58 passes through the positioning hole 27 of the cylinder 12 and the positioning hole 54 of the blocking body 18 to enable the blocking body 18 to be fixed in the cylinder 12. The second section of tooth row 47 of the key passes through the through hole 50 of the blocking body18 and enters the second passage 36 of the lower axially rotating body 16; the neck section 48 of the key 40 is just located in the through hole 50 of the blocking body 18, thus the first section of tooth row 46 of the key 40 is located in the first passage 30 of the upper axially rotating body 14, and the second section of tooth row 47 of the key 40 is located in the second passage 36 of the lower axially rotating body 16; at this time,the key 40 can be rotated to drive the upper axially rotating body 14 and the lower axially rotating body 16 to rotate synchronously. For the action of the configuration of the integrated lock core, when the key 40 is inserted into the first passage 30 and the second passage 36, the neck section 48 of the key 40 is just located in the through hole 50 of the blocking body 18, thus a user can holdthe handle portion 42 of key 40 to enable the key 40 to smoothly rotate in the inner chamber 22 of the cylinder 12, to achieve the normal operation method of unlocking.

[0015] The main feature of the present invention is that one firmly fixed blocking body 18 is provided between the upper axially rotating body 14 and the lower axially rotating body 16. When unlocking is performed by illegally using picking tools, the picking tools must be rotated at a small angle to unlock, which makes the first cross-shaped passage 30 of the upper axially rotating body 14 and the third cross-shaped passage 52 of the blocking body 18 staggered at an opposing angle. Therefore, the leading end of the picking tools would fail to go through the third passage 52 of the blocking body 18 even though the picking tools have passed through the first passage 30. It is well evident that the blocking body 18 can cause disorders to the picking tools. Then the leading end of the picking tools cannot enter the second passage 36 of the lower axially rotating body 16. Therefore, the purpose of illegal unlocking cannot be achieved, which also represents that the present invention can provide a fairly excellent anti-theft effect.

[0016] Please with reference to Figs.7-11, which is the second embodiment of the present invention, the main members still include a cylinder 12, an upper axially rotating body 14, a lower axially rotating body 16 and a locking body 18, and the only change in configuration lies in that the long sheet body 44 of the key 40 is line-shaped, and the first passage 30 of the upper axially rotating body 14 and the second passage of the lower axially rotating body 16 also have a line-shaped cross section corresponding to the shape of the line-shaped long

sheet body 44. The cross sections of the first passage 30 of the upper axially rotating body14, the second passage 36 of the lower axially rotating body 16, the second section of tooth row 47 of the key 40, the first section of tooth row 46 of the key 40 and the like of the present invention can be in different shapes, as long as the first section of tooth row 46 can drive the upper axially rotating body 14 to rotate and the second section of tooth row 47 can drive the lower axially rotating body 16 to rotate.

[0017] In view of the above, the lock core structure of the present invention fixes a blocking body 18, which is non-rotatable but can allow the key 40 to pass there through, in the inner chamber 22 of a cylinder 12; an upper axially rotating body 14 and a lower axially rotating body 16, which are separated from each other and can be rotated, are accommodated in the inner chamber 22 on either side of the blocking body 18; a legal key can smoothly pass through the upper axially rotating body 14, the blocking body 18 and the lower axially rotating body 16 and is rotated to unlock; however, the illegal picking tools are restricted by the blocking body 18 and thus they cannot enter the lower axially rotating body 16. Essentially, the illegal unlocking cannot be performed at all. The utility model is apparently excellent in the anti-theft function and thus has progressiveness. The structure of the present invention is not disclosed ever before and thus has novelty, and therefore, a patent application is filed.

Claims

1. A lock core configuration of a lockset, **characterized in** comprising:

   a cylinder which is hollow, has an inner chamber and can be mounted on an entity of the lockset;
   a blocking body which is provided with a third passage, can be accommodated at the inner chamber of the cylinder, and is firmly fixed to the cylinder without rotating;
   an upper axially rotating body which is accommodated in the inner chamber of the cylinder, can be rotated and is positioned at one side of the blocking body, and which is provided with a first passage to enable a key to pass there through; and
   a lower axially rotating body which is accommodated in the inner chamber of the cylinder, can be rotated and is positioned at the other side of the blocking body, and which is provided with a second passage to enable the key to pass there through.

2. The lock core configuration of the lockset according to claim 1, **characterized in that** a long sheet body of the key is provided with a first section of tooth row and a second section of tooth row which are separated from each other with a neck section provided there between, when the long sheet body is inserted into the lock core, the second section of tooth row of the key is positioned in the second passage of the lower axially rotating body, the first section of tooth row of the key is positioned in the first passage of the upper axially rotating body, while the neck section of the key is just positioned in a through hole of the blocking body.

3. The lock core configuration of the lockset according to claim 2, **characterized in that** the cross sections of the first passage of the upper axially rotating body, the second passage of the lower axially rotating body, the second section of tooth row of the key, the first section of tooth row 46 of the key and the like can be in different shapes, as long as the lower axially rotating body can be driven by the second section of tooth row to rotate, and the upper axially rotating body can be driven by the first section of tooth row to rotate.

4. The lock core configuration of the lockset according to claim 3, **characterized in that** the cross sections of the first passage of the upper axially rotating body, the second passage of the lower axially rotating body, the second section of tooth row of the key, the first section of tooth row of the key and the like are cross-shaped.

5. The lock core configuration of the lockset according to claim 3, **characterized in that** the cross sections of the first passage of the upper axially rotating body, the second passage of the lower axially rotating body, the second section of tooth row of the key, the first section of tooth row of the key and the like are line-shaped.

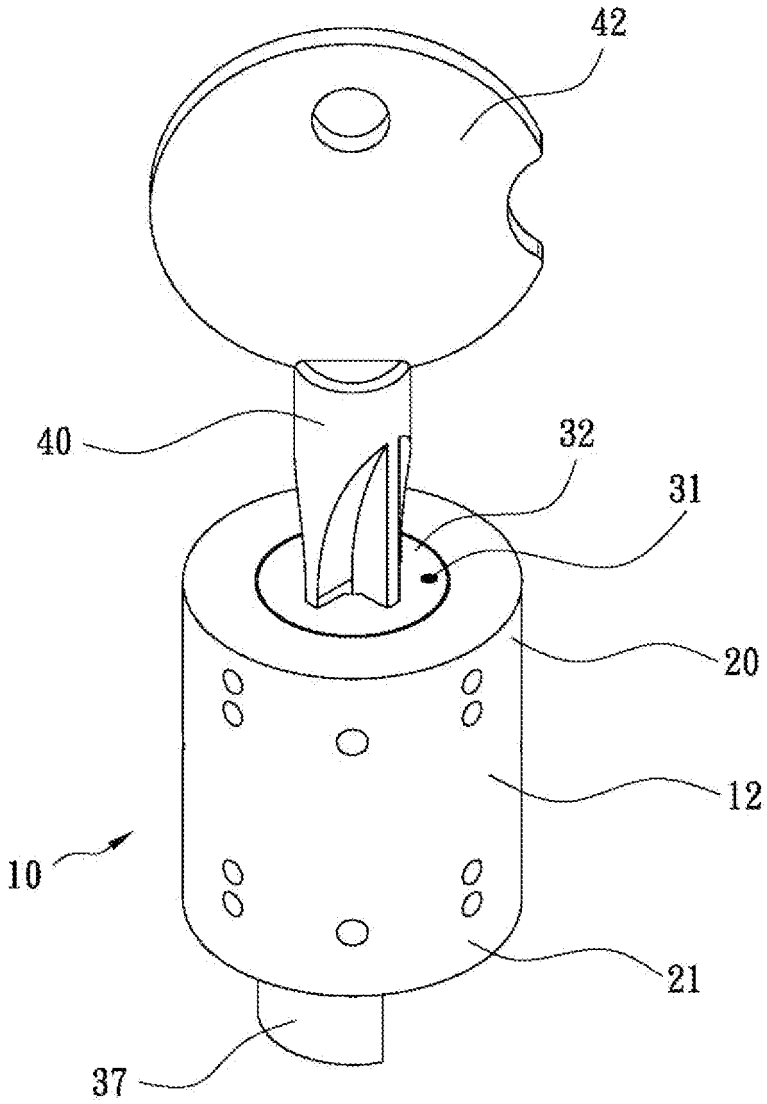

Fig. 1

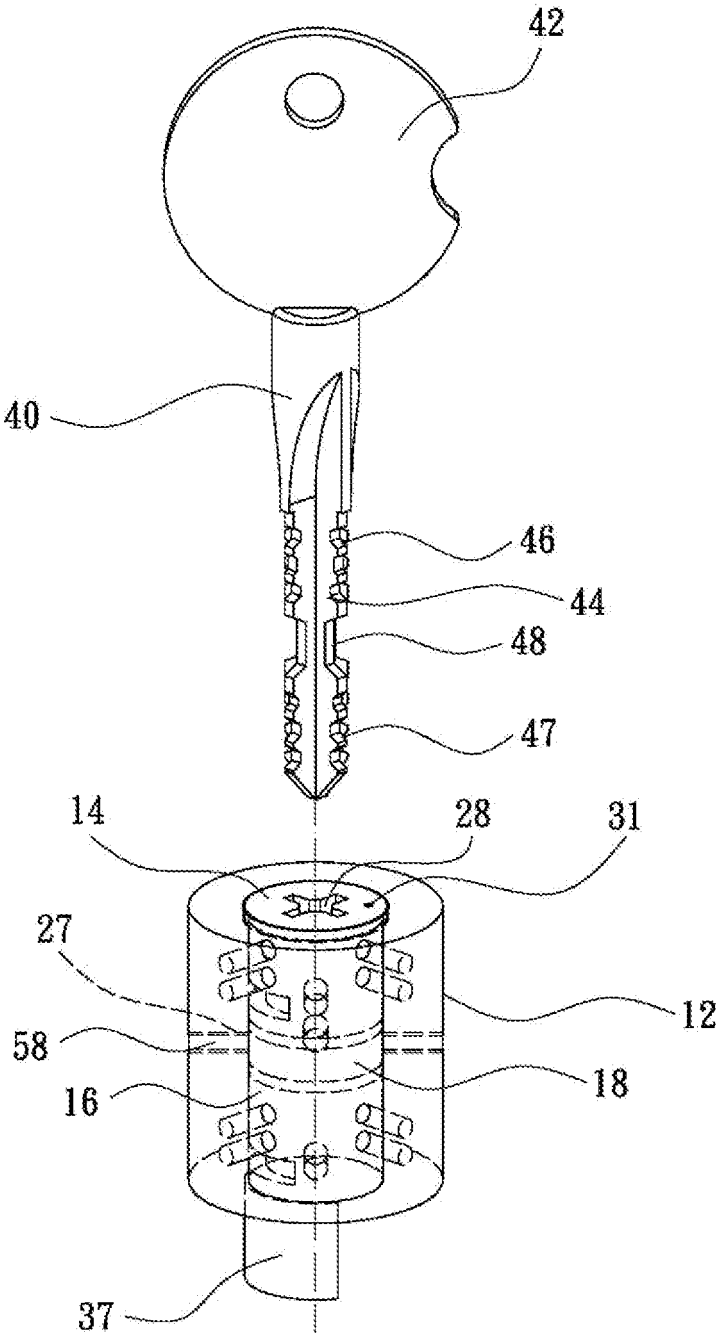

Fig. 2

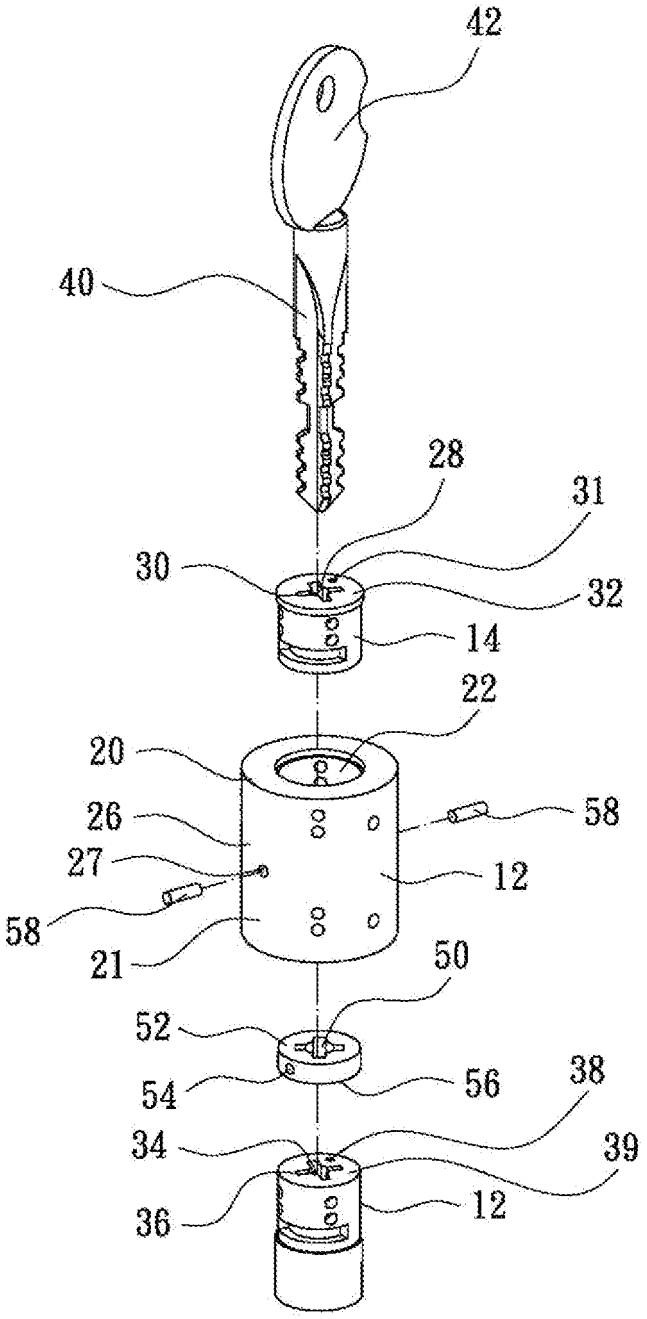

Fig. 3

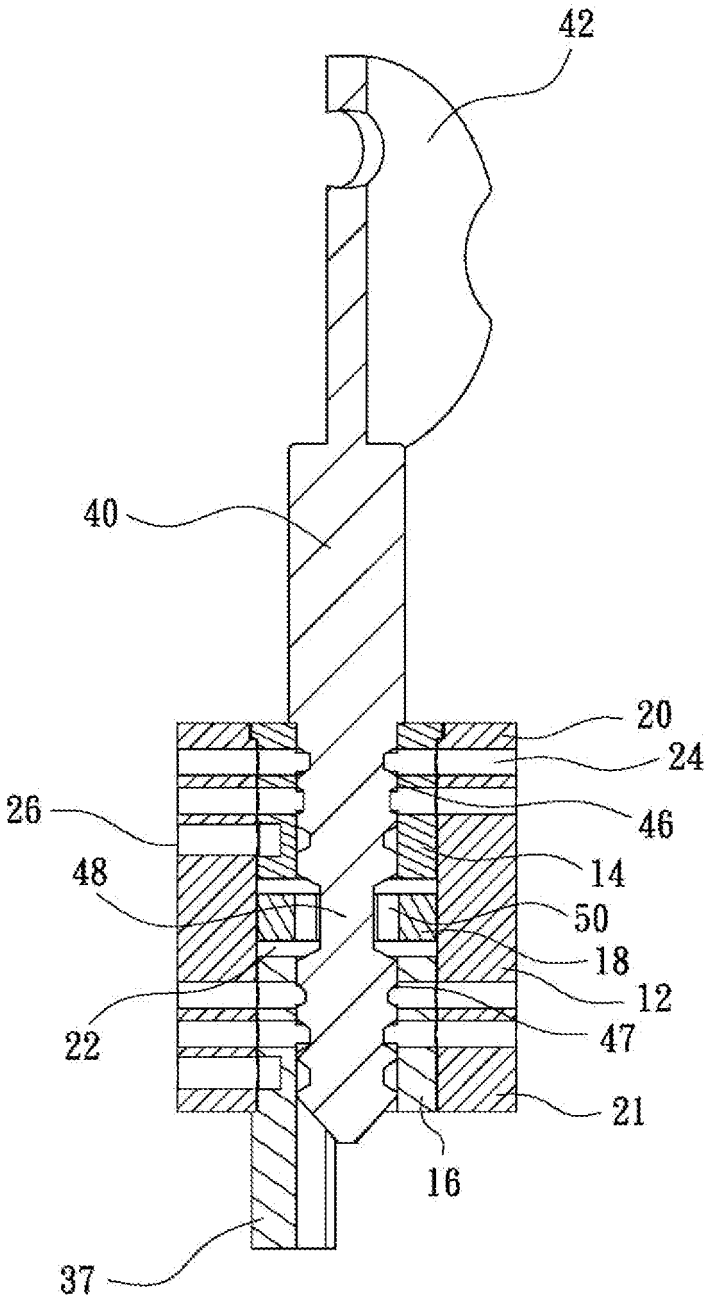

Fig. 4

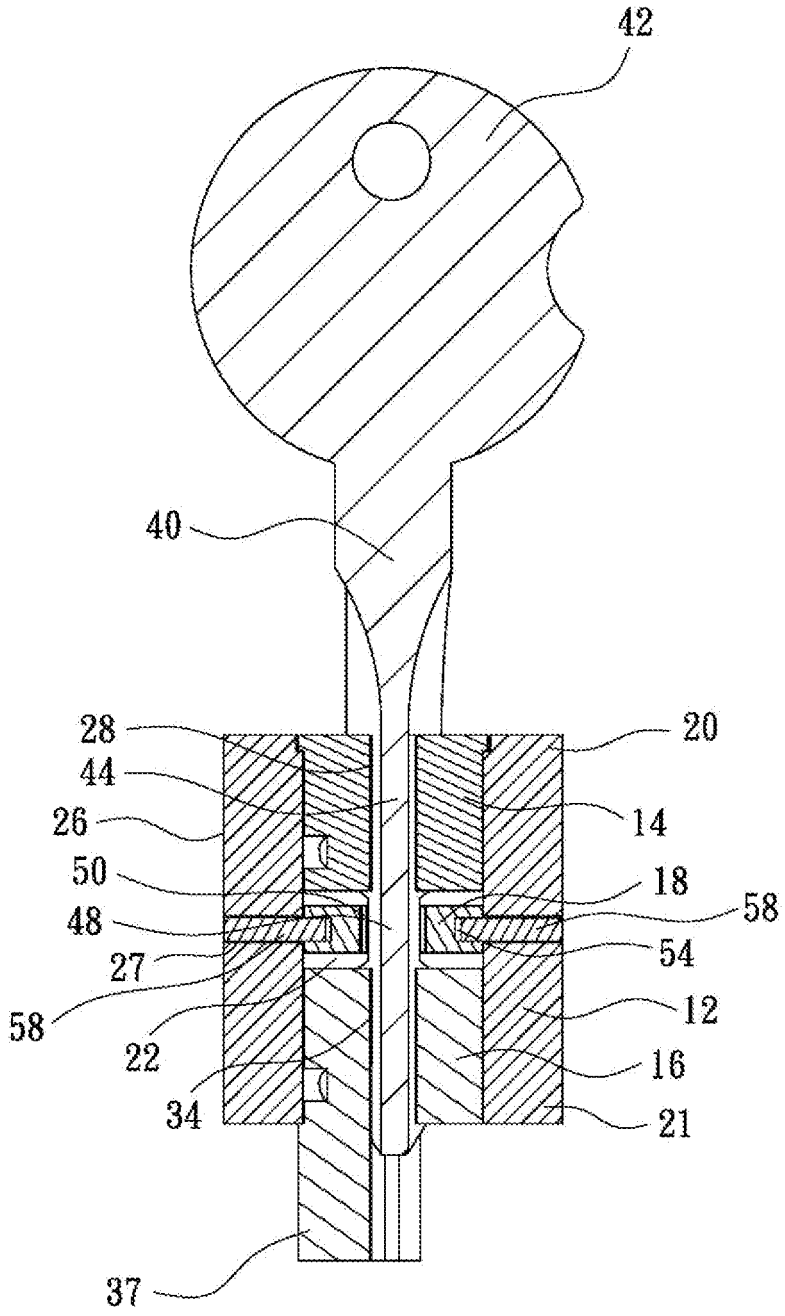

Fig. 5

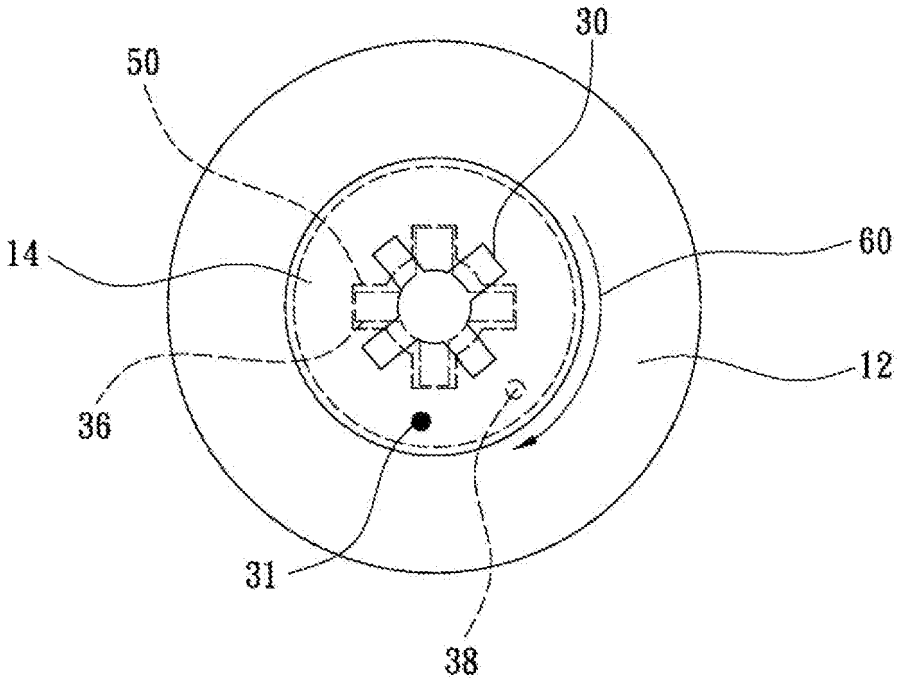

Fig. 6

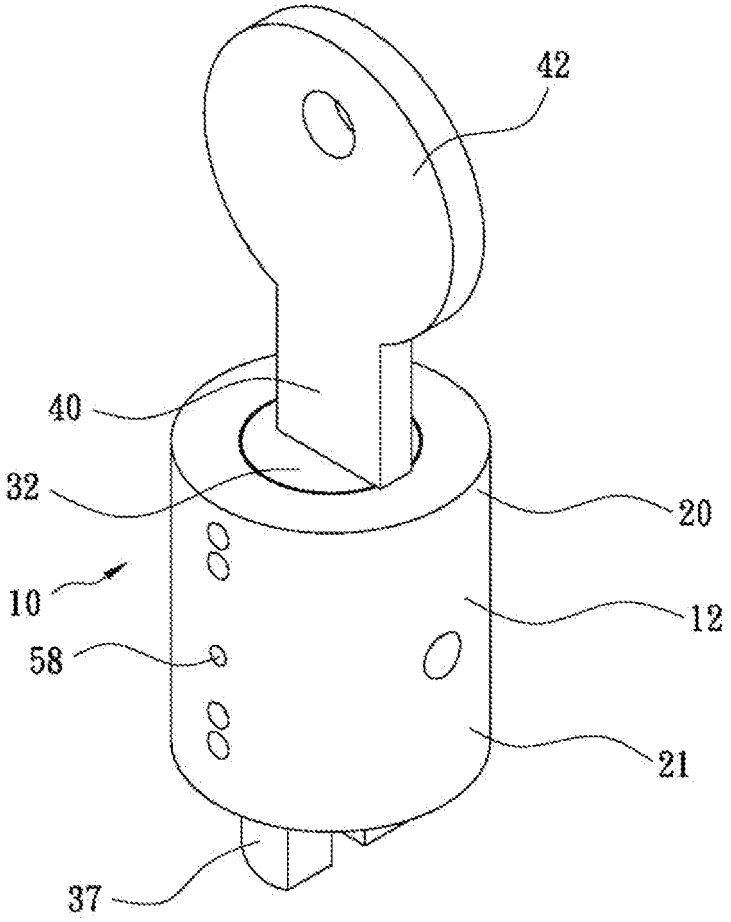

Fig. 7

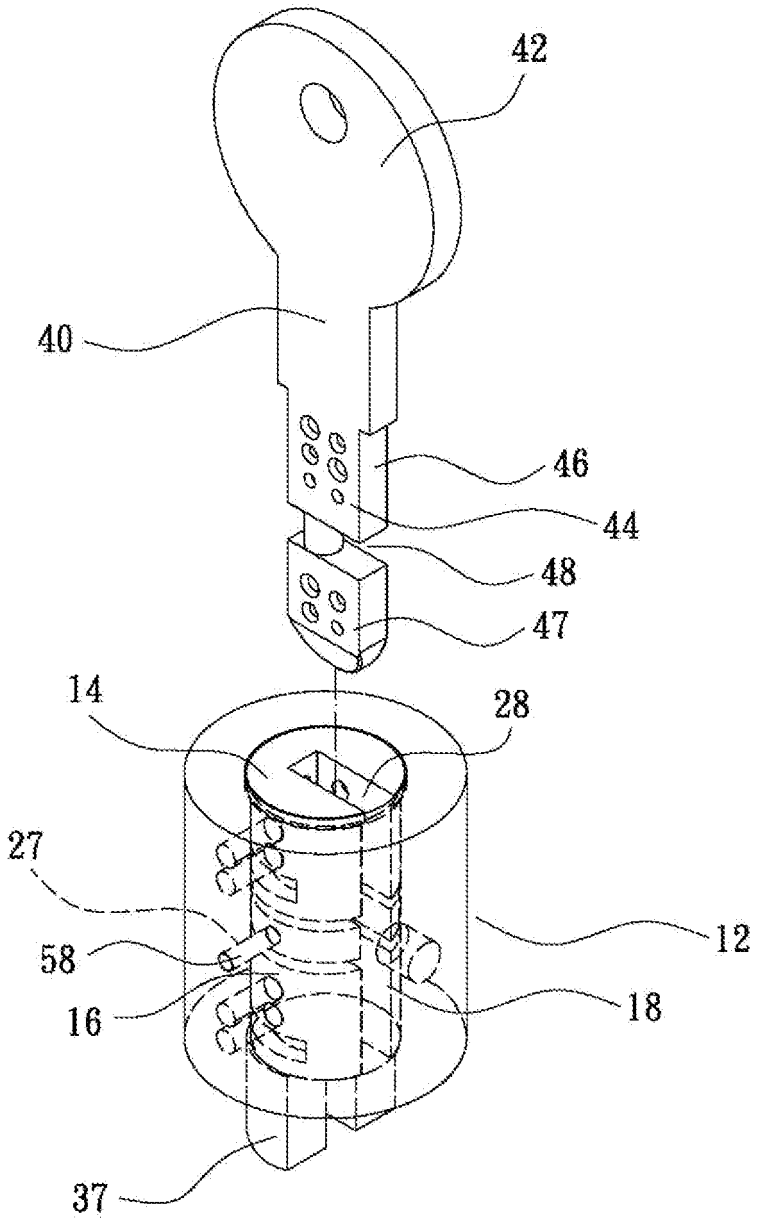

Fig. 8

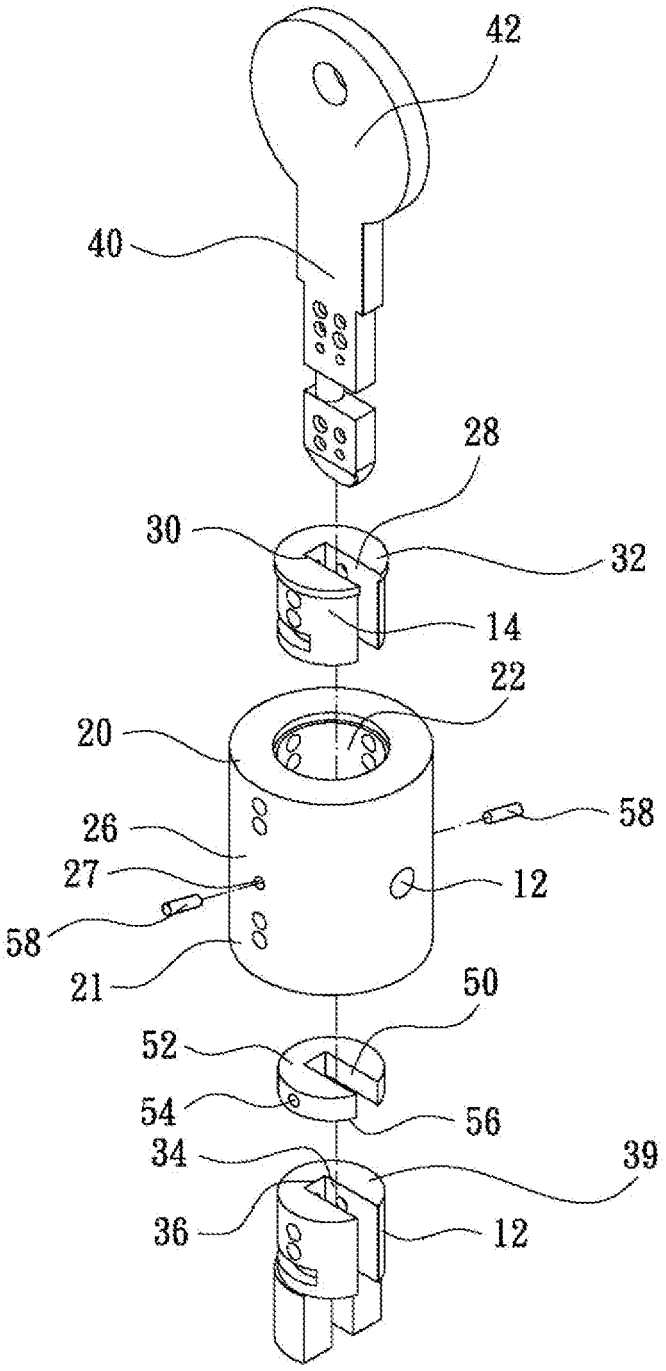

Fig. 9

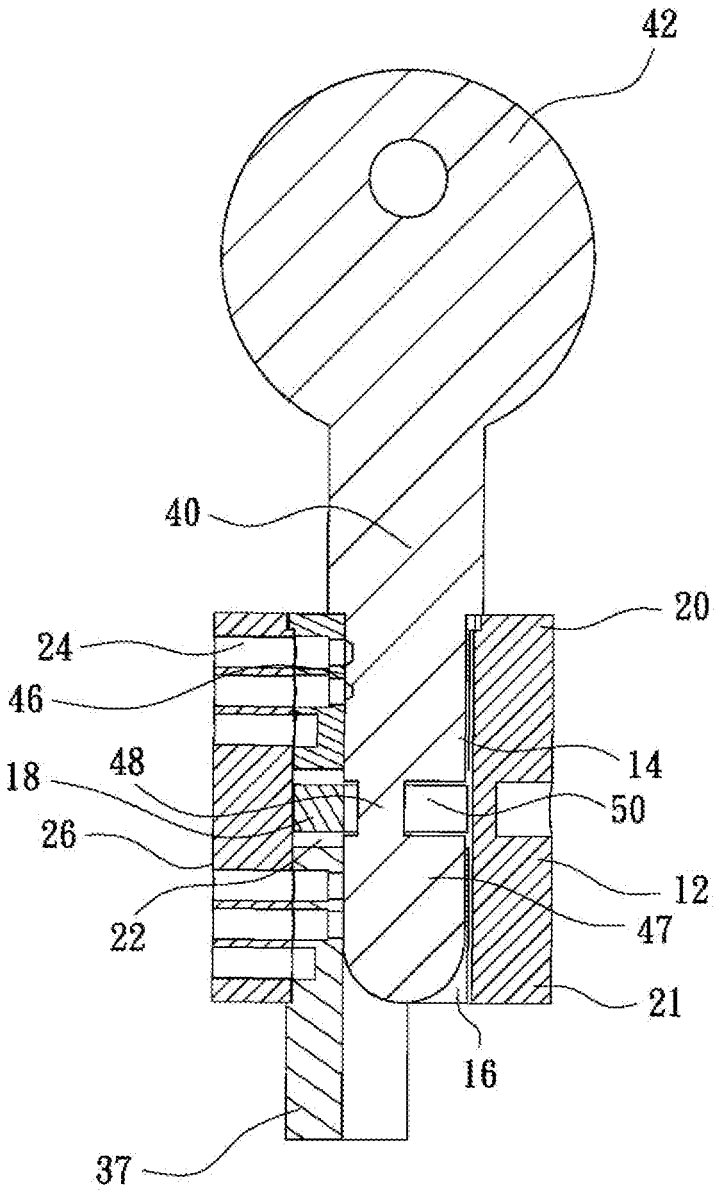

Fig. 10

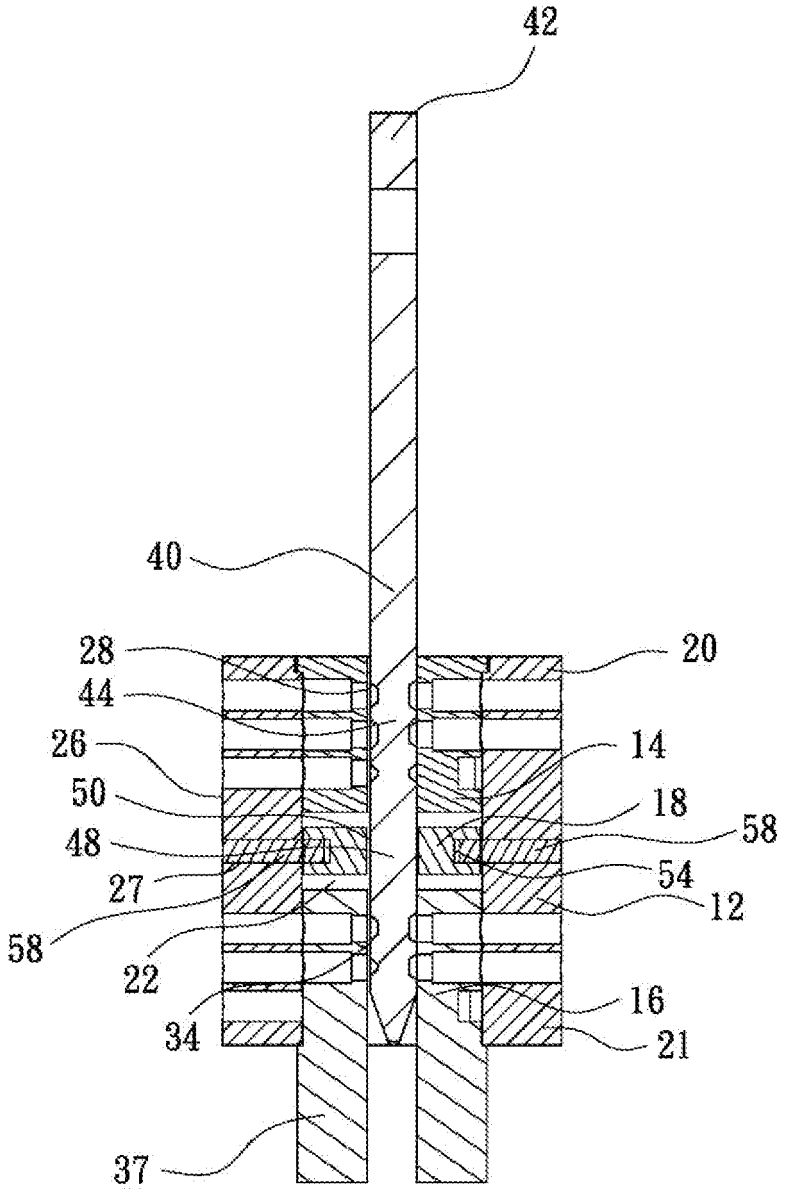

Fig. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2014/073126

A. CLASSIFICATION OF SUBJECT MATTER

E05B 27/10 (2006.01) i; E05B 15/00 (2006.01) i
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E05B 15/-; E05B 19-35/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, CNKI, WPI, EPODOC: shen, lisi, lock, core, key, three, middle, interdict+, block, securing

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 2256911 Y (QIU, Shunming) 25 June 1997 (25.06.1997) description, paragraphs [0014] and [0015], and figures 1 and 2	1-5
PX	CN 203374076 U (SHEN, Lisi) 01 January 2014 (01.01.2014) the whole document	1-5
A	PT 81489 A (UAN CAMER) 01 December 1985 (01.12.1985) the whole document	1-5

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 May 2014	09 July 2014

Name and mailing address of the ISA	Authorized officer
State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	CHAI, Guorong Telephone No. (86-10) 62084951

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2014/073126

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 2256911 Y	25 June 1997	None	
CN 203374076 U	01 January 2014	None	
PT 81489 A	01 December 1985	None	

Form PCT/ISA /210 (patent family annex) (July 2009)