

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 May 2009 (07.05.2009)

PCT

(10) International Publication Number
WO 2009/055881 A1

(51) International Patent Classification:
E05B 17/00 (2006.01)

(21) International Application Number:
PCT/BG2008/000019

(22) International Filing Date: 21 October 2008 (21.10.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
109984 30 October 2007 (30.10.2007) BG

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA,
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE,
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TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report

(54) Title: CYLINDER LOCK

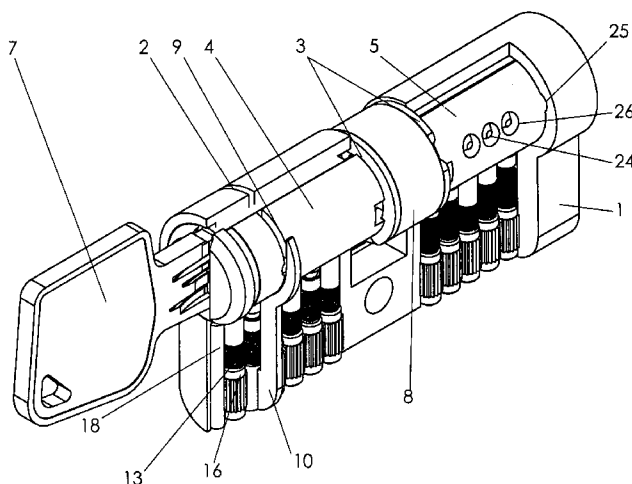


Fig.1.

(57) Abstract: The invention relates to cylinder lock, which can be implemented in the locking devices with increased security for living houses, etc. buildings. The cylinder lock comprises housing (1), outer core (4) and inner core (5) with identical lengths fixed thereto by rings (3), between said cores a cam (8) is freely mounted. In the coaxial formed basic bores (11) and (12) respectively in the housing (1) and in the outer core (4) and in the inner core (5) there are disposed closing pins (16), springs (13), housing pins (14) and core pins (15). Throughout one of the basic bores (12) of the outer core (4) there is formed an additional slot (9) arranged in the same plane with the slot (2) formed in the front part of the housing (1) so that one common slot forms providing a weakened cross section wherein a plastic holder (10) is mounted closing the common slot so that therein a spring (13), a housing pin (14) and a core pin (15) are placed.

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CYLINDER LOCK

Technical field

The invention relates to a cylinder lock, which can be implemented in the
5 field of light industry, especially in the field of the locking devices for residential
houses, public buildings etc.

Prior art

Cylinder lock is known from BG No. 62182, consisting of a housing with
10 an inner and an outer cylinder core fixed by rings thereto, as in the housing and
in the inner core, which is longer than the outer core, there are formed coaxial
bores wherein springs, housing and core pins are placed and on the outer part
of the housing and on one of the cores there are stuffed additional steel inserts,
and on the inner core there is mounted a cam fixed by a spring and a pin, as in
15 the front part of the housing there is formed a slot providing a weaken cross
section which guarantee that in case of a burglary attack the cylinder lock will
break in the intended place, thereby the access to the opening of the lock and
its unlocking is impossible as this opening rests filled with the housing of the
cylinder lock which continues to operate with its original key even after the
20 burglary attack. Said cylinder lock has a disadvantage – the cam whereby the
locking and unlocking are realized is fixed on the inner core and the relevant
locking and unlocking is possible only through the inner core by using two
different keys – a short key to lock and unlock inside and a long key to lock and
unlock outside. This is uncomfortable not only for the customer, but it limits the
25 cylinder lock application. Only double-side cylinder lock could be performed,
besides with limited length of the housing.

Summary of the invention

The present invention seeks to provide an improved construction of a
30 cylinder lock having an increased protection against burglary as the locking and

unlocking operations inside and outside are realized with the same key with keeping the number of the locking combinations.

There is thus provided a cylinder lock, consisting of a housing, a cam, in the front part of the housing there is a slot, as an inner and an outer cylinder core are fixed by rings thereto, said cores have a key channel for the key insertion, as in the housing and in the inner core coaxial basic bores are formed wherein closing pins, springs, housing and core pins are placed. In the outer part of the housing and in the front part of the outer core there are stuffed inserts of a hardened metal which have a protection function against drilling.

In accordance with the invention the cam is freely mounted between the inner and the outer core which both have identical lengths. Also, in the outer core there are formed basic bores which are coaxial with relevant basic bores formed in the housing, wherein closing pins, springs, housing and core pins are placed. Throughout one of the basic bores of the outer core there is formed an additional slot arranged in the same plane with the slot formed in the housing, so that one common slot forms providing a weaken cross section wherein a plastic holder is mounted closing the common slot, so that therein a spring, a housing and a core pin are placed purposely to keep the number of locking combinations. With so formed common slot there is realized an anti-breaking protection of the cylinder lock. In the additional slot of the outer core there is formed a radial bore wherein a steel ball is placed to stabilize the outer core rotation, as the diameter of the ball is bigger than the width of the additional slot. Besides, in accordance with the invention an anti-drilling protection is also realized in case of overcoming the anti-breaking protection, as next to the slot formed in the housing and next to the additional slot formed in the outer core there are mounted additional inserts of a hardened metal in relevant coaxial formed bores in the housing and in the outer core, which are chess-disposed to the basic housing and to the basic core bores. In accordance with the invention as well, in planes perpendicular to the plane of the key channel in the outer and in the inner core there are formed additional core bores wherein additional core pins are disposed, and inside the housing there are formed longitudinal

channels with a configuration corresponding to the additional core pins configuration.

According to the invention a variant is given, where the cylinder lock consists of a housing, a cam, in the front part of the housing there is a slot, as an inner and an outer cylinder core are fixed by rings thereto, said cores have a key channel
5 for the key insertion. The outer and the inner core have different lengths. In the housing and in the inner core there are formed coaxial basic bores wherein closing pins, springs, housing and core pins are disposed. In the outer part of the housing and in the front part of the outer core there are stuffed inserts of a hardened metal. In accordance with the invention the cam is freely mounted
10 between the outer and the inner cores. In the back part of the housing there is formed a second slot, as in the outer core there are also formed basic bores which are coaxial with relevant basic bores formed in the housing, wherein closing pins, springs, housing and core pins are placed. Throughout one of the basic bores of the outer core and respectively of the inner core there are formed
15 additional slots arranged in the same plane respectively with the slot formed in the front part of the housing and with the second slot formed in the back part of the housing, so that two common slots form respectively in the front and in the back part of the housing providing a weaken cross section wherein plastic
20 holders are mounted closing the common slots so therein springs, housing and core pins are disposed. In the additional slots of the outer and of the inner core there are formed radial bores, in each of them there is mounted a steel ball, with a diameter bigger than the width of the additional slots. Next to the slot formed in the front part of the housing and next to the second slot formed in the back
25 part of the housing as well as next to the additional slots formed in the outer and in the inner core there are mounted additional inserts of a hardened metal in respectively coaxial formed bores in the housing and in the outer and in the inner core which are chess-disposed to the basic housing bores and to the basic core bores. Besides, in planes perpendicular to the plane of the key
30 channel in the outer and in the inner core there are formed additional bores wherein respectively additional core pins are disposed, and inside the housing

there are formed longitudinal channels with a configuration corresponding to the additional core pins configuration.

The advantage of the cylinder lock in accordance with the invention consists in that with the improved anti-burglary function and with the kept number of the locking combinations the process of locking and unlocking outside and inside
5 realizes by using the same key, both outside and inside the cylinder lock respectively through the outer and the inner core which are independent each other. This gives an opportunity for the product unification as the constructional limitation of the housing length dies out which allows a variation in the lengths of the outer and of the inner core and increases the cylinder lock application.
10

The cylinder lock in accordance with the invention can be implemented in each necessary configuration without size limitation like double, half or knob cylinder and in the master key systems or as a cylinder lock with special function as well.

15

Brief description of the drawings

The present invention will be understood and appreciated more fully from the following enclosed drawings:

Fig. 1 represents an axonometric illustration of a symmetrical cylinder lock (with
20 identical lengths of the inner and the outer core).

Fig. 2 represents a cross-section of a symmetrical cylinder lock.

Fig. 3 represents a view underneath of a symmetrical cylinder lock.

Fig. 4 and fig. 5 represent sections in typical cuts of a symmetrical cylinder lock.

Fig. 6 represents an axonometric illustration of an asymmetrical cylinder lock
25 (with different lengths of the inner and the outer core).

Fig. 7 represents a cross-section of an asymmetrical cylinder lock.

Fig. 8 represents a view underneath of an asymmetrical cylinder lock.

Detailed description of the embodiments

30 One embodiment of the cylinder lock is shown in fig. 1, fig. 2, fig. 3, fig. 4 and fig. 5, whereat the cylinder lock comprises a housing 1, a cam 8, there is a

slot 2 in the front part of the housing 1, as an inner 5 and an outer 4 cylinder core are fixed by rings 3 thereto, which have a channel 6 for a key 7 insertion, as in the housing 1 and in the inner core 5 there are formed coaxial basic bores 11 and 12 wherein closing pins 16, springs 13, housing pins 14 and core pins 15 are placed, as in the outer part of the housing 1 and in the front part of outer core 4 there are stuffed inserts 18 and 17 of a hardened metal, which have a protection function against drilling. The cam 8 is freely mounted between the outer 4 and the inner 5 core, which both have identical lengths, as in the outer core 4 there are also formed basic bores 12 which are coaxial with relevant basic bores 11 formed in the housing 1, wherein closing pins 16, springs 13, housing pins 14 and core pins 15 are placed. Throughout one of the said basic bores 12 of the outer core 4 there is formed an additional slot 9 arranged in the same plane with the slot 2 formed in the housing 1, so that one common slot forms providing a weaken cross section wherein a plastic holder 10 is mounted, closing the common slot, so that therein a spring 13, a housing pin 14 and a core pin 15 are placed purposely to keep the number of the locking combinations. In the additional slot 9 of the outer core 4 there is formed a radial bore wherein a steel ball 19 is mounted with a diameter bigger than the width of the additional slot 9. The said steel ball 19 is intended to stabilize the outer core 4 rotation. Next to the slot 2 and next to the additional slot 9 formed respectively in the housing 1 and in the outer core 4 there are mounted additional inserts of a hardened metal 21 and 20 in relevant coaxial formed bores 23 and 22 in the housing 1 and in the outer core 4 which are chess-disposed to the basic housing bores 11 and to the basic core bores 12. The said additional inserts 21 and 20 are intended to operate as an anti-drilling protection in case of overcoming the anti-breaking protection realized by the slot 2 and the additional slot 9. In planes perpendicular to the plane of the key channel 6 in the outer core 4 and in the inner core 5 there are formed additional bores 26 wherein additional core pins 24 are disposed and inside the housing 1 there are formed longitudinal channels 25 with a configuration corresponding to the additional core pins 24 configuration.

Another embodiment of the cylinder lock is shown in fig. 6, fig. 7 and fig. 8, whereat the cylinder lock consists of a housing 1', a cam 8, there is a slot 2 in the front part of the housing 1', as an outer 4' and an inner 5' cylinder core are fixed by rings 3 thereto, which have a channel 6 for a key 7 insertion. The outer 5 4' and the inner 5' cores have different lengths. In the housing 1' and in the inner core 5' coaxial basic bores 11 and 12 are formed wherein closing pins 16, springs 13, housing pins 14 and core pins 15 are placed, as in the outer part of the housing 1' and in the front part of the outer core 4' there are stuffed inserts 18 and 17 of a hardened metal. The cam 8 is freely mounted between the outer 10 4' and the inner 5' core. In the back part of the housing 1' there is formed a second slot 2', as in the outer core 4' there are formed also basic bores 12 which are coaxial with relevant basic bores 11 formed in the housing 1' wherein closing pins 16, springs 13, housing pins 14 and core pins 15 are disposed. Throughout one of the said basic bores 12 of the outer core 4' and respectively 15 of the inner core 5' there are formed additional slots 9 and 9' arranged in the same plane respectively with the slot 2 and with the second slot 2' formed in the front and in the back part of the housing 1' so that two common slots form respectively in the front and in the back part of the housing 1' providing a weaken cross section wherein plastic holders 10 are mounted closing the 20 common slots so that wherein springs 13, housing pins 14 and core pins 15 are placed. In the additional slots 9 and 9' of the outer 4' and of the inner core 5' there are formed radial bores, in each of them there is mounted a steel ball 19, with a diameter bigger than the width of the additional slots 9 and 9'. Next to the slot 2 and next to the second slot 2' formed in the housing 1' and next to the 25 additional slots 9 and 9' formed respectively in the outer core 4' and in the inner core 5', there are mounted additional inserts of a hardened metal 21 and 20 in relevant coaxial formed bores 23 and 22 in the housing 1' and in the outer core 4' and in the inner core 5' which are chess-disposed to the basic housing bores 11 and to the basic core bores 12. Moreover, in planes perpendicular to the 30 plane of the key channel 6 in the outer core 4' and in the inner core 5' there are formed additional bores 26 wherein respectively additional core pins 24 are

disposed and inside the housing 1' there are formed longitudinal channels 25 with a configuration corresponding to the additional core pins 24 configuration. In this embodiment the execution of slots on both cylinder lock sides is necessary, because the assembly way of the cylinder lock is not known
5 beforehand, and to guarantee its anti-burglary function it is necessary the formed common slot to be executed outside the lock during its assembly.

Implementation of the invention

In accordance with the invention the cylinder lock using the associated
10 key, operates as follows. When lock or unlock the cylinder lock outside or inside, the associated key 7 according to fig. 1, 2, 3, 4 and 5 inserts into the key channel 6 of the outer core 4 or of the inner core 5, whereat the core pins 15 and the additional core pins 24, being engaged in the relevant code combination on the key 7, fall respectively in the outer core 4 or in the inner
15 core 5 and make possible their rotation in locking or unlocking direction. However, if the code combination on the key 7 is inaccurate, when the key 7 inserts into the key channel 6 of the outer 4 or of the inner 5 core, the core pins 15 don't fall in the respective core, and/or the additional core pins 24 block in the longitudinal channels 25 in the housing, which makes the rotation of the
20 relevant core impossible, respectively the locking/ unlocking operations are also impossible.

CLAIMS

1. Cylinder lock comprising a housing (1), a cam (8), in the front part of the housing (1) there is a slot (2), as to the housing (1) there are fixed by rings (3) an outer core (4) and an inner core (5) which have a channel (6) for a key (7) insertion, as in the housing (1) and in the inner core (5) there are formed coaxial basic bores (11) and (12) wherein closing pins (16), springs (13), housing pins (14) and core pins (15) are placed, as in the outer part of the housing (1) and in the front part of the outer core (4) there are stuffed inserts (18) and (17) of a hardened metal, characterized in that the cam (8) is freely mounted between the outer (4) and the inner (5) core which both have identical lengths, as in the outer core (4) there are also formed basic bores (12) which are coaxial with relevant basic bores (11) formed in the housing (1) wherein closing pins (16), springs (13), housing pins (14) and core pins (15) are placed, as throughout one of the said basic bores (12) of the outer core (4) there is formed an additional slot (9) arranged in the same plane with the slot (2) formed in the housing (1), so that one common slot forms providing a weaken cross section wherein a plastic holder (10) is mounted closing the common slot so that therein a spring (13), a housing pin (14) and a core pin (15) are placed, as in the additional slot (9) of the outer core (4) there is formed a radial bore wherein a steel ball (19) is mounted, at that next to the slot (2) and next to the additional slot (9) formed respectively in the housing (1) and in the outer core (4) there are mounted additional inserts of a hardened metal (21) and (20) in relevant coaxial formed bores (23) and (22) in the housing (1) and in the outer core (4) which are chess-disposed to the basic housing bores (11) and to the basic core bores (12), as at that in planes perpendicular to the plane of the key channel (6) in the outer core (4) and in the inner core (5) there are formed additional bores (26) wherein respectively additional core pins (24) are disposed and inside

the housing (1) there are formed longitudinal channels (25) with a configuration corresponding to the additional core pins (24) configuration.

2. A cylinder lock, according to claim 1, characterized in that the steel ball (19)
5 has a diameter which is bigger than the width of the additional slot (9).
3. Cylinder lock comprising a housing (1'), a cam (8), in the front part of the housing (1') there is a slot (2), as to the housing (1') there are fixed by rings (3) an outer core (4') and an inner core (5') having a channel (6) for a key (7)
10 insertion, the outer (4') and the inner (5') cores are with different lengths, as in the housing (1') and in the inner core (5') there are formed coaxial basic bores (11) and (12) wherein closing pins (16), springs (13), housing pins (14) and core pins (15) are placed, as in the outer part of the housing (1') and in the front part of the outer core (4') there are stuffed inserts (18) and
15 (17) of a hardened metal, characterized in that the cam (8) is freely mounted between the outer (4') and the inner (5') core ; as in the back part of the housing (1') there is formed a second slot (2'), as in the outer core (4') there are also formed basic bores (12) which are coaxial with relevant basic bores (11) formed in the housing (1') wherein closing pins (16), springs (13),
20 housing pins (14) and core pins (15) are disposed, as throughout one of the said basic bores (12) of the outer core (4') and respectively of the inner core (5') there are formed additional slots (9) and (9') arranged in the same plane respectively with the slot (2) and with the second slot (2') formed in the front and in the back part of the housing (1') so that two common slots form
25 respectively in the front and in the back part of the housing (1') providing a weaken cross section wherein plastic holders (10) are mounted closing the common slots so that therein springs (13), housing pins (14) and core pins (15) are placed, as in the additional slots (9) and (9') of the outer core (4') and of the inner core (5') there are formed radial bores, in each of them
30 there is mounted a steel ball (19), as at that next to the slot (2) and next to

the second slot (2') formed in the housing (1') and next to the additional slots (9) and (9') formed in the outer core (4') and in the inner core (5'), there are mounted additional inserts of a hardened metal (21) and (20) in relevant coaxial formed bores (23) and (22) in the housing (1') and in the outer core (4') and in the inner core (5') which are chess-disposed to the basic housing bores (11) and to the basic core bores (12) as at that in planes perpendicular to the plane of the key channel (6) in the outer core (4') and in the inner core (5') there are formed additional bores (26) wherein respectively additional core pins (24) are disposed and inside the housing (1') there are formed longitudinal channels (25) with configuration corresponding to the additional core pins (24) configuration.

4. A cylinder lock, according to claim 3, characterized in that the steel ball (19) has a diameter which is bigger than the width of the additional slots (9) and (9').

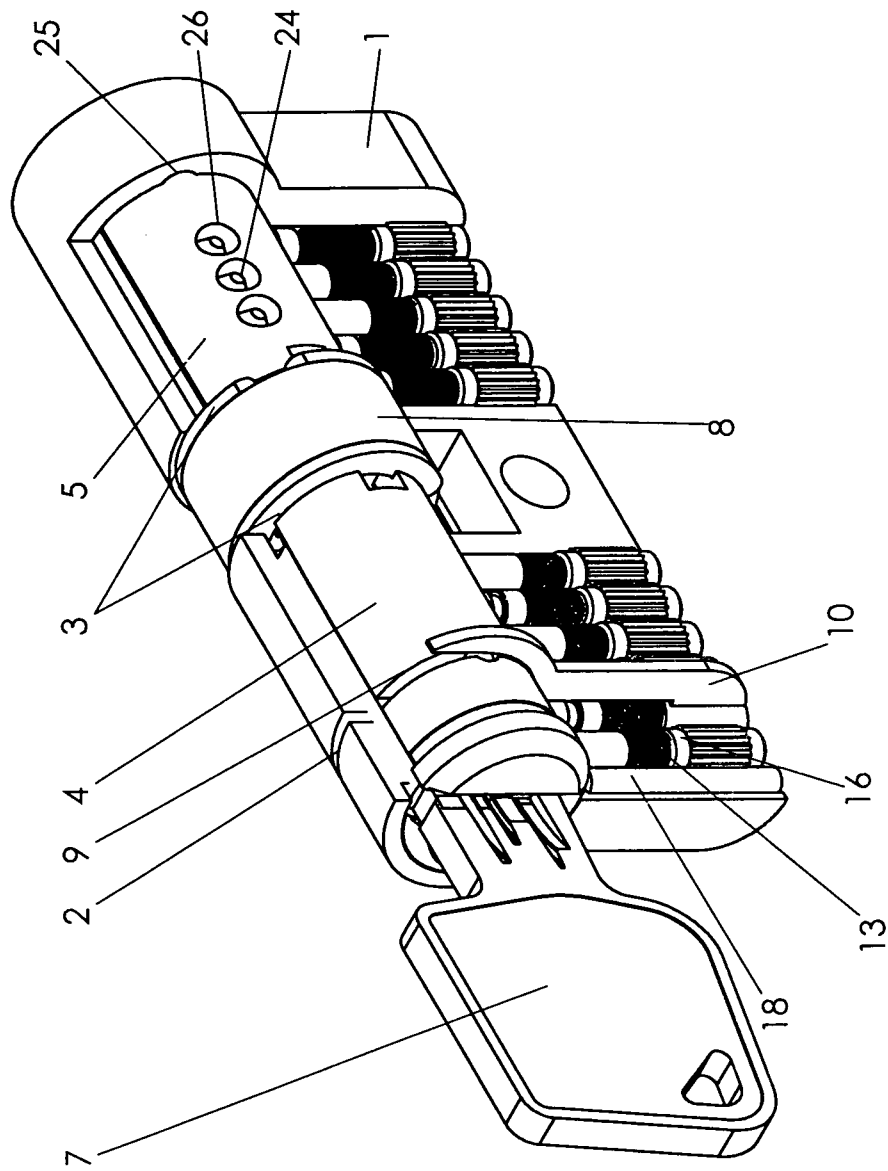


Fig.1.

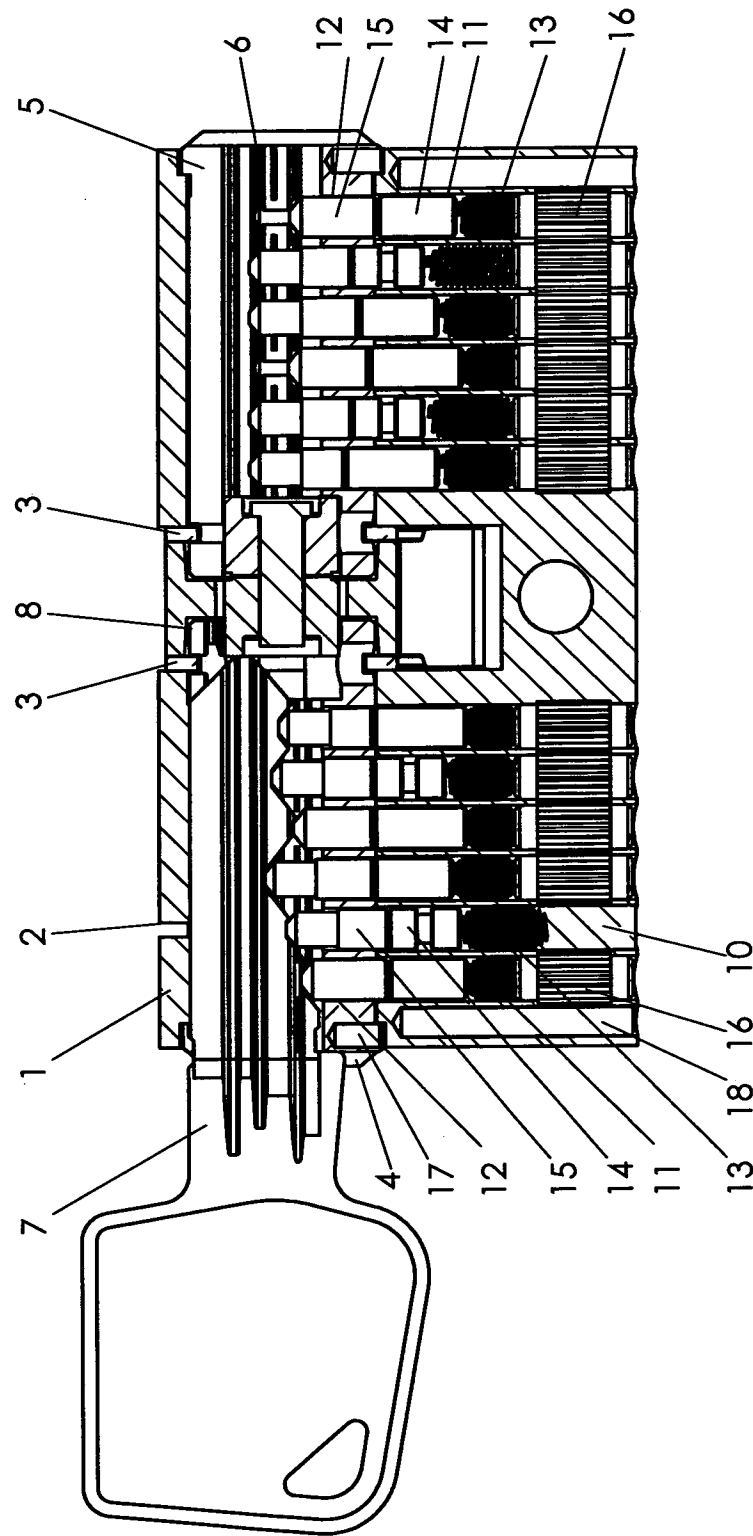


Fig.2

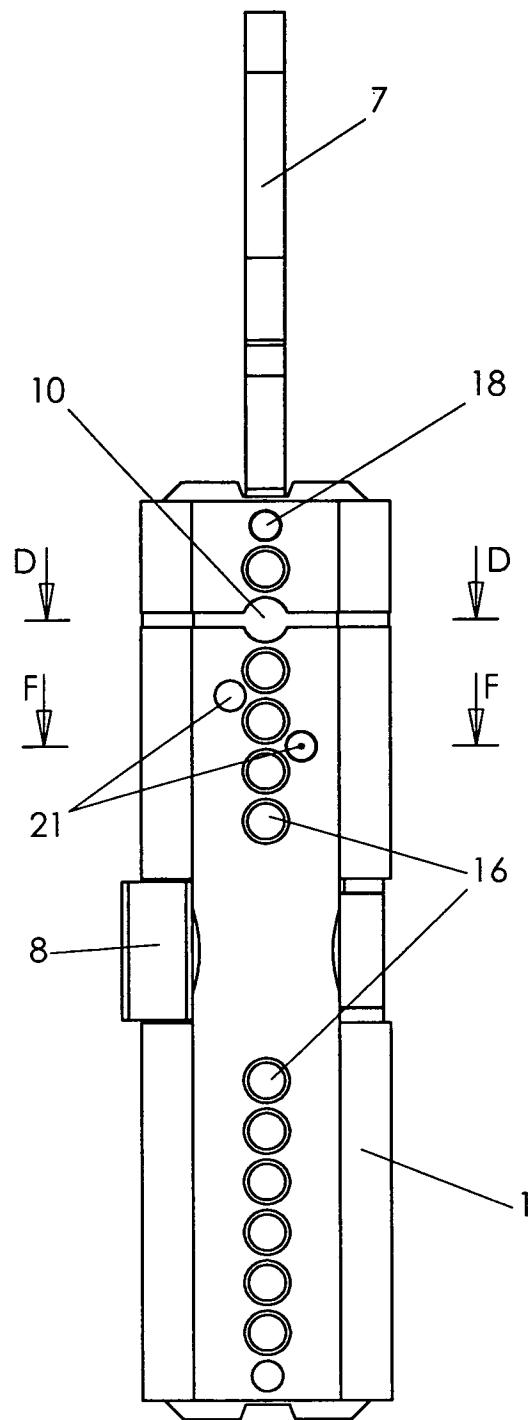


Fig.3.

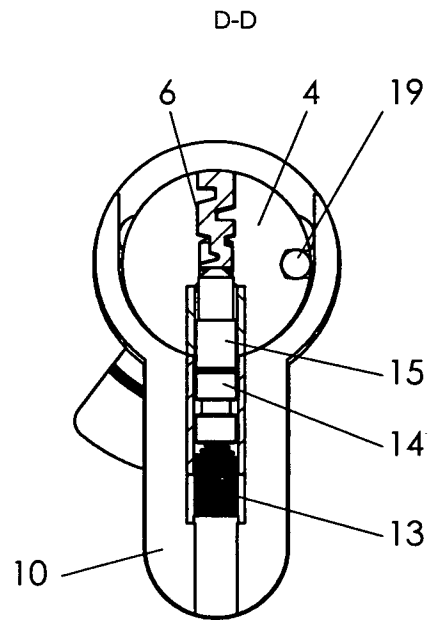


Fig.4.

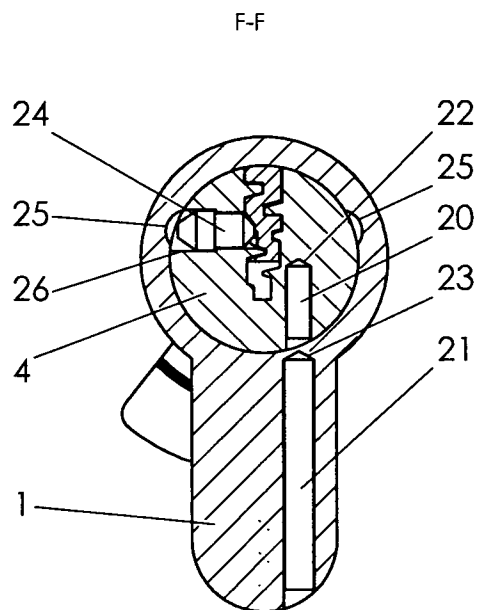


Fig.5.

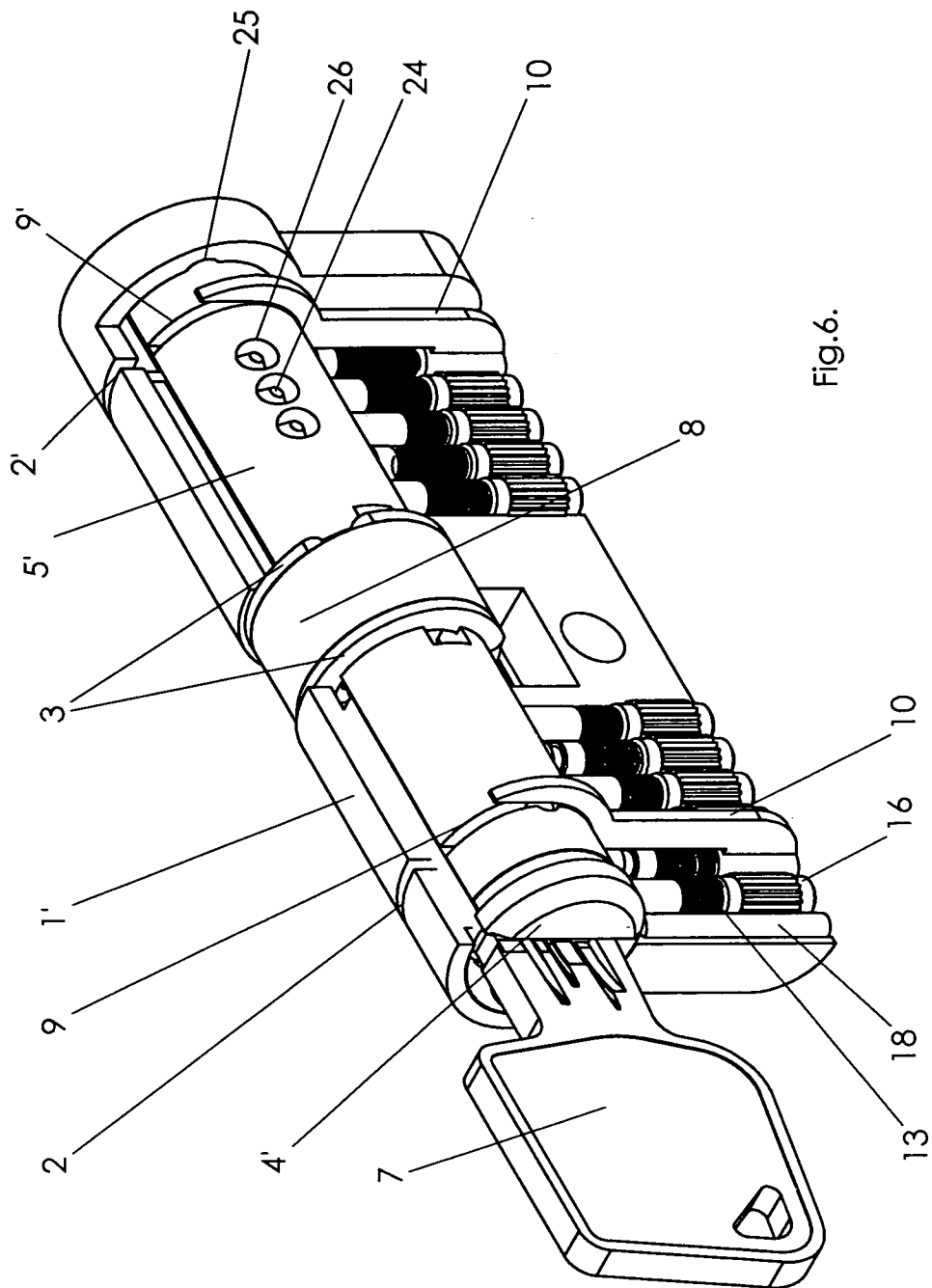


Fig. 6.

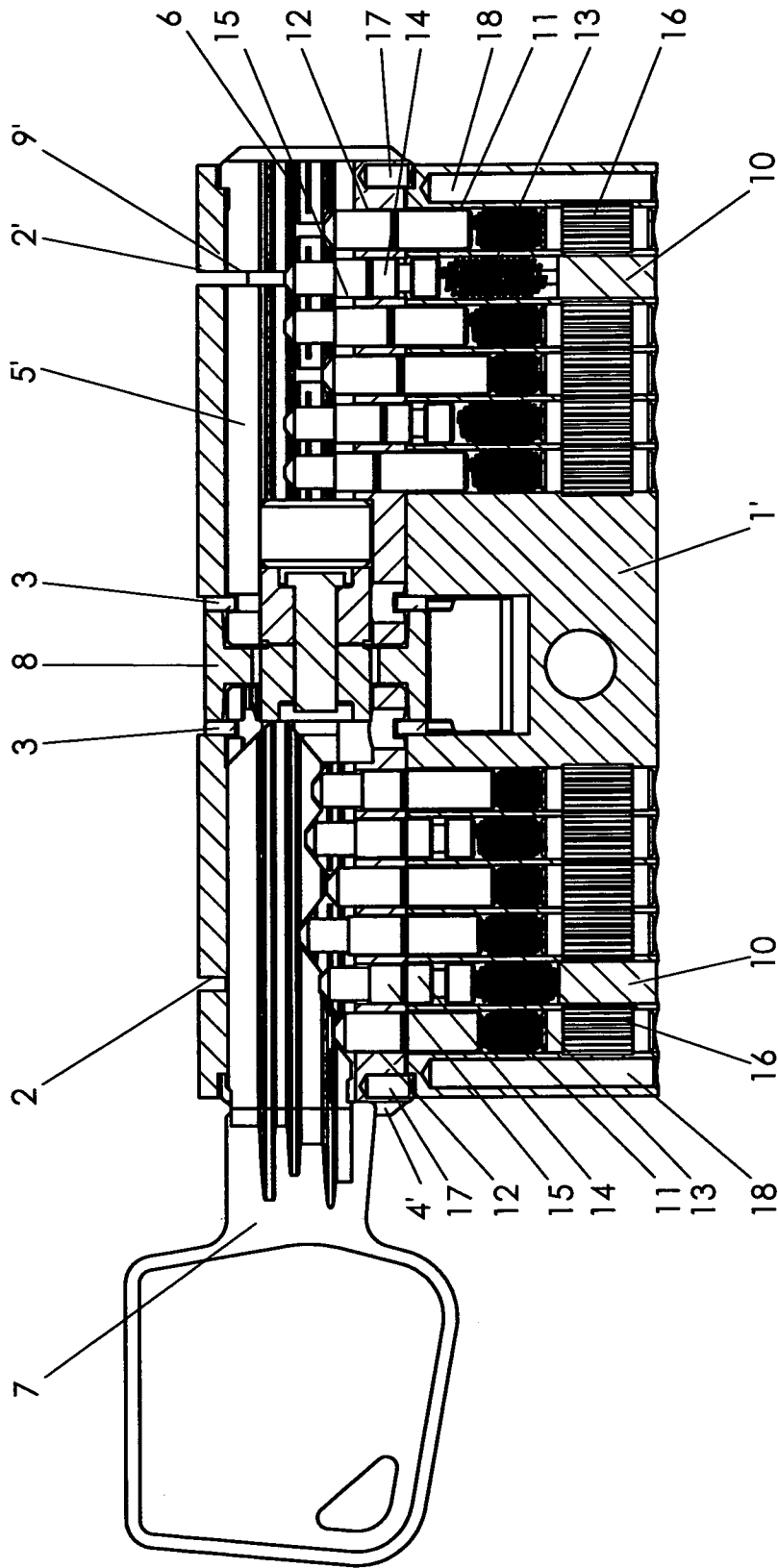


Fig.7

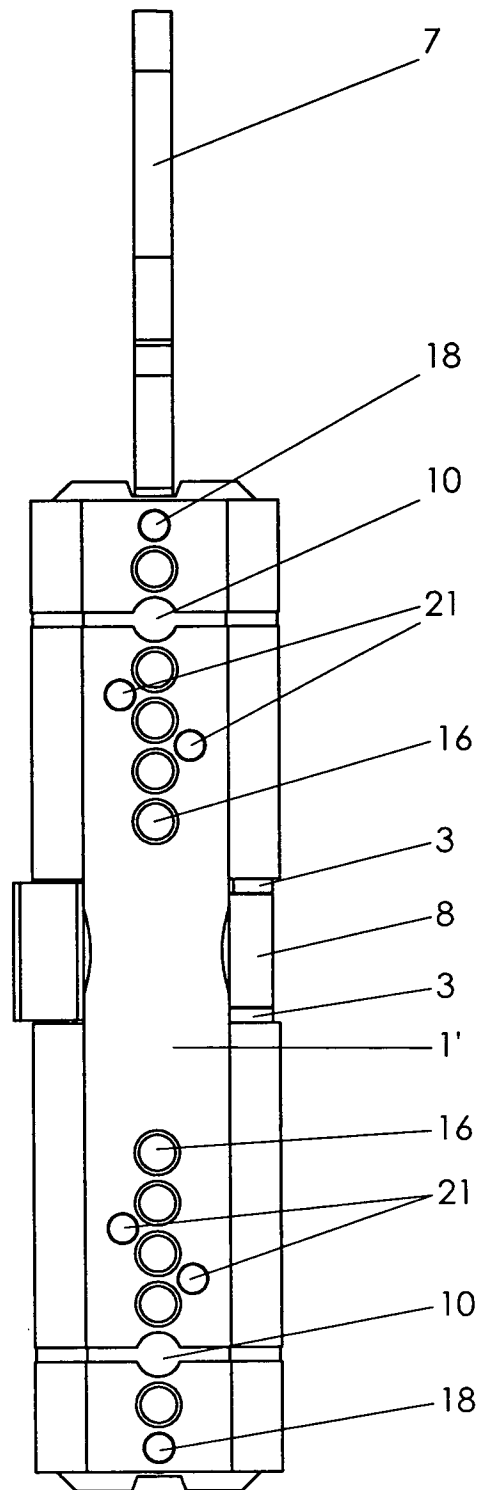


Fig.8.

INTERNATIONAL SEARCH REPORT

International application No

PCT/BG2008/000019

A. CLASSIFICATION OF SUBJECT MATTER

INV. E05B17/00

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

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 298 08 432 U1 (AUGUST KNAPP SCHLIESTECHNIK GM [DE]) 30 July 1998 (1998-07-30) figures 1-25	1
A	BG 62 182 B1 (KOLEV KOLAO M [BG]; KARACHODZHUKOV IVAN V [BG]) 30 April 1999 (1999-04-30) cited in the application the whole document	1
A	DE 28 22 132 A1 (KARRENBURG FA WILHELM) 22 November 1979 (1979-11-22) figures 1-4	1
A	DE 100 11 102 A1 (WILKA SCHLIESTECHNIK GMBH [DE]) 13 September 2001 (2001-09-13) figure 9	1, 3
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Date of the actual completion of the international search

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Date of mailing of the international search report

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Geerts, Arnold

INTERNATIONAL SEARCH REPORT

International application No

PCT/BG2008/000019

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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AT 8244	U1	15-04-2006	NONE		