



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.02.2010 Bulletin 2010/08

(51) Int Cl.:
E05B 63/12 ^(2006.01) **E05B 15/10** ^(2006.01)
E05B 59/00 ^(2006.01)

(21) Application number: **08162511.3**

(22) Date of filing: **18.08.2008**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**
Designated Extension States:
AL BA MK RS

(72) Inventor: **Özgen, Ergin**
34610 Istanbul (TR)

(74) Representative: **Sevinç, Erkan**
Istanbul Patent & Trademark Consultancy Ltd.
Plaza-33, Büyükdere cad. No: 33/16
Sisli
34381 Istanbul (TR)

(71) Applicant: **KALE Kilit ve Kalip Sanayi A.S.**
34610 Istanbul (TR)

(54) **Improved lock with latches having elliptical head portions**

(57) The present invention proposes a lock mechanism with at least one linear latching element having a head portion (13) suitable for engaging with a respective door frame lock panel slot in the direction the latch displace to lock the door. Engaging of said head portions (13) with said slots ensure that releasing of the latch by

forcibly moving it in the direction of the lock assembly or door frame is prevented. The latches having a regular linear structure according to the present invention are adapted to displace in a rotational manner around their axes by means of a pin secured to the latch body and guided on a non-linear channel to effect rotation.

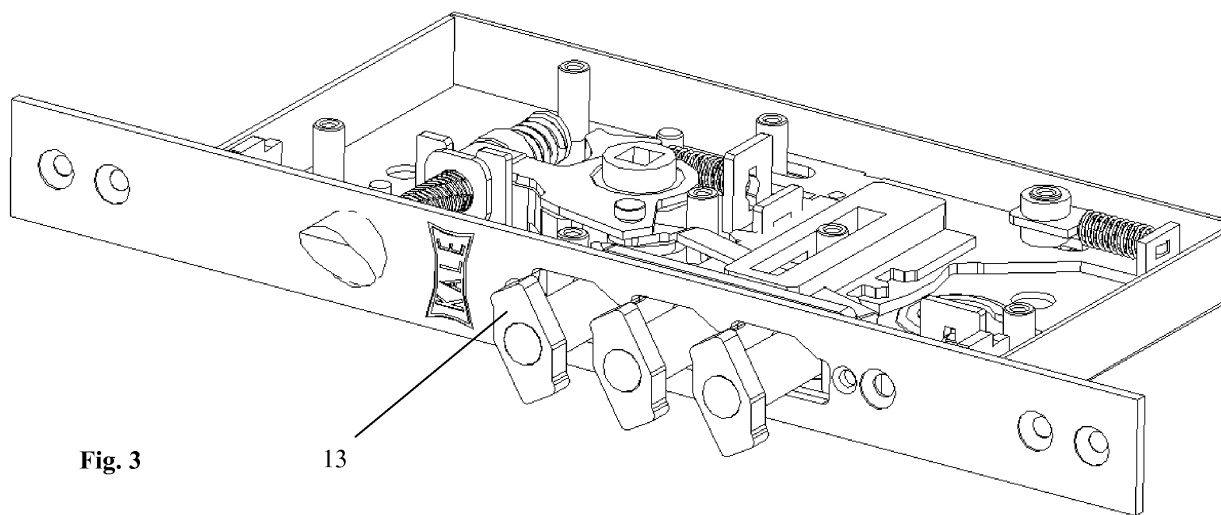


Fig. 3

13

Description

Technical Field of the Invention

[0001] The present invention relates to an improved lock mechanism having elliptical latch heads for locking said latch with respective slots in more than one plane.

Background of the Invention

[0002] In a standard locking assembly, a latch is typically advanced into a door frame slot to prevent displacement of the door on the direction perpendicular to the door plane itself. A further approach for effecting locking of a door may be by way of equipping the lock mechanism with curvilinear latches, which are in the form of hook-shaped latches providing multiple axes locking so as to withstand both vertical and horizontal forces produced in association with and during burglary attempts. For instance, WO 2006/120210 relates to a lock mechanism having curvilinear latches.

[0003] The present invention combines the simplicity of a regular linear latch with the effectiveness of a curvilinear latch, which also prevents displacement of the locking mechanism on the direction the latches advance into the respective slots on the door frame lock panel. This provides a better protection against burglary attempts and substantially delays or fully prevents releasing of the lock mechanisms by unauthorized individuals.

[0004] The present invention therefore provides a simple latch structure which displace linearly and rotates around its axis to enable engaging of its elliptical head portions into the respective door frame lock panel slots. Therefore a simultaneously linear and rotational movement is imparted to the latches according to the present invention. Rotational movement is achieved by way of a pin secured to the latch mechanism and guided in a non-linear channel.

[0005] Interlocking of the latch heads with the slots in more than one direction is especially advantageous in cases where separation of the latches from said slots is relatively easier by applying pressure on the door frame body on which said slots extend by collapsing said frame body by means of, for instance a perpetual screw so as to ultimately release said lock latches. It is a well-known fact that various techniques are used for releasing a door lock in burglary attempts. One of those techniques is to employ a perpetual screw or endless screw, like that of a jack, a screw that is fixed so that it cannot move longitudinally as it rotates. Accordingly, once fixed at two sides of the door frame at a position parallel to the door surface, it remains stationary and forces the door frame to bend toward hollow spaces within the frame. This can eventually bend the frame to the extent that latches are released from said slots.

Objects of the Invention

[0006] One of the prominent objects of the present invention is to provide a lock mechanism having linear latches adapted to rotate around their axes so as to effect rotation of the elliptical head portions thereof.

Summary of the Invention

[0007] The present invention proposes a lock mechanism with at least one linear latching element having a head portion suitable for engaging with a respective door frame lock panel slot in the direction the latch displaces to lock the door. Engaging of said head portions with said slots ensure that releasing of the latch by forcibly moving it in the direction of the lock assembly or door frame is prevented. The latches having a regular linear structure according to the present invention are adapted to displace in a rotational manner around their axes by means of a pin secured to the latch body and guided on a non-linear channel to effect rotation.

Brief Description of the Figures

[0008] Accompanying drawings are given solely for the purpose of exemplifying a lock assembly whose advantages over prior art were outlined above and will be explained in detail hereinafter:

Fig. 1 demonstrates a perspective view of the lock assembly according to the present invention in which certain elements of the mechanism are removed to demonstrate axial movement of the latch bodies.

Fig. 2 demonstrates a perspective view of the lock assembly according to the present invention in which all elements are in place.

Fig. 3 demonstrates another perspective view of the lock assembly according to the present invention.

Fig. 4 demonstrates another perspective view of the lock assembly according to the present invention.

Fig. 5 demonstrates another perspective view of the lock assembly in which an embodiment of the present invention with thicker head portions, are utilized.

Fig. 6 demonstrates another perspective view of the lock assembly in which certain elements of the mechanism are removed to demonstrate an embodiment of the present invention with larger non-linear channels.

Detailed Description of the Invention

[0009] Referring now to the figures outlined above, the

lock assembly (11) typically comprises at least one latch (12) for engaging into a respective slot on the door frame lock panel (not shown). Said latches (12) are provided, according to the present invention, with an outermost head portion (13) as in Fig 3. Said head portions (13) are in the form of protrusions around the outermost plane of the tubular latches (12) and extending beyond said outermost plane so as to form an external or peripheral part. This peripheral part (13) completes its partial rotation after the advancement of the latch (12) reaches inside the respective door frame lock panel slot and said head portions (13) therefore engage with said slots (not shown) in the manner to prevent a burglary attempt for forcibly separating said latches (12) from said slots. This is especially advantageous in cases where separation of the latches (12) from said slots is relatively easier by applying pressure on the door frame body on which said slots extend by collapsing said frame body by means of, for instance an perpetual screw so as to ultimately release said lock latches (12).

[0010] According to the present invention, said latches (12) are equipped in the form of a tubular core element (16), onto which a pin (15) is secured with its free end being guided in a non-linear channel (14). Said channel (14) has two linear sections (18, 19) divided by a turn at a point therebetween. Said pin (15) normally extending in a vertical position with respect to the lateral plane of the lock assembly (11) within the first linear section (18) of said channel (14), takes an inclined direction as in Fig. 1 and forces the tubular core (16) to axially rotate starting from said turn point within said second linear section (19). Axial rotation of the tubular core (16) effects rotation of the latch (12) together with the protruding head portion (13). However, axial rotation only beginning at said turning point between said two linear sections (18, 19) ensure that the non-uniform form head portions (13) can enter in the regular (generally rectangular) locking slots in a conventional manner. Linear advancement of the latches (12) during the first section (18) is therefore combined with axial movement in the second sections (19), which provides additional security by locking of the rotated head portions (13) with the slots against a linearly forced releasing attempt.

[0011] Advancing of the latches (13) according to the present invention is conventionally achieved by a drive mechanism comprised of a carrier plate (20) and a position switching plate (21). A cylinder (not shown) in the cylinder hole (17) advances said position switching plate (21) back and forth to effect locking and unlocking of said latches (12). Said carrier plate (21) locks each position of said position switching plate (21) by a vertical element (22) integral to said carrier plate (20) and having an opening for receiving a horizontal projection (23) corresponding to a position of said position switching plate (21).

[0012] The linearly sliding bolt (24) according to the present invention is conventionally controlled by a handle hub in the form of a spring loaded structure actuated by the handle rotating a mechanism transferring motion to

the spring loaded structure. The actuator mechanism of the linear bolt (24) and the transmission mechanism thereof, are widely practiced in the art and need not be further mentioned herein. The behavior of the bolt (24) with regard to the handle hub is apparent to the person skilled in the art.

[0013] As is also apparent to the person skilled in the art, control of said sliding bolt (24) should also be possible through the lock cylinder. To this end, final rotation of the lock cylinder in the unlocking direction moves a transmission element (25) rotatably mounted to the handle hub in the direction of said hub and therefore draws said sliding bolt (24) back so to allow door opening. This can be better seen in Fig. 4: Said transmission element (25) pivotally coupled to said hub at a bearing 26 is advanced by the lock cylinder (not shown) so as to rotate said hub, the latter letting said sliding bolt (24) temporarily in as a root spring (27) will reset its position.

[0014] The present invention in a nutshell proposes a lock mechanism (11) for locking a door. Said mechanism (11) comprises at least one locking latch (12) for effecting locking with a door frame panel slot, a driving mechanism for advancing said latches (12) in the locking and unlocking directions, a lock cylinder for controlling said driving mechanism, a sliding bolt (24) controlled by a hub and by said lock cylinder through a transmission element (25). Said at least one locking latch (12) is equipped with head portion (13) in the form of protrusions around the outermost plane of said latches (12) and extending beyond said outermost plane so as to form a peripheral part around said outermost plane.

[0015] While this invention has been described in conjunction with the exemplary embodiments such as in Fig. 5 with thicker head portions and in Fig. 6 with larger non-linear channels, various alternatives, modifications, variations, improvements, and/or substantial equivalents, whether known or that are or may be presently unforeseen, may become apparent to those having at least ordinary skill in the art. For example in Fig. 6, the middle latch (12) was removed along with certain other parts and only the pin (15) is shown for demonstrative purposes. Head portions (13) of the latches (12) may be rounded or cornered elliptical parts. They can also be in other geometrical shapes as long as such shapes also achieve the technical effect as in Claim 1.

[0016] Accordingly, the exemplary embodiments of the invention, as set forth above, are intended to be illustrative, not limiting. Various changes may be made without departing from the spirit and scope of the invention. Therefore, the invention is intended to embrace all known or later-developed alternatives, modifications, variations, improvements, and/or substantial equivalents.

Claims

1. A lock mechanism (11) for locking a door, said mechanism (11) having at least one locking latch (12) for

effecting locking with a door frame panel slot, a driving mechanism for advancing said latches (12) in the locking and unlocking directions, a lock cylinder for controlling said driving mechanism, a sliding bolt (24) controlled by a hub and by said lock cylinder through a transmission element (25), **characterized in that;** said at least one locking latch (12) is equipped with a head portion (13) in the form of protrusions around the outermost plane of said latches (12) and extending beyond said outermost plane so as to form a peripheral part around said outermost plane.

2. A lock mechanism (11) as in Claim 1 wherein said locking latch (12) is equipped with a tubular core element (16), onto which a pin (15) is secured with its free end being guided in a non-linear channel (14).
3. A lock mechanism (11) as in Claim 1 or 2 wherein said non-linear channel (14) is in the form of two linear sections (18, 19) divided by a turn.
4. A lock mechanism (11) as in any of the preceding Claims wherein said head portion (13) is substantially elliptical.

25

30

35

40

45

50

55

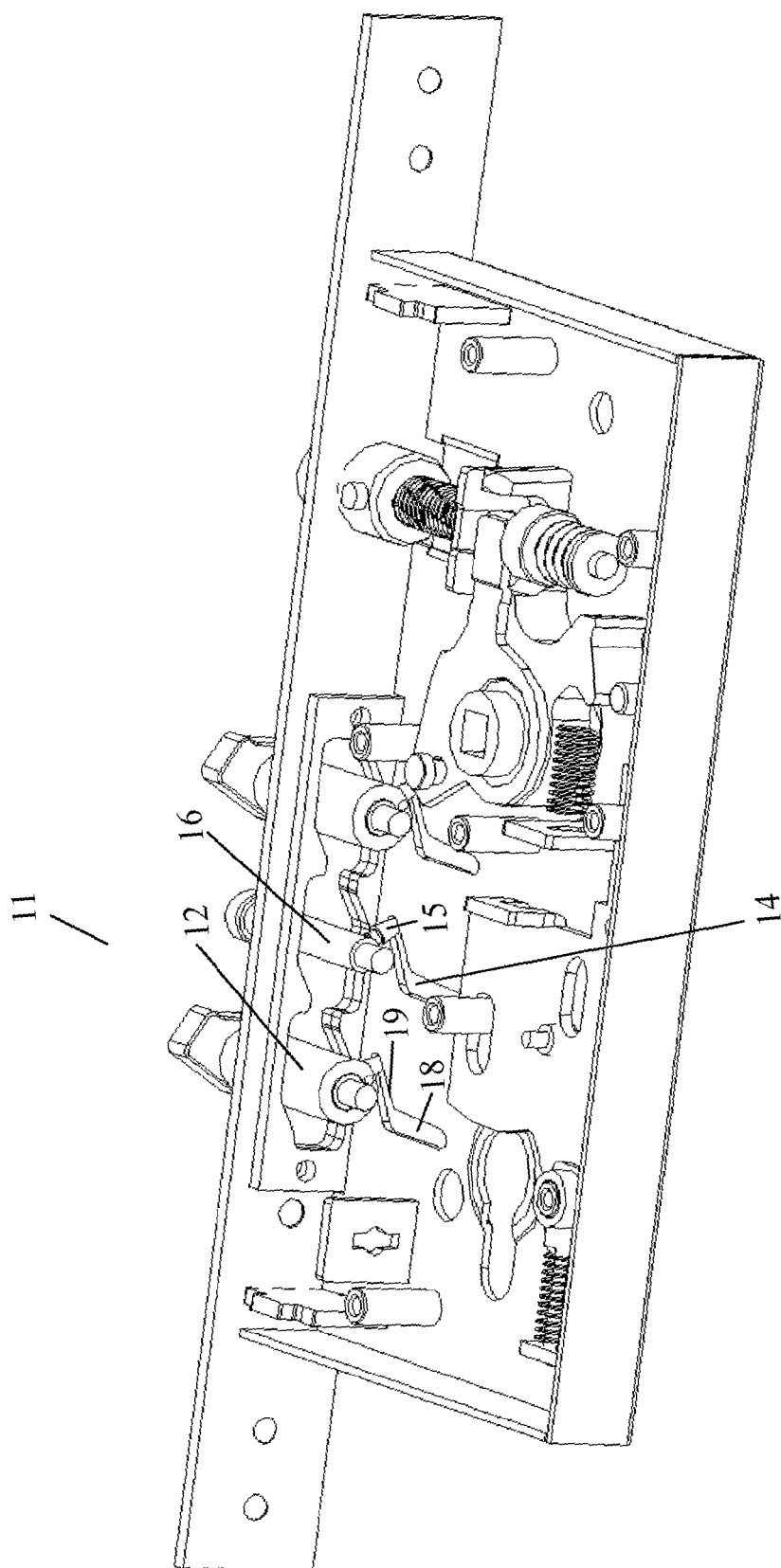


Fig. 1

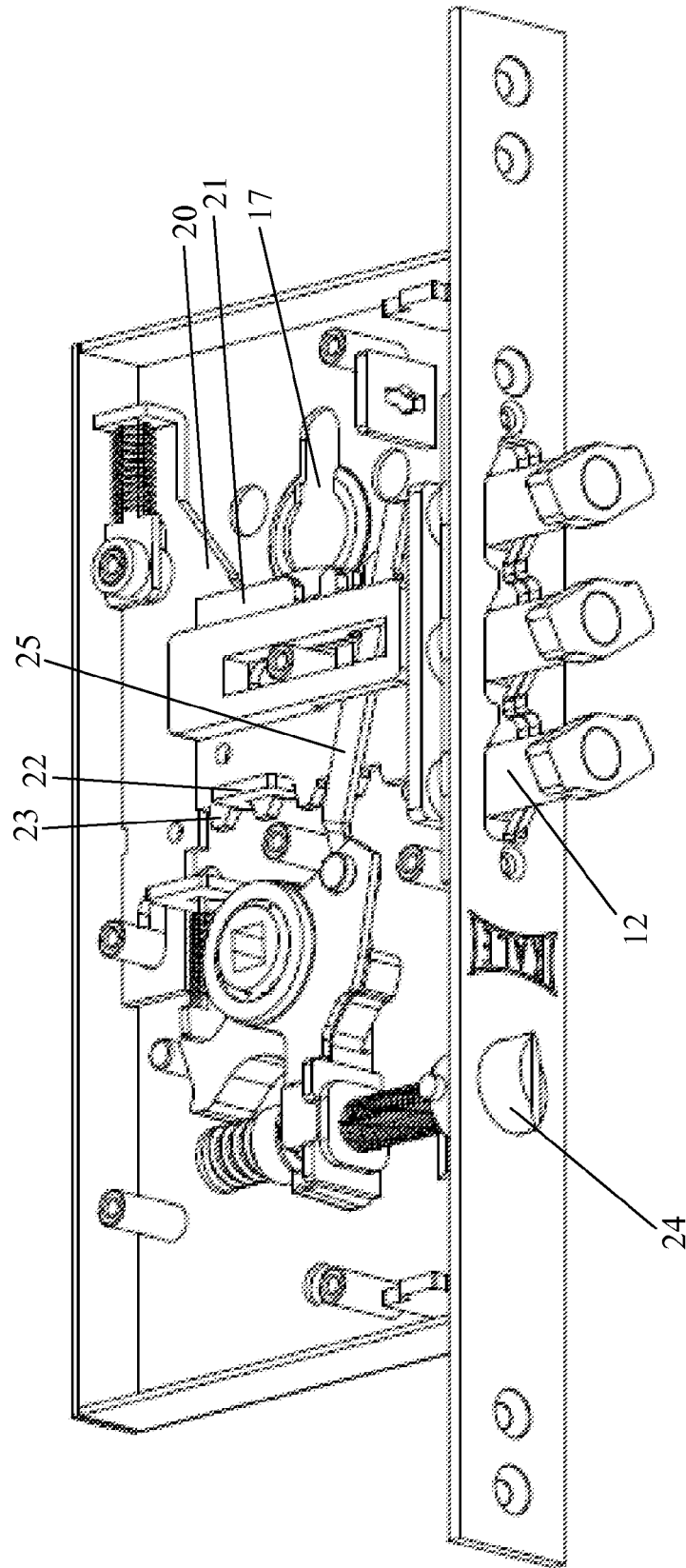


Fig. 2

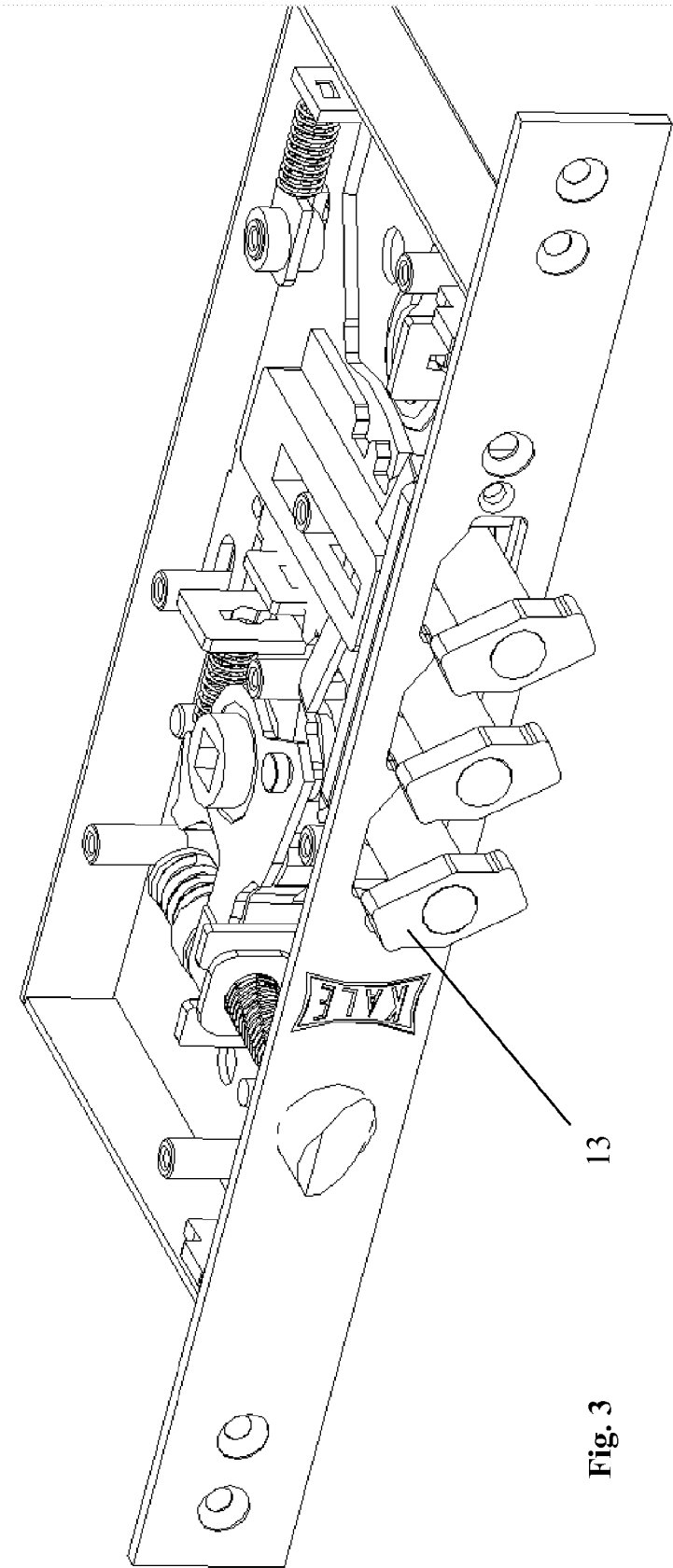


Fig. 3

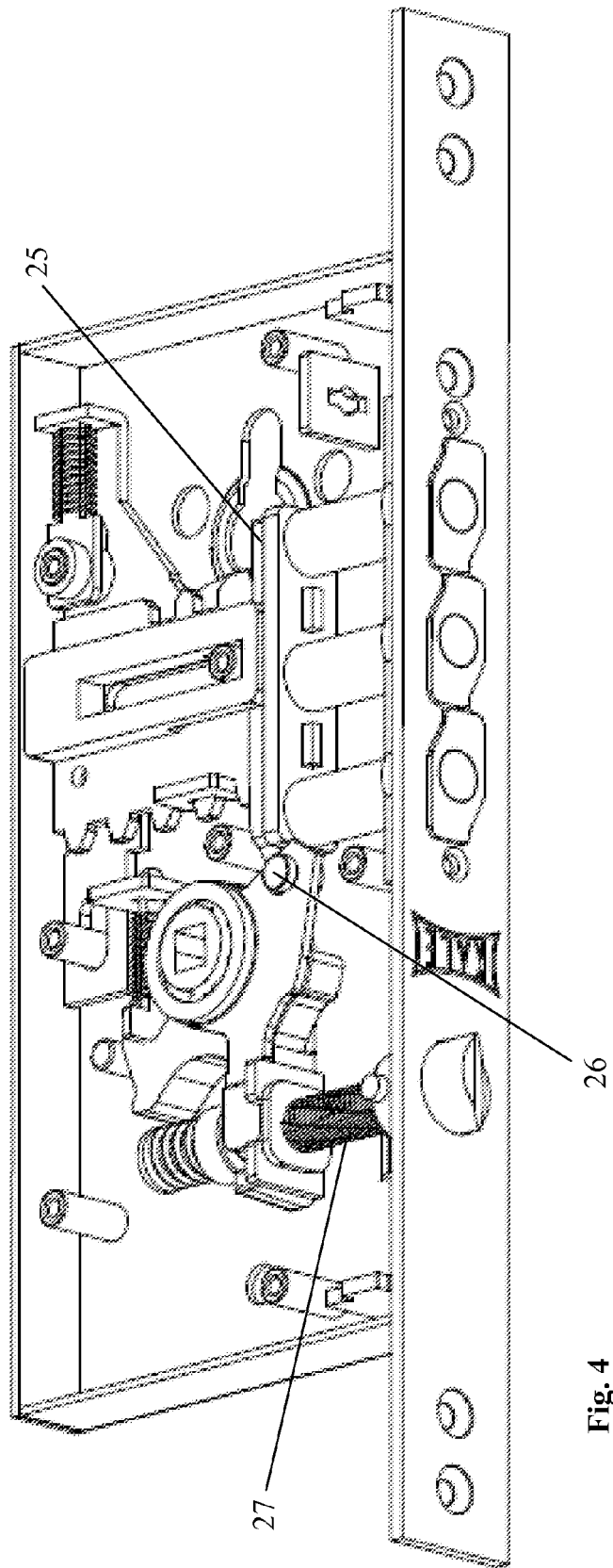


Fig. 4

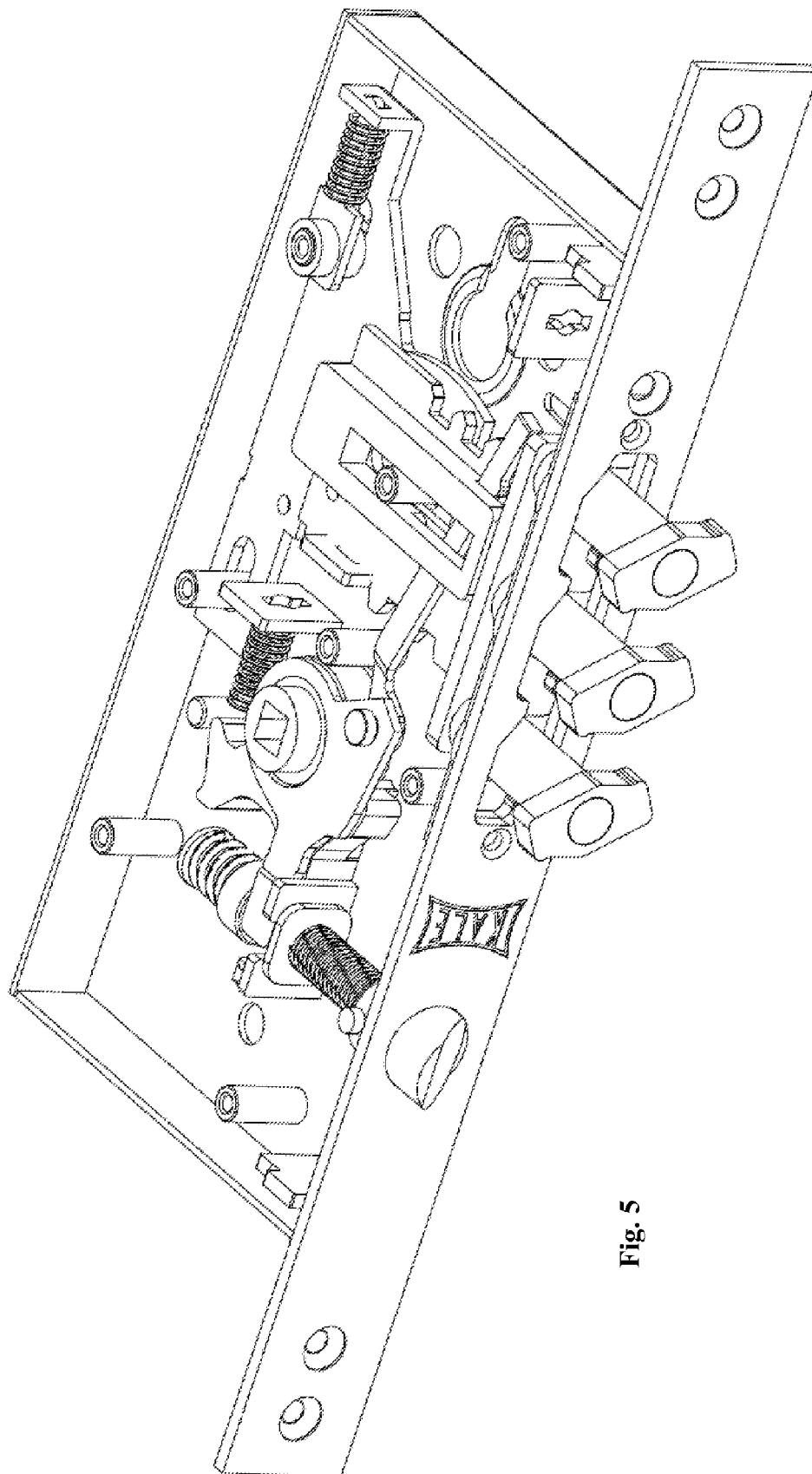


Fig. 5

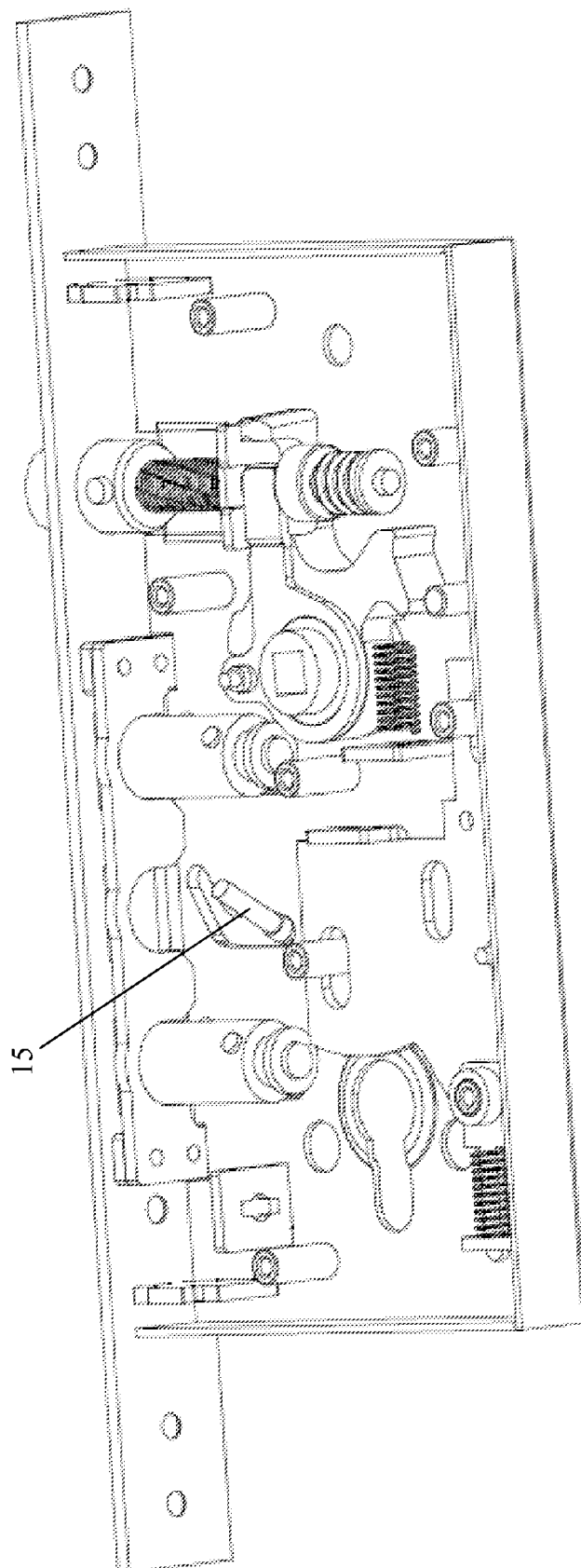


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 08 16 2511

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
D,X	WO 2006/120210 A (KALE KILIT VE KALIP SANAYI A S [TR]; ORCAN METIN [TR]) 16 November 2006 (2006-11-16) * page 3, line 20 - page 6, line 3; figures *	1	INV. E05B63/12
X	WO 03/046318 A (MUL T LOCK SECURITY PRODUCTS L [IL]; ARTZIELY AYAL [IL]) 5 June 2003 (2003-06-05) * page 5, line 27 - page 6, line 5; figure 3 *	1	ADD. E05B15/10 E05B59/00
X	DE 40 06 724 A1 (FLIETHER KARL GMBH & CO [DE]) 5 September 1991 (1991-09-05) * column 3, line 1 - column 4, line 68; figures *	1,2,4	
X	DE 19 451 C (BRACKER J.M.) 24 December 1881 (1881-12-24) * the whole document *	1	
A		4	
X	FR 594 438 A (FRANCIS KEIL ET SON) 12 September 1925 (1925-09-12) * the whole document *	1,4	TECHNICAL FIELDS SEARCHED (IPC)
A	EP 0 606 938 A (DIERRE SPA [IT]) 20 July 1994 (1994-07-20) * the whole document *	1,3,4	E05B
A	US 897 924 A (PROUTY T.C.) 8 September 1908 (1908-09-08) * the whole document *	1-3	
A	DE 619 374 C (PAUL NITZ) 2 October 1935 (1935-10-02) * the whole document *	1,3	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 5 March 2009	Examiner Henkes, Roeland
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			

 3
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 16 2511

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-03-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006120210 A	16-11-2006	AT 420261 T	15-01-2009
		CN 101010475 A	01-08-2007
		EP 1724420 A1	22-11-2006
WO 03046318 A	05-06-2003	AU 2002356405 A1	10-06-2003
		BR 0214399 A	03-11-2004
		CA 2464950 A1	05-06-2003
		CN 1617970 A	18-05-2005
		EP 1451425 A1	01-09-2004
		US 2004261475 A1	30-12-2004
DE 4006724 A1	05-09-1991	NONE	
DE 19451 C		NONE	
FR 594438 A	12-09-1925	NONE	
EP 0606938 A	20-07-1994	IT 1261035 B	08-05-1996
US 897924 A		NONE	
DE 619374 C	02-10-1935	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2006120210 A [0002]