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(54) **Automatic security lock with hook-shape latch reinforcement pins**

(57) The present invention proposes a trigger mechanism high security lock comprising a two-direction sliding bolt (12), a trigger latch (15) and a set of separate hook-shaped latches (13,14) in the form of curvilinear projections operating jointly in the manner to interlock with suitable latch slots on the door frame. Automatic locking is arranged by a triggering element allowing an extension part thereof to disengage from a slot on a carrier plate, this latter being operated by the door handle to oversee unlocking of the hook-shaped latches. According to the present invention, said curvilinear latches are provided with a plurality of pins (30) vertically projecting from the lateral surface thereof in the manner to face either of the case side sheets. In case of an unauthorized attempt to release the lock by bending the lock panel on the door frame outwardly so as to cause the latches to move in the direction of the frame, the vertically projecting pins within the inside of the case will abut against the lock panel on the lock side and prevent further movement of said latches.

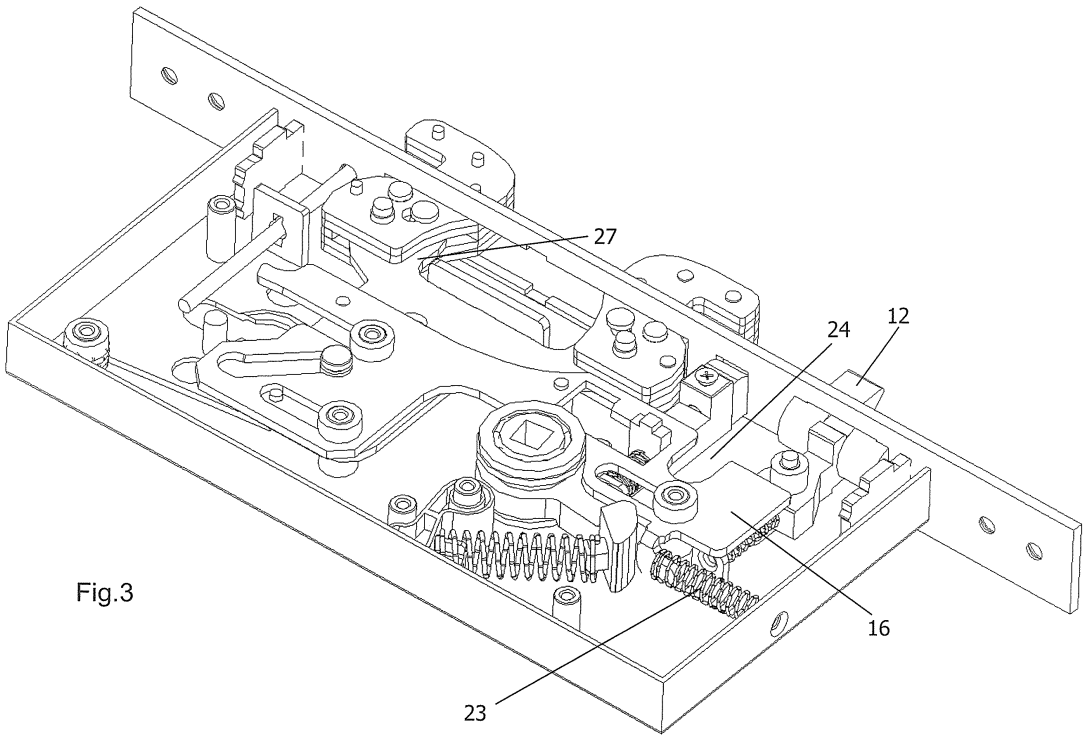

Fig.3

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Description

Technical Field of the Invention

[0001] The present invention relates to a lock, more precisely to an automatic door lock with hook-shaped latches showing improved security characteristics.

Background of the Invention

[0002] Automatic locks are known for their reliability against user carelessness. An automatic lock is by definition automatically locked irrespective of whether a user rotates the lock cylinder. This is the essential prominent advantage over a regular lock. Automatic locks normally require a trigger mechanism in order for actuating locking mechanism. It involves use of a trigger bolt to contact an opposite surface to be moved back in order for driving a set of mechanical elements connected such that latches engage in lock panel slots. To this end, such an automatic lock operates by a trigger latch activating or releasing a mechanical component connected to an actuator mechanism for switching a plurality of latches between a locking and unlocking positions

[0003] Besides, locks offering high security characteristics, that is to say, locks with hook-shaped dual latches engaging in suitable slots within the door frame are well-known in the circles of security lock manufacturers. Those are especially advantageous in that when fully locked, they simply provide multiple axes locking so as to withstand both vertical and horizontal forces produced in association with burglary attempts.

[0004] Multiple patent literature references may be provided herein, all with hook-shaped latches rotated by a set of actuator mechanism driven axles. Among others, one of the patents/patent applications available to the public is the Italian patent ITTO20000226, which is issued in the name of Tesio S.r.l. The same discloses hook-shaped latches in the form of curvilinear projections interlocking with latch slots laid on the lock panel. Said curvilinear latches are rotated by way of axles connected thereto. Rotation of the axles by an actuation mechanism is realized by a movable element commanding an arm incorporating suitable pivots rotating said axles and therefore said curvilinear latches.

[0005] The disclosure in regard to the hook-shaped latches herein differs from the available prior art in that it features a special arrangement designed to prevent burglary attempts specifically aiming at rendering hook-shaped latches nonfunctional by damaging their rotation mechanisms. Although locks with this type of latches are substantially advantageous over a regular linear latch lock, they still incorporate certain vulnerabilities.

[0006] 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 hook-shaped latches reach their limit strength and therefore either their hook ends break through a line defining the outer part hook head or the pivoting pins on which said curvilinear latches are rotatably mounted - and therewith also fixed to the side sheet of the lock case- and the latch actuation pins guided on the latches tend to advance in the frame direction by tearing said lock case side sheet throughout the distance up to the panel on the lock side. In the latter case, it is probable that said pivot axles and guided actuation pins get broken off.

[0007] In both cases, on the other hand, all security aspects of the door will practically become nonfunctional since respectively either the latches will no more be engaging in the slots on the frame side lock panel in the absence of the hooking portions or they will no more be secured neither by pivot axles nor by guided actuation pins.

[0008] The lock case side walls and several individual components of lock hardware are typically secured to each other within the case in several points. The pins on the rotation axes of the hook latches are also secured to the sheet material side wall. This becomes a serious drawback especially in the event of a burglary attempt as exemplified earlier. The linear tension produced by the perpetual screw along the transversal axis of the door in the direction of the door frame especially requires the hook latches to resist against the outward force induced on the hook ends.

[0009] When burglary takes place, the hook ends are in a position interlocked with the slots on the frame side lock panel. This latter is made of a strong material and will not break off in most cases. As the perpetual screw rotates, however, it will tend to bend outward and the slots on the panel along with the hook ends interlocked therewith will be deformed to the extent that a gap will occur in between the lock side and the frame side panels.

[0010] Break of the hook-shaped latches can be prevented and remedied by way of appropriate material selection. On the other hand, with the assumption that the outer hook portions of the hook latches can resist against breaking off due to appropriate material selection, the break away force will then exert on the axles and on the guided hook latch actuation pins. Upon breaking off of the pivoting pins, whose primary function is not retaining the integrity of the system and resisting against outside forces but to constitute the rotation center thereof, the hook latches will first lose contact with the case side sheet and by a certain damage on the guided actuation pins, the latches will practically be free and not anymore secured to the lock case.

[0011] As will be apparent in the proceeding parts, the present invention solves the specific problem of automatic locks by making use of the lock panel, which is already

made of a strong material and which is suitable for resisting against forces that are to cause movement of the latches outside their predetermined outermost limit positions.

[0012] Along with the above information in relation to the security features of the hook-shaped latches according to the present invention, the same brings about an improved security lock capable of automatic operation. This is provided by a set of elements allowing full-locking of the lock mechanism upon insertion of a triggering latch so as to activate respective elements in order for advancing the hook-shaped latches into locked position.

[0013] Automatic locking is arranged by a triggering element allowing an extension part thereof to disengage from a slot on a longitudinal carrier plate, this latter being operated by the door handle to oversee unlocking of the hook-shaped latches. Automatic locking is triggered when said trigger element makes contact with the door frame lock panel.

[0014] The present invention provides a high security automatic lock which can conventionally be opened from outside by way of rotating a key thereof in the lock cylinder or from inside by way of turning the handle. Automatic locks are known in the field for their feature of eliminating risks arising from user carelessness to leave the door unlocked. The present invention therefore provides an automatic lock with high security curvilinear latches.

Objects of the Invention

[0015] Primary object of the present invention is to provide a trigger mechanism high security door lock with hook-shaped latches, the outward movement of which is kept within a predetermined range and can not be removed from the lock case.

[0016] Another object of the present invention is to provide a door lock with hook-shaped latches, whose latches lock into the their corresponding positions automatically when the door is closed and whose latches have reinforcement pins that transfer the load incurred during an attempt to separate the latch from the casing of the lock onto the door-side lock panel as well as onto the frame-side lock panel, whereby the tear force on the rotational axle of the latches are reduced.

Summary of the Invention

[0017] The present invention proposes a trigger mechanism high security lock comprising a two-direction sliding bolt, a trigger latch and a set of separate hook-shaped latches in the form of curvilinear projections operating jointly in the manner to interlock with suitable latch slots on the door frame. Automatic locking is arranged by a triggering element allowing an extension part thereof to disengage from a slot on a carrier plate, this latter being operated by the door handle to oversee unlocking of the hook-shaped latches. According to the present invention, said curvilinear latches are provided with a plurality of pins vertically projecting from the lateral surface thereof in the manner to face either of the case side sheets. In case of an unauthorized attempt to release the lock by bending the lock panel on the door frame outwardly so as to cause the latches to move in the direction of the frame, the vertically projecting pins within the inside of the case will abut against the lock panel on the lock side and prevent further movement of said latches.

Brief Description of the Figures

[0018] Accompanying drawings are given solely for the purpose of exemplifying a locking assembly whose advantages over prior art were outlined above and will be explained in detail hereinafter: The scope of the present invention, which is explained with reference to the drawings below, can not be limited to the disclosure of the drawings that are given solely for the purpose of exemplifying.

[0019] Fig. 1 demonstrates a perspective upper view of the lock assembly according to the present invention.

[0020] Fig. 2 demonstrates a perspective side view of the lock assembly according to the present invention.

[0021] Fig. 3 demonstrates another perspective side view of the lock assembly according to the present invention.

Detailed Description of the Invention

[0022] Referring now to the figures outlined above, the lock assembly in Fig. 1, generally referred to as 11, comprises a plurality of latches (12, 13 and 14) movable relative to said assembly (11) in the manner to engage in suitable slots on the lock panel and last but not least a trigger latch (15) that activates or releases a carrier plate (16) in contact with an actuator mechanism for switching said plurality of latches (13, 14) between a locking and an unlocking positions.

[0023] The two-way lock bolt (12) according to the present invention is formed in the manner to be mounted irrespective of the actual closing direction of the door, that is to say, the need to arrange the inclined surface of the bolt considering the closing direction of the door is eliminated. The two-direction symmetrical bolt consists of two half-parts mounted in opposite directions. Hence, neither the closing direction of the door nor the door side on which the lock is to be mounted will not be relevant since both half-parts are suitable for allowing sufficient clearance for door closure in any direction. Both half-parts are rotatably mounted in opposite directions on axles on their bottom portions.

[0024] The two-direction bolt (12) extends into the lock case in the form of a rod with a carrier plate blockage pin (17) thereon. The carrier plate (16), whose details will be disclosed below, is the most essential element of the automatic operation. Said carrier plate blockage pin (17), when full-locking is reached, presses on the lateral surface of said carrier plate (16) and is therefore disallowed

from moving back. This ensures protection against one of the most popular types of burglary attempts made in the manner to insert a solid, thin object such as a bank card, in between the door and the door frame along the bolt in order for moving the same back in a door closed without locking.

[0025] The carrier plate (16) according to the present invention extends longitudinally along the lock mechanism. It incorporates means for activating said curvilinear latches (13, 14) and is basically controlled by the handle hub from inside and by the lock cylinder from outside to release the lock. An extension (18) of the handle slot integrated thereto moves said plate (16) by means of a carrier plate control pin (19).

[0026] The automatic operation is triggered by way of said trigger latch (15) being advanced back so as to release an upright extension (20) thereof. Said upright extension (20) normally rests in a carrier plate blockage recess (21) on said carrier plate (16). When the trigger latch (15) makes contact with the door frame lock panel during closure, it is moved back since there exist no corresponding slot on the opposite frame panel and therefore releases said upright extension (20) from said carrier plate blockage recess (21), causing advance of the spring loaded carrier plate to drive said curvilinear latches (13, 14).

[0027] The carrier plate (16) always tends to set the lock mechanism to the locking position. This is achieved through a plurality of spring loaded structures. One of these, referred to as 23, is secured to the lock case lateral surface so as to be compressed by the carrier plate (16) by means of an extension part thereof. The carrier plate spring (23) is compressed when the mechanism is unlocked and stretched when it is locked. When the handle hub extension (18) drives said carrier plate (16) into the unlocked position longitudinally in the direction of the two-direction bolt (12), said carrier plate blockage pin (17) engages in a recess (24) on said carrier plate (16) and restricts its movement in any direction, therefore keeping said carrier plate spring (23) in its compressed position.

[0028] The carrier plate blockage pin (17) and the trigger latch upright extension (20), respectively engaging in the recess 24 and in the recess 21 ensure that the carrier plate (16) is temporarily fixed until the trigger latch (15) makes contact with the opposite lock panel to release said carrier plate blockage pin (17) and said trigger latch upright extension (20) to let the plate (16) move in the direction of said curvilinear latches (13, 14) by the pre-loaded spring forces to drive said latches (13, 14).

[0029] Another spring mechanism, referred to as 25 according to the present invention, is secured to the longitudinal lateral surface of the lock case so as to continuously press on an extension of the handle hub so as to rotate the same in the reverse direction to the unlocking direction thereof. The force exerted by the spring mechanism 25 along with that of the spring 23 provides automatic locking of the carrier (16) upon initiation of triggering.

[0030] According to the present invention, a set of separate hook-shaped latches (13, 14) in the form of curvilinear projections operating reciprocally in an integral manner are employed so as to interlock with a suitable latch slot laid on the frame side lock panel. Said curvilinear latches (13, 14) are designed to be operated jointly and to be rotating by way of axles (22) connected thereto. The hook-shaped latches (13, 14) are conventionally designed to have a curvilinear side on the outer portion of the head part, the latter extending inward in the form of a right-angled corner and forming therein a space between two blocks. One of those blocks is actually the head portion, which engages into the slot on the lock panel.

[0031] As for the curvilinear latches (13, 14), rotation of the axles (22) so as to effect locking of the latches (13, 14) is realized by an actuation mechanism started by insertion of a key into the keyhole in the manner to advance a rotatable element (not shown) of the lock cylinder, the latter driving said carrier plate (16) to provide locking. The function of a lock cylinder is apparent to the person in the art. Apart from conventional lock cylinders, the cylinder hereof is in the form of a half-cylinder accessible only from inside the house.

[0032] The actuator means for the latches (13, 14) is typically comprised of a linearly guided unidirectionally sliding plate (26) with two gripping arms (27) extending to the latches' (13, 14) rotation center (22).

[0033] The linearly guided unidirectionally sliding plate (26) is connected to the carrier plate (16) by means of a plurality of pins (31, 32 and 33) that move back and forth through channels located on said carrier plate (16) in order for driving said linearly guided unidirectionally sliding plate (26). Those channels (34, 35 and 36) are arranged such that two longitudinally extending channels (34, 36) accommodates pins 33 and 32 and the other channel (35), which is inclined with respect to both the longitudinal axis of said carrier plate (16) and with respect to the longitudinal axis of said linearly guided unidirectionally sliding plate (26), accommodates pin 31. Said pins 32 and 33 are additionally guided within two channels (only channel 37 shown, channel 38 not shown but referred to for clarity) extending perpendicular to said open-end channel 36 and channel 34 on said linearly guided unidirectionally sliding plate (26).

[0034] Said channel 35 incorporates at its far end a curved end part (39) to accommodate said pin 31 in order for temporarily holding it when the spring loaded structures (23, 25) are compressed in locked position.

[0035] According to the present invention, the curvilinear lock bolts (13, 14) are designed to provide a single-turn 90-degree displacement ensuring engagement position into the panel slot in one turn. Turning of an appropriate key in the keyhole causes the axles (22) and a couple of redirection pins (28) that are guided within the latches (13, 14), to rotate said latches (13, 14) accordingly. Each of said pins (28) is driven back and forth between two edges of a guiding channel (29), depending

on the positions during engaging and disengaging. Synchronous movement of said redirection pin (28) together with said axle (22) leads to a full step 90-degree slip of the curvilinear latches (13, 14) in a reciprocal manner. Each gripping arm (27) extending to each latch (13, 14) comprises an open end recess in order for laterally receiving said axles (22) whose bottom surfaces are secured to a suitable slot on at least one of the lock case sidewalls. When fully locked, the axles (22) are fully encircled with the exception of the recess's open end to limit the movement of the same.

[0036] Beside said recesses on each arm, a slot for vertically accommodating said redirection pin (28), which is only allowed a limited linear movement within said guiding channel (29), is located. Movement of this latter to move the latch (13, 14) is directly effected by said gripping arm (27) since it is placed into both the gripping arm (27) slot and the latch channel (29) coaxially. In the very beginning of the locking sequence, each gripping arm (27) reciprocally advances to slip said redirection pins (28) to the channel (29) limits and further advancing of the gripping arms (27) causes the redirection pins (28) to carry said latches (13.14) around each rotation center (22) to the full-locked position. Single turn 90-degree movement of the latches (13, 14) is not possible without the advance of the redirection pins (28) to the outermost limit position in the guiding channels (29). In other words, rotation is effected by the redirection pins' (28) movement within the channels (29) inclined with regard to the lock panel direction. The fact that the location of the rotation center (22) is on the direction of the inclined channels (29), provides an effective single-turn 90-degree slip. An effective single step full rotation would not be possible in an alternative design in which the rotation centers (22) are not directly located on the channels' (29) longitudinal direction.

[0037] In an automatic lock, to avoid a burglary attempt of the type defined earlier, in which an endless screw is used to bend the lock panel in the direction of the door frame in the manner to load stress on the most critical security components such as the redirection pins (28) and the axles (22), the present invention features a set of special arrangements to keep the redirection pins (28) and the axles (22) away from the induced force components. Accordingly, said curvilinear latches (13, 14) are additionally provided with a plurality of pins (30) vertically projecting from the lateral surfaces of their body portions that remain within the lock case in locked position. In case of an unauthorized attempt to release the lock by bending the lock panel on the door frame outwardly so as to cause the latches (13, 14) to move in the direction of the frame, the vertically projecting pins within the inside of the case will abut against the lock panel and stop displacement of said latches (13, 14).

[0038] The reinforcement pins (30) are the first barriers to contact the lock panel in any attempt to slip said latches (13, 14) outwardly, that is, in the direction of the door frame. Since they are longitudinally embedded in the latch (13, 14) body in a secure manner with the head portions slightly running over the latch (13, 14) surfaces in a manner to form a sufficient contact surface with the lock panel portion outside the latching slot, letting the latter stop the entire latch (13, 14) body moving and resisting against outward forces otherwise exerted on the redirection pins (28) and the axles (22).

[0039] The reinforcement pins (30) are located substantially close to the lock panel considering the locked position layout of the latches (13, 14). In other words, the distance of the reinforcement pins (30) to the lock panel is smaller than the radius of the reinforcement pin (30) itself. More precisely, the smallest distance between a point of the reinforcement pins (30) and the lock panel is smaller than the radius of the reinforcement pin (30) itself.

[0040] According to the present invention, reinforcement pins may also be installed on the far end of the latch (13, 14) to the lock panel. Such pins projecting symmetrically from both surfaces of a curvilinear latch (13, 14) will further delay removal of latch (13, 14). In the country of the applicant, it is known that the risk for a burglar to fully release a high security lock sharply decreases as the duration consumed by a burglar in front of a single lock increases.

[0041] In a nutshell, the present invention proposes a locking assembly (11) comprising a plurality of regular and curvilinear latches (12, 13 and 14) movable relative to said assembly (11) in a manner to engage in suitable slots on a lock panel, a trigger latch (15) that activates or releases a carrier plate (16), a handle hub in control of said carrier plate (16) from the inside, a half-cylinder mechanism in control of said carrier plate (16) from the outside, actuator mechanisms for actuating said regular and curvilinear latches (12, 13 and 14) and transmission mechanisms transferring motion to said plurality of latches (12, 13, and14), said curvilinear latches (13, 14) being provided with at least one reinforcement pin (30) projecting from the lateral surfaces of the curvilinear latch (13, 14) body portions remaining within the lock case in locked position.

Claims

1. A locking assembly (11) comprising a plurality of curvilinear latches (13, 14) movable relative to said assembly (11) in a manner to engage in corresponding slots on a lock panel, a trigger latch (15) that activates or releases a carrier plate (16), a handle hub in control of said carrier plate (16) from the inside, a half-cylinder mechanism in control of said carrier plate (16) from the outside, actuator mechanisms for actuating said regular and curvilinear latches (13, 14) and transmission mechanisms transferring motion to said plurality of latches (13, 14) **characterized in that**;
   said curvilinear latches (13, 14) are provided with at least one reinforcement pin (30) projecting from the

lateral surfaces of the curvilinear latch (13, 14) and leaning onto the interior of the door-side panel when the door is closed.

2. A locking assembly (11) according to Claim 1 wherein said reinforcement pins (30) are longitudinally embedded in the curvilinear latch (13, 14) body with the head portions running over the latch (13, 14) surfaces in a manner to form a lateral contact surface with the lock panel portion outside the latching slot.

3. A locking assembly (11) according to Claim 2 wherein said reinforcement pins (30) are located substantially close to the lock panel with regard to the locked position layout of the latches (13, 14).

4. A locking assembly (11) according to Claim 1 wherein the assembly further comprises a latch (12) having two half-parts rotatably mounted in opposite directions on axles on their bottom portions.

5. A locking assembly (11) according to Claim 4 wherein said latch (12) extends into the lock case in the form of a rod with a carrier plate blockage pin (17) thereon, pressing on the lateral surface of said carrier plate (16) to be disallowed from moving back in locked position and engaging in a recess (24) in unlocked position.

6. A locking assembly (11) according to Claim 1 wherein said handle hub comprises an extension (18) integrated thereto to move said plate (16) by means of a carrier plate control pin (19)

7. A locking assembly (11) according to Claim 1 wherein said trigger latch (15) comprises an upright extension (20) resting in a carrier plate blockage recess (21) in unlocked position and releasing from said recess (21) when the trigger latch (15) makes contact with the door frame lock panel during closure.

8. A locking assembly (11) according to Claim 1 wherein said lock assembly (11) comprises a spring loaded structure (23) secured to the lock case lateral surface so as to be compressed by said carrier plate (16).

9. A locking assembly (11) according to Claim 8 wherein said lock assembly comprises another spring loaded structure (25) secured to the longitudinal lateral surface of the lock case so as to continually press on the handle hub in order for rotating the same in the reverse direction to the unlocking direction of said handle hub.

10. A locking assembly (11) according to Claim 1 wherein said transmission mechanism transferring motion to said plurality of curvilinear latches (13, 14) comprises a linearly guided unidirectionally sliding plate (26) connected to the carrier plate (16) by means of a first and a second pin (respectively 33 and 32) moving back and forth through perpendicularly arranged channels (36, 37 and 34, 38) respectively located on said carrier plate (16) and on said linearly guided unidirectionally sliding plate (26).

11. A locking assembly (11) according to Claim 10 wherein said carrier plate (16) comprises a pin 31 guided within a channel (35) inclined with respect to both the longitudinal axis of said carrier plate (16) and with respect to the longitudinal axis of said linearly guided unidirectionally sliding plate (26).

12. A locking assembly (11) according to Claim 11 wherein said channel 35 incorporates at its far end a curved end part (39) to accommodate said pin 31 in order for temporarily holding it when the spring loaded structures (23 ,25) are compressed in locked position.

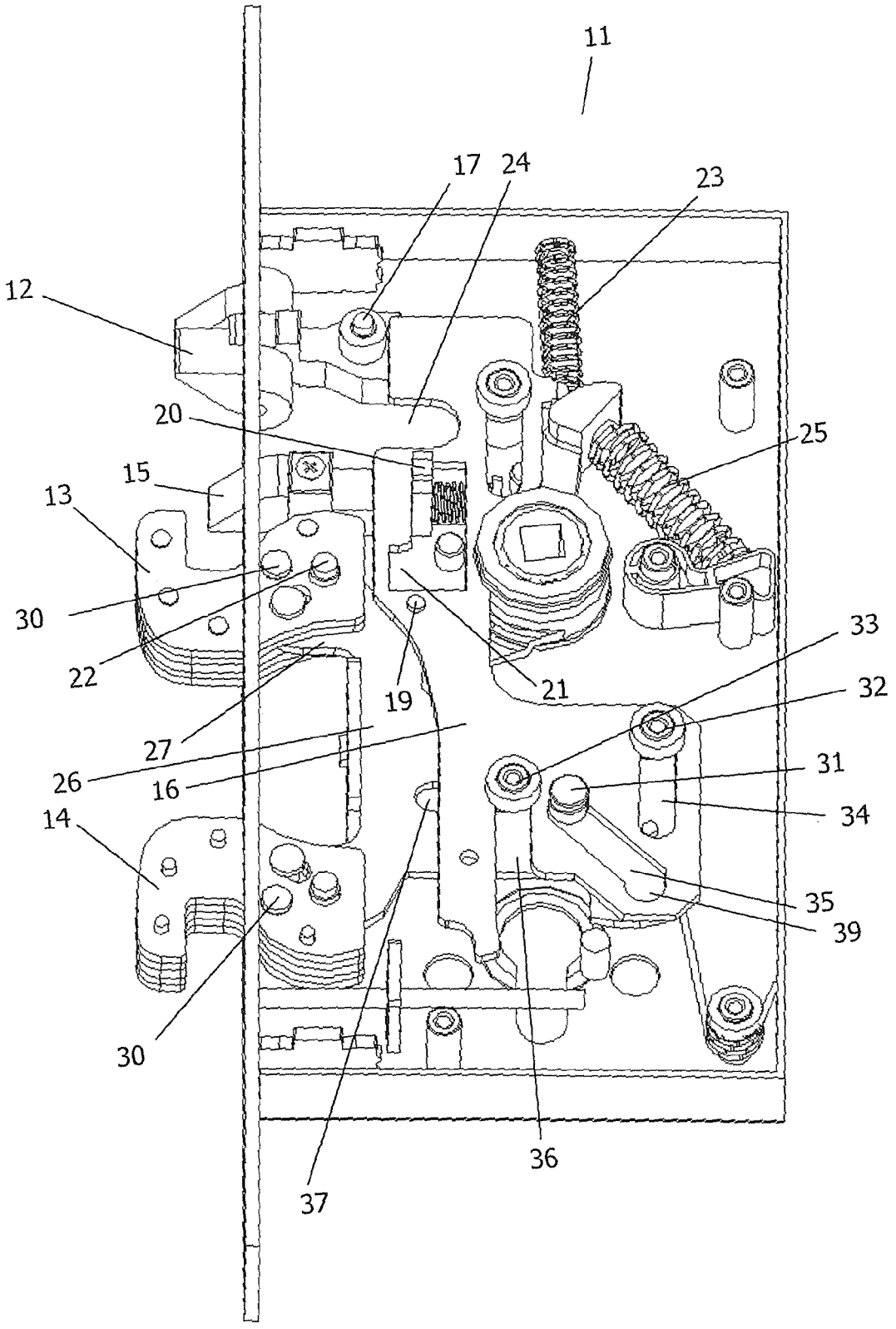
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Fig.1

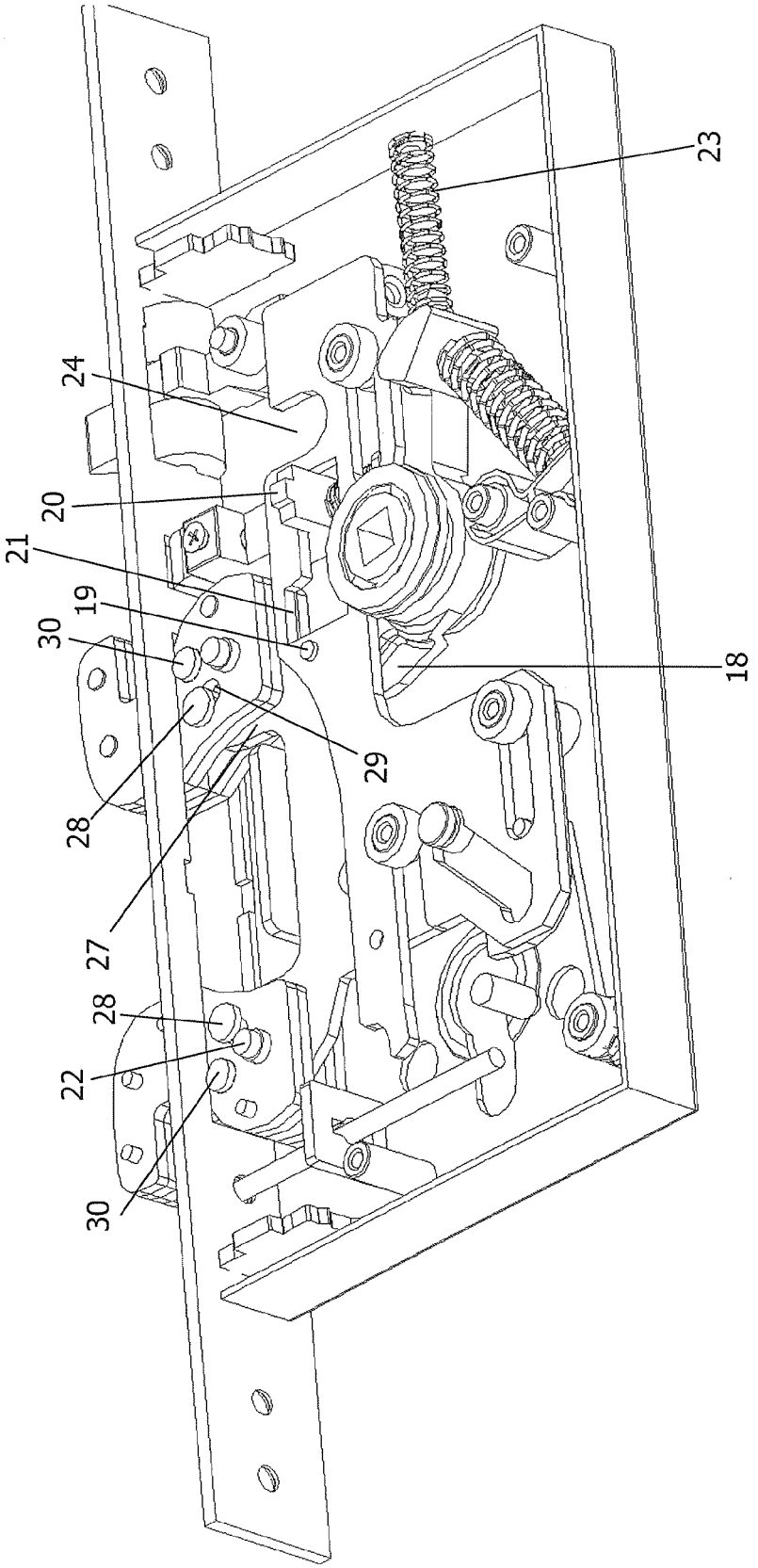

Fig. 2

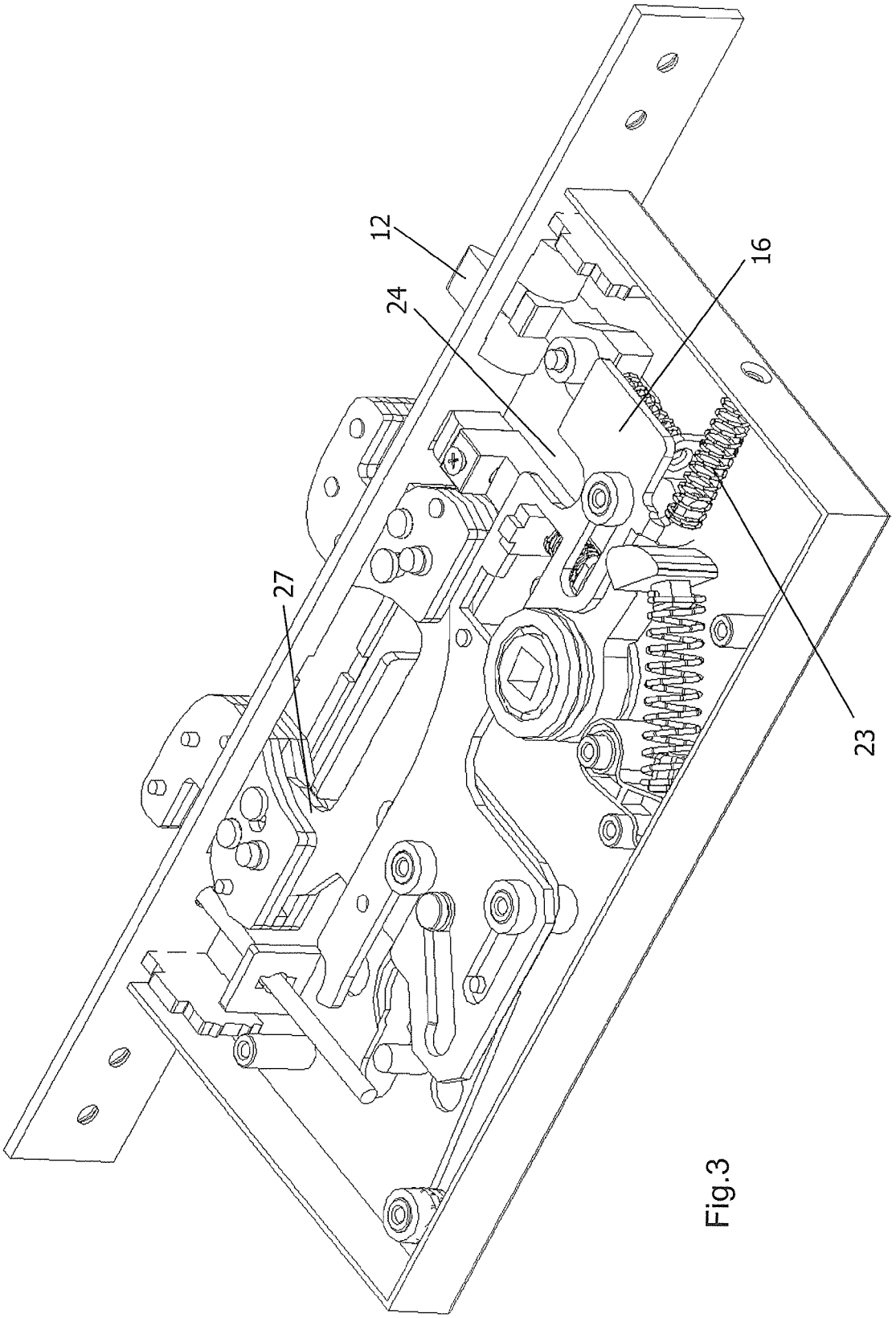

Fig.3

European Patent Office

PARTIAL EUROPEAN SEARCH REPORT

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 06 11 4769

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 2002/017120 A1 (WATTS JOHN RUSSELL [AU] ET AL) 14 February 2002 (2002-02-14) * the whole document *	1,3-5, 10-12	INV. E05B63/20 E05B17/20
Y	GB 2 309 996 A (PADDOCK FABR LTD [GB]) 13 August 1997 (1997-08-13)	1,3, 10-12	ADD. E05B63/12
A	* page 2, line 3 - page 9, line 1; figures *	4	E05B3/06 E05C3/34 E05C9/18
Y	TR 2004 03655 U (KALE KILIT VE KALIP SANAYII A [TR]) 21 March 2005 (2005-03-21)	4,5	
A	* the whole document *	1,6-12	
A	US 3 695 068 A (EADS CHARLES L ET AL) 3 October 1972 (1972-10-03) * the whole document *	1,3,4,6, 9	
A	EP 1 088 955 A2 (ALBAN GIACOMO SPA [IT]) 4 April 2001 (2001-04-04) * the whole document *	1,3,4, 10-12	
A	DE 93 21 445 U1 (FLIETHER KARL GMBH & CO [DE]) 26 February 1998 (1998-02-26) * the whole document *	1,3,4, 10-12	

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TECHNICAL FIELDS SEARCHED (IPC)

E05B
E05C

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

6

Place of search	Date of completion of the search	Examiner
Munich	8 February 2007	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

EPO FORM 1503 03.82 (P04C07)

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PARTIAL EUROPEAN SEARCH REPORT

Application Number
EP 06 11 4769

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	EP 1 243 729 A2 (ROTO FRANK EISENWAREN [AT] ROTO FRANK AG [DE]) 25 September 2002 (2002-09-25) * the whole document *	1,3, 10-12	
A	US 2004/256860 A1 (TSAI MIAO HSUEH [TW]) 23 December 2004 (2004-12-23) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC)

EPO FORM 1503 03.82 (P04C10)

6

European Patent Office

INCOMPLETE SEARCH
SHEET C

Application Number
EP 06 11 4769

Claim(s) searched completely:
1,3-12

Claim(s) not searched:
2

Reason for the limitation of the search:

It is not clear in what sense the "pins are longitudinally embedded in the latch" as they project laterally from the side faces.

It is not clear how "the head portions (presumably of the pins) are running over the latch surfaces, as they are fixedly connected to the latch.

It is not clear what part of the lock panel is meant, with the expression "lock panel outside the latching slot".

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 11 4769

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