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(54) SECURITY DEVICE FOR A CYLINDER LOCK

SICHERHEITSVORRICHTUNG FÜR EINEN SCHLIESSZYLINDER

DISPOSITIF DE SÉCURITÉ POUR UNE SERRURE CYLINDRIQUE

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Description

TECHNICAL FIELD OF INVENTION

[0001] . The present invention is relative to an improved security device for a cylinder lock, in particular for doors or gates, having the purpose of safeguarding said cylinder lock from tampering, breaking-in or vandalizing attempts.

BACKGROUND OF INVENTION

[0002] . Cylinder locks that are suitable, for example, to allow the closing and opening of a door or a gate, that include a cylinder operated by means of a relative key inserted into a keyhole arranged axially with respect to the cylinder are widely known.

[0003] . The cylinder locks of known type are generally made of brass, a material that offers scarce mechanical resistance against forced-entry attempts performed by drilling and/or breaking-in and/or wrenching.

[0004] . In order to safeguard the cylinder from possible break-ins, a known solution is to fasten to the lock a covering element arranged so as to cover the cylinder and consisting of a plate of essentially circular shape provided, at the keyhole on the cylinder, with a round hole in which is rotatably connected a keyhole protection plate provided with a slit to allow the insertion of the key.

[0005] . Although they improve the protection of the cylinder, such protective key-plates do not however prevent the partial access to the cylinder through the slit on the keyhole cover plate; thus the cylinder is still susceptible to possible tampering or vandalising such as, for example, the insertion of glue or other substances into said slit with the intent of damaging the cylinder.

[0006] . Italian Patent IT 1342717 B describes a security device for the cylinder of a lock that comprises a strip of essentially rectangular shape having at one end a through opening into which is inserted the section of the cylinder that protrudes from the lock.

[0007] . On the front surface of the strip, facing the opposite side of the lock, are formed two seats within which are rotatably accommodated two substantially cylindrical cams containing magnets.

[0008] . On the lateral surface of each cam is radially formed an undercut adapted to be engaged with a respective locking pin slidingly contained within a through hole formed transversely to the strip and communicating with the seat of the respective cam. Each pin is thrust toward the outside of the respective through hole by a spring inserted into the hole.

[0009] . On the front surface of the strip, and therefore on the external side of the door so that it can be accessible to the user, is slidingly associated a covering element capable of selectively occluding the cylinder of the lock.

[0010] . Laterally with respect to the covering element are formed, one on each side, relative slots that can be engaged by the pins projecting from the strip when the

covering element completely covers the cylinder; in this manner, the sliding of the covering element with respect to the strip is blocked.

[0011] . The release of the covering element is achieved by placing on the same element a relative magnetic key containing magnets that can couple with the magnets contained in the cams to cause the rotation of the cams to the point where the circumferential undercuts are brought into a position of axial alignment with the pins.

[0012] . The lowering of the covering element causes the pins to come out of the lateral slots and to enter into the cam undercuts, so as to allow the downward sliding of the covering element and make the cylinder accessible for inserting the key to open the door.

[0013] . Even though the security device described above provides a greater protection in comparison with the conventional keyhole protection plates, it still presents some drawbacks.

[0014] . To begin with, the size of the device, and in particular its considerable vertical extension, in addition to making it aesthetically unattractive, may entail seizures or jamming during the sliding of the covering element.

[0015] . In addition, the positioning of the covering element outside the strip, and therefore in plain sight on the external face of the door on which the device is mounted, makes it easily vulnerable to any acts of tampering, break-in or vandalism, for example with hammer strokes to forcibly lower the covering element or through drilling to access the cylinder, even when the covering element is in the blocked position.

[0016] . Another shortcoming lies in the possible difficulty in the unlocking operation under normal conditions, in which the user is required to apply, with a certain force, a downward thrust on the cover element to disengage the pins from the lateral slots of the cover element itself.

[0017] . As a partial solution of the above problems, the solution suggested in European Patent Application EP 2913461 A1 has been proposed, on which is based the preamble of claim 1, consisting of a security device of a cylinder lock that includes a cylindrical casing associable to said lock and provided with an axial opening wherein to house a cylinder of said lock, said opening being eccentric with respect to the centre of the casing.

A combinatory unit comprises magnetic means, a slider interposed between the casing and a protective key-plate adapted to be coupled to the casing and provided with a second through opening arranged out of line with respect to the centre of said key-plate so as to be aligned, when in use, with the axial opening. The slider moves between a locking position, in which it occludes the axial opening to prevent access to the cylinder, and an unlocking position in which it allows access to the opening. The switch between the locking position and the unlocking position, and vice versa, is actuatable by a magnetic actuator provided with a combination designed to cooperate with the magnetic means of the combinatory unit.

[0018] . Although this prior art solution effectively re-

solves the above described problems, it is limited in the number of possible combinations that can be obtained with the combinatory unit.

[0019] . EP 2767656 A1 discloses a lock comprising a cylinder, fixed to a door or door wing, with which a pivot is associated coaxially and rotatably, a lever for closing the door or door wing to a jamb being keyed to the end of the pivot; a separate body can be keyed detachably to the head of the pivot and is provided with magnetic means for the temporary locking of the rotation of the body with respect to the cylinder.

TECHNICAL PROBLEM

[0020] . Hence it would be desirable to modify and improve the prior art solution described in EP 2913461 so that the combinatory unit can offer a very high number of possible combinations.

SUMMARY OF THE INVENTION

[0021] . The main objective of the present invention is therefore to improve the prior art cylinder lock security device of the above-mentioned patent so as to considerably increase the number of combinations that can be obtained with the combinatory unit.

[0022] . In the scope of the above objective, one purpose of the present invention is to provide an improved security device for a cylinder lock without considerably increasing its dimensions with respect to the prior art device from Patent EP 2913461.

[0023] . Another purpose of the present invention is to provide an improved security device for a cylinder lock in which the structural simplicity and the ease of using it remain unchanged, or are improved, with respect to the device known from EP 2913461.

[0024] . One not secondary purpose is to provide an improved security device for a cylinder lock that achieves the objective and purposes indicated above at competitive costs and that can be obtained with the usual well-known machinery, plants and equipment.

[0025] . The above objective and purposes, and other ones that will be more evident in the description which follows, are achieved by an improved security device for a cylinder lock as defined in claim 1.

[0026] It thereby concerns a security device adapted to be coupled to a cylinder lock, said security device comprising a casing associable to said lock and provided with a first axial opening adapted to house a cylinder of said lock, said first axial opening being eccentrically arranged in respect to the center of said casing, a protective key-plate adapted to be coupled to said casing, said protective key-plate being provided with a second through-opening eccentrically arranged in respect to the center of said protective key-plate such that said second through-opening is aligned, in use, with said first opening, a slider movable in respect to said casing between a locking position, wherein said slider occludes said first open-

ing in order to prevent, in use, accessing said cylinder, and an unlocking position, wherein said slider allows accessing said first opening, and a magnetic combinatory unit movable together with said slider, a cavity facing, in use, said casing being provided on an inner surface of said protective key-plate, said cavity having a substantially linear extension and being arranged substantially parallel to the medial axis passing through said second through-opening and said protective key-plate, guide means being provided on each side of said cavity, said guide means comprising a first guiding surface arranged at a side of said cavity and a second guiding surface arranged at the opposite side of said cavity, said guide means including engaging means comprising at least a first recess and a second recess provided on said first guiding surface, and at least a third recess and a fourth recess provided on said second guiding surface, said slider comprising blocking means adapted to engage said engaging means to firmly block said slider into said locking position or unlocking position, said blocking means including a pair of pins provided with respective heads having a shape complementary to the shape of said engaging means, said heads being adapted to selectively engage said first recess and said third recess, when said slider is in said locking position, and said second recess and said fourth recess when said slider is in said unlocking position.

[0027] The device is furthermore characterized in that said magnetic combinatory unit includes at least four satellites, namely a first satellite, a second satellite, a third satellite and a fourth satellite each containing respective magnetic means, said at least four satellites being adapted to be rotatably housed into respective seats provided on said slider, said seats being mutually arranged at right angles, wherein said first recess axially faces said third recess and said second recess axially faces said fourth recess, said blocking means being controlled by said at least four satellites, wherein each of said first satellite, second satellite, third satellite and fourth satellite comprises one respective cut, said blocking means further comprising a first flared portion and a second flared portion respectively connecting said heads to the respective pins, said first flared portion being adapted to selectively cooperate with the respective cuts of said first satellite and said third satellite and said second flared portion being adapted to selectively cooperate with the respective cuts of said second satellite and said fourth satellite.

BRIEF DESCRIPTION OF THE FIGURES

[0028] . Further characteristics and the advantages of the present invention will become more evident from the following description of a particular, but not exclusive, embodiment illustrated purely by way of indicative but not limiting example with reference to the enclosed figures, wherein:

- figure 1 shows, in an exploded front perspective

- view, an improved security device for a cylinder lock according to the present invention;
- figure 2 illustrates the device of figure 1 in an exploded rear perspective view;
 - figure 3 illustrates the device of the previous figures in a front elevation and without cover of the casing in an initial operating phase of blocking the access to the lock.
 - figure 4 illustrates the device in the operating phase of fig. 3 with a magnetic actuator applied;
 - figures 5 and 6 illustrate, in views similar to the one of fig. 3, the device in intermediate operating phases of passage between the locked position and the unlocked position wherein access to the lock is allowed;
 - figure 7 illustrates the device in the final operating phase of unlocking access to the lock with the magnetic actuator applied;
 - figure 8 illustrates, in a view similar to the one of fig. 3, the device in the operating phase of unlocking the access to the lock after the removal of the magnetic actuator;
 - figure 9 is a cross section of the device according to the median vertical plan of figure 7.

DETAILED DESCRIPTION OF THE INVENTION

[0029] . With reference to the previously mentioned figures, the reference numeral 1 indicates a security device for a cylinder lock according to the present invention.

[0030] . The device comprises a casing 2, generally of cylindrical shape, designed to be associated to a lock and provided with a first axial opening 3 for inserting a cylinder (not shown in the enclosed figures). The first opening 3 is arranged in an eccentric position with respect to the centre of the casing 2.

[0031] . To protect the first opening 3, and thus the cylinder contained therein, a key-hole protection disk 4 can advantageously be provided rotatably associated to the casing 2 in a position corresponding to the first opening 3.

[0032] . The key-hole protection disk 4 is provided with a slit 5 to allow the insertion of a key in the lock cylinder.

[0033] . A protective key-plate 6 can be coupled to the casing 2 from the side opposite the direction of insertion of the cylinder so that, when in use, it is positioned on the door front facing outward.

[0034] . The protective key-plate 6 is provided with a second through opening 7 arranged eccentrically with respect to the centre of the key-plate 6 so that, when the device is mounted in place, it is positioned substantially aligned, preferably coaxially, with the first opening 3 of the casing 2 and, if present, with the key-hole protection disk 4.

[0035] . On the inner surface 8 of the key-plate 6 facing the casing 2 is provided a cavity 9 having an essentially rectilinear extension and oriented parallel to the medial axis passing through the second opening 7 and the key-plate 6.

[0036] . On each side of the cavity 9 are advantageously provided guide means 10, 11, consisting for example of a first guide surface 10 on one side of the cavity 9 and of a second guide surface 11 on the opposite side.

[0037] . The guide means 10, 11 include engaging means whose function will be better explained below, comprising, on one side, at least one first recess 12 and a second recess 13 and, on the opposite side, at least one third recess 14 and a fourth recess 15. The first recess 12 is arranged axially facing the third recess 14, and the second recess 13 is arranged axially facing the fourth recess 15.

[0038] . Advantageously, the walls of the cavity 9, or the first guide surface 10 and the second guide surface 11, are joined near the respective recesses 12, 13 and 14, 15 through an inclined plane or arc segment.

[0039] . A slider 16 is slidably accommodated inside the cavity 9 and movable between a locking position (figs. 3, 4), in which the slider 16 occludes the second opening 7 so as to close off and prevent access to the cylinder of the lock through the first opening 3 and, if present, the slit 5 on the key-hole protection disk 4, and an unlocking position (figs. 7, 8, 9), in which the slider 16 frees the passage through the second opening 7 to allow the user to insert the key into the cylinder through the slit 5 and the opening 3.

[0040] . In the body of the slider 16 can be housed a combinatory unit of magnetic type that is thus movable together with the slider 16.

[0041] . The combinatory unit includes at least four satellites 17, 18, 19, 20, each containing, within suitable cavities, respective magnetic means 21, 22, 23, 24; the rotation of the satellites, actuated by a suitable magnetic actuator as will be better explained below, allows or blocks the sliding of the cursor 16 by means of suitable blocking means 25, 26 controlled by the satellites 17, 18, 19, 20. At the travel limit positions of the slider 16, that is, when the slider 16 is in the upper, or locking, position to close the second opening 7 or in the lower, or unlocking position, the blocking means 25, 26 engage the engaging means, comprising the recesses 12, 13 and 14, 15, to stably block the slider 16 in those positions.

[0042] . On the circumference of each satellite 17, 18, 19, 20 is provided a respective first cut 38, a second cut 39, a third cut 40 and a fourth cut 41.

[0043] . The blocking means 25, 26 include a pair of pins 27, 28 provided with respective heads 30A, 30B having shapes, preferably semi-spherical, that are complementary to the shape of the recesses 12, 13, 14, 15 so that the heads 30A, 30B can selectively engage the recesses 12 and 14 or the recesses 13 and 15, depending on the operating position of the device. In addition, the pins 27, 28 have respective flared connecting portions 29A, 29B between the heads 30A, 30B and the stems of the pins 27, 28; the flared portion 29A of the pin 27 is suitable to cooperate with the first and the third cut 38, 40, while the flared portion 29B of the pin 28 is designed to cooperate with the second and the fourth cut 39, 41 in

accordance with the operating modes that will be better explained below. The pins 27, 28 are slidingly housed in a through hole 31 or in respective coaxial and opposite blind holes formed transversally to the slider 16 so that said pins 27, 28 are arranged axially opposite to each other and oriented with their heads facing in opposite directions.

[0044] . The pins 27, 28 slide counter to the bias of elastic means, such as a respective first spring 32 and second spring 33 arranged coaxially with the pins 27, 28 and in contact with suitable engagement means formed in the hole 31, or a single spring biasing against the heads of the pins 27, 28.

[0045] . The slider 16 is provided with a first seat 34, a second seat 35, a third seat 36 and a fourth seat 37 of essentially circular shape and reciprocally arranged two by two along parallel axes to essentially form a square or a rectangle. The seats 34, 35, 36, 37 are suitable to accommodate respectively, in a rotatable manner, the first, the second, the third and the fourth satellite 17, 18, 19, 20 provided with the respective first, second, third and fourth magnetic means 21, 22, 23, 24. The pairs formed, respectively, by the first seat 34 and second seat 35 and by the third seat 36 and fourth seat 37, and consequently the satellites 17, 18, 19, 20 housed in the respective seats, are arranged axially aligned with each other along an axis parallel to the axis defined by the through hole 31 and by opposite sides with respect to the through hole 31.

[0046] . The first, second, third and fourth magnetic means 21, 22, 23, 24 inserted in the respective first, second, third and fourth satellite 17, 18, 19, 20 each comprise a pair of magnets with opposite polarity S-N.

[0047] . Four washers 42, 43, 44, 45 are advantageously provided to maintain and cover the respective satellites 17, 18, 19, 20 in the respective seats 34, 35, 36, 37.

[0048] . The displacement of the slider 16 from the locking position to the unlocking position, and vice versa, is achieved by means of a magnetic actuator 47, known for example from Patent EP 2913461, provided with further magnetic means arranged according to an appropriate combination and suitable to interact with the first, second, third and fourth magnetic means 21, 22, 23, 24 contained respectively in the first, second, third and fourth satellite 17, 18, 19, 20 to cause the rotation of the latter, as will be better explained later.

[0049] . Advantageously, the slider 16 has a concavity 46 to avoid interfering, in the unlocking position shown in figure 8, with the second opening 7.

[0050] . The operation of the device is as follows: in the condition with the door closed with the security device actuated, and therefore with the slider 16 covering the second opening 7 from inside to prevent access to the lock (figs. 3, 4), the first spring 32 pushes axially the head 30A of the first pin 27 into engagement with the first recess 12, while the second spring 33 pushes axially the head 30B of the second pin 28 into engagement with the

third recess 14 along the same axis defined by the hole 31.

[0051] . The satellites 17, 18, 19, 20 are arranged so that a circumferential portion of each of them engages the flared portions 29A, 29B of the pins 27 and 28, in particular the first and the third satellite 17, 19 engage the flared portion 29A of the first pin 27, and the second and the fourth satellite 18, 20 engage, from an opposite side, the flared portion 29B of the second pin 28, blocking thereby the sliding of the pins 27, 28 along the hole 31 to prevent the disengagement of the heads 30A, 30B from the recesses 12, 14.

[0052] . The magnetic means 21, 22, 23, 24 are reciprocally arranged in a casual manner depending on the position imposed on them by the latest operation to unlock the magnetic actuator 47 to bring the device to the closing position.

[0053] . In the position described above, the movement of the slider 16 is blocked by the engagement of the heads 30A, 30B in the respective recesses 12, 14; the heads 30A, 30B are in turn blocked by the engagement of the satellites 17, 18, 19, 20 with the flared portions 29A, 29B, thus preventing the sliding of the pins 27, 28. With this configuration, the access to the cylinder and thus to the lock is completely prevented.

[0054] . To obtain the unlocking of the slider 16, and thus allow access to the cylinder to insert the key, it is necessary to set the magnetic actuator 47 against the external face of the security device at the second opening 7, covered internally by the slider 16.

[0055] . The specific magnetic combination prearranged on the actuator 47 is configured to impose a movement of the magnetic means 21, 22, 23, 24 so as to induce a rotation in opposite directions to the satellites 17, 18, 19, 20 to bring the respective cuts 38, 39, 40, 41 to face the flared portions 29A, 29B of the pins 27, 28.

[0056] . In particular, with reference to figure 5, the first and the third satellite 17, 19 accomplish respectively a rotation in a clockwise and a counterclockwise direction to bring the respective cuts 38, 40 to face the flared portion 29A, while the second and the fourth satellite 18, 20 rotate respectively in a counterclockwise and clockwise direction to bring the respective cuts 39, 41 to face the flared portion 29B.

[0057] . In this manner, the movement of the opposed pins 27, 28 is no longer blocked by the satellites 17, 18, 19, 20, and therefore said pins 27, 28 are free to slide along the hole 31 to disengage the heads 30A, 30B from the respective recesses 12, 14. The free sliding of the pins 27, 28 is however countered elastically by the springs 32, 33, which however push the heads 30A, 30B into engagement in the respective recesses 12, 14, as shown in figure 5.

[0058] . To disengage the heads 30A and 30B it is therefore necessary to pull the magnetic actuator 47 downward, keeping it always in contact with the security device 1 to thus obtain as a consequence the guided movement downward of the slider 16, containing the

magnetic combinatorial unit, along the walls of the cavity 9 or, if present, of the guide means 10, 11. The arc-shaped or inclined-plane profile of the walls of the cavity 9, or of the guide means 10, 11 if present, makes it possible to advance the pins 27, 28 slidingly along the hole 31 to disengage the heads 30A, 30B from the recesses 12, 14, overcoming the elastic reaction of the springs 32, 33, as exemplified in figure 6; in this manner, the second opening 7 is gradually made accessible to make it possible, once the operation is completed, to insert the key to open the lock.

[0059] . At the end of the slider 16 travel, and therefore with the second opening 7 completely accessible, the heads 30A, 30B of the pins 27, 28, pushed by the action of the springs 32, 33, engage respectively the second and the fourth recess 13, 15; the subsequent removal of the magnetic actuator 47 at the end of the slider 16 travel returns the satellites 17, 18, 19, 20 to the initial position with respective inverse rotations with respect to the previous rotations, as shown in figures 7 and 8. The rotations of the satellites 17, 18, 19, 20 block the heads 30A, 30B of the pins 27, 28 in the respective seats 13, 15, since the flared portions 29A, 29B are no longer interfaced with the cuts 38, 39, 40, 41, which now are turned in opposite directions, but they face the circumferential portions of the satellites 17, 18, 19, 20. In this manner, the slider 16 is blocked in the unlocking position of the device, as the sliding of the pins 27, 28 along the hole 31 is prevented.

[0060] . To return the security device 1 to the position of access to the second opening 7 locked, it is sufficient to repeat the above operations in reverse, by positioning the magnetic actuator 47 on the device 1 to cause the rotation of the satellites 17, 18, 19, 20 so as to disengage the heads 30A, 30B from the respective seats 13, 15 and allow the sliding upward of the slider 16 pulled by the magnetic actuator 47.

[0061] . The advantageous presence of inclined planes or of arc-shaped sections connecting the recesses 12, 13, 14, 15, defined by the walls of the cavity 9 or by the guide means 10, 11, facilitates the disengagement of the heads 30A, 30B and makes it easier for the user to move the actuator 47 without exerting considerable efforts.

[0062] . From the above description, it is evident how the present invention achieves the initially outlined purposes and advantages: in effect, an improved lock security device was devised with the capability of considerably increasing the number of combinations that can be obtained with the combinatorial unit. In fact, the increase from two to four satellites, each housing as many magnetic means, formed by a pair of magnets of opposite polarity, makes it possible to increase with a factorial progression the number of obtainable combinations.

[0063] . It is pointed out that the increase of the number of satellites does not also entail an increase in the dimension and size of the device, which however remains compact and can be matched with the standard dimensions of the locks. This is thanks to the particular compact configuration of the combinatorial unit, in which the satellites

17, 18, 19, 20 are housed in the slider 16 aligned two by two from opposite sides with respect to the blocking means 25, 26 that block the movement of the slider 16. The blocking means 25, 26 are thus interposed between the two pairs of satellites so as to be able to interact simultaneously with two satellites arranged perpendicularly with respect to the axis defined by the blocking means 25, 26.

[0064] . The device according to the present invention is also of simple construction and easy for the user to use.

[0065] . Naturally, the present invention is susceptible of many applications, modifications or variants, without thereby departing from the scope of patent protection as defined by claim 1.

[0066] . Furthermore, the materials and equipment used to implement the present invention, as well as the shapes and dimensions of the individual components, can be the most appropriate to the specific requirements.

Claims

1. Security device adapted to be coupled to a cylinder lock, said security device (1) comprising a casing (2) associable to said lock and provided with a first axial opening (3) adapted to house a cylinder of said lock, said first axial opening (3) being eccentrically arranged in respect to the center of said casing (2), a protective key-plate (6) adapted to be coupled to said casing (2), said protective key-plate (6) being provided with a second through-opening (7) eccentrically arranged in respect to the center of said protective key-plate (6) such that said second through-opening (7) is aligned, in use, with said first opening (3), a slider (16) movable in respect to said casing (2) between a locking position, wherein said slider (16) occludes said first opening (3) in order to prevent, in use, accessing said cylinder, and an unlocking position, wherein said slider (16) allows accessing said first opening (3), and a magnetic combinatorial unit (17, 18, 19, 20, 21, 22, 23, 24) movable together with said slider (16), a cavity (9) facing, in use, said casing (2) being provided on an inner surface (8) of said protective key-plate (6), said cavity (9) having a substantially linear extension and being arranged substantially parallel to the medial axis passing through said second through-opening (7) and said protective key-plate (6), guide means (10, 11) being provided on each side of said cavity (9), said guide means (10, 11) comprising a first guiding surface (10) arranged at a side of said cavity (9) and a second guiding surface (11) arranged at the opposite side of said cavity (9), said guide means (10, 11) including engaging means (12, 13, 14, 15) comprising at least a first recess (12) and a second recess (13) provided on said first guiding surface (10), and at least a third recess (14) and a fourth recess (15) provided on said second guiding surface (11), said

slider (16) comprising blocking means (25, 26) adapted to engage said engaging means (12, 13, 14, 15) to firmly block said slider (16) into said locking position or unlocking position, said blocking means (25, 26) including a pair of pins (27, 28) provided with respective heads (30A, 30B) having a shape complementary to the shape of said engaging means (12, 13, 14, 15), said heads (30A, 30B) being adapted to selectively engage said first recess (12) and said third recess (14), when said slider (16) is in said locking position, and said second recess (13) and said fourth recess (15) when said slider (16) is in said unlocking position, **characterized in that** said magnetic combinatory unit (17, 18, 19, 20, 21, 22, 23, 24) includes at least four satellites (17, 18, 19, 20), namely a first satellite (17), a second satellite (18), a third satellite (19) and a fourth satellite (20) each containing respective magnetic means (21, 22, 23, 24), said at least four satellites (17, 18, 19, 20) being adapted to be rotatably housed into respective seats (34, 35, 36, 37) provided on said slider (16), said seats being mutually arranged at right angles, wherein said first recess (12) axially faces said third recess (14) and said second recess (13) axially faces said fourth recess (15), said blocking means (25, 26) being controlled by said at least four satellites (17, 18, 19, 20), wherein each of said first satellite (17), second satellite (18), third satellite (19) and fourth satellite (20) comprises one respective cut (38, 39, 40, 41), said blocking means (25, 26) further comprising a first flared portion (29A) and a second flared portion (29B) respectively connecting said heads (30A, 30B) to the respective pins (27, 28), said first flared portion (29A) being adapted to selectively cooperate with the respective cuts (38, 40) of said first satellite (17) and said third satellite (19) and said second flared portion (29B) being adapted to selectively cooperate with the respective cuts (39, 41) of said second satellite (18) and said fourth satellite (20).

2. Security device as in claim 1, wherein said slider (16) is adapted to be slidably accommodated inside said cavity (9) so as to be movable along said first guiding surface (10) and said second guiding surface (11) between said locking position and said unlocking position.
3. Security device as in claim 1, wherein said blocking means (25, 26) are slidably associated to said slider (16) and movable in opposite directions along a transverse axis of said slider (16) against the bias of elastic means, said blocking means (25, 26) being arranged axially opposed with said heads (30A, 30B) facing opposite sides.
4. Security device as in claim 1, wherein the passage between said locking position and said unlocking po-

sition, and viceversa, is actuatable by a magnetic actuator (47) provided with a combination adapted to cooperate with said magnetic combinatory unit (17, 18, 19, 20, 21, 22, 23, 24) to impart a rotation to said at least four satellites (17, 18, 19, 20) able to disengage said blocking means (25, 26) from said engaging means (13, 14, 15, 16) such that moving said slider (16) from said locking position to said unlocking position, and viceversa, is allowed.

5. Security device as in claim 4, wherein said rotation imparted to said at least four satellites (17, 18, 19, 20) by said magnetic actuator (47) causes said cuts (38, 40) of said first and third satellites (17, 19) to face said first flared portion (29A) and said cuts (39, 41) of said second and fourth satellites (18, 20) to face said second flared portion (29B) so as to allow said blocking means (25, 26) sliding to disengage said heads (30A, 30B) from said engaging means (12, 13, 14, 15) such that moving said slider (16) from said locking position to said unlocking position, and viceversa, is allowed.

Patentansprüche

1. Sicherheitsvorrichtung, die mit einem Zylinderschloss gekoppelt werden kann, wobei die Sicherheitsvorrichtung (1) ein Gehäuse (2) umfasst, das mit dem Schloss verbunden werden kann und mit einer ersten axialen Öffnung (3) versehen ist, die einen Zylinder des Schlosses aufnehmen kann, wobei die erste axiale Öffnung (3) exzentrisch in Bezug auf die Mitte des Gehäuses (2) angeordnet ist, eine schützende Schlüsselplatte (6), die an das Gehäuse (2) gekoppelt werden kann, wobei die schützende Schlüsselplatte (6) mit einer zweiten Durchgangsöffnung (7) versehen ist, die in Bezug auf die Mitte der schützenden Schlüsselplatte (6) exzentrisch angeordnet ist, so dass die zweite Durchgangsöffnung (7) im Gebrauch zu der ersten Öffnung (3) ausgerichtet ist, einen Gleiter (16), der in Bezug auf das Gehäuse (2) zwischen einer Verriegelungsposition beweglich ist, bei der der Gleiter (16) die erste Öffnung (3) verschließt, um im Gebrauch den Zugang zu dem Zylinder zu verhindern, und einer Entriegelungsposition, bei der der Gleiter (16) den Zugang zu der ersten Öffnung (3) ermöglicht, und eine magnetische Kombinationseinheit (17, 18, 19, 20, 21, 22, 23, 24), die zusammen mit dem Gleiter (16) bewegbar ist, einen Hohlraum (9), der im Gebrauch dem Gehäuse (2) zugewandt ist, das auf einer Innenfläche (8) der schützenden Schlüsselplatte (6) vorgesehen ist, wobei der Hohlraum (9) eine im Wesentlichen lineare Ausdehnung hat und im Wesentlichen parallel zu der durch die zweite Durchgangsöffnung (7) und die schützende Schlüsselplatte (6) verlaufenden Mittelachse angeordnet ist, wobei Füh-

rungsmittel (10, 11) auf jeder Seite des Hohlraums (9) vorgesehen sind, wobei die Führungsmittel (10, 11) eine erste Führungsfläche (10) umfassen, die an einer Seite des Hohlraums (9) angeordnet ist, und eine zweite Führungsfläche (11), die auf der gegenüberliegenden Seite des Hohlraums (9) angeordnet ist, wobei die Führungsmittel (10, 11) Eingriffsmittel (12, 13, 14, 15) beinhalten, die mindestens eine erste Aussparung (12) und eine zweite Aussparung (13) umfassen, die auf der ersten Führungsfläche (10) vorgesehen sind, und mindestens eine dritte Aussparung (14) und eine vierte Aussparung (15), die auf der zweiten Führungsfläche (11) vorgesehen sind, wobei der Gleiter (16) Blockiermittel (25, 26) umfasst, die zum Eingriff mit den Eingriffsmitteln (12, 13, 14, 15) geeignet sind, um den Gleiter (16) in der Verriegelungsposition oder Entriegelungsposition fest zu blockieren, wobei die Blockiermittel (25, 26) ein Paar Stifte (27, 28) beinhalten, die mit entsprechenden Köpfen (30A, 30B) versehen sind, die eine zu der Form der Eingriffsmittel (12, 13, 14, 15) komplementäre Form aufweisen, wobei die Köpfe (30A, 30B) dazu eingerichtet sind, selektiv in die erste Aussparung (12) und die dritte Aussparung (14) einzugreifen, wenn sich der Gleiter (16) in der Verriegelungsposition befindet, und in die zweite Aussparung (13) und die vierte Aussparung (15), wenn sich der Gleiter (16) in der Entriegelungsposition befindet, **dadurch gekennzeichnet, dass** die magnetische Kombinationseinheit (17, 18, 19, 20, 21, 22, 23, 24) mindestens vier Satelliten (17, 18, 19, 20) beinhaltet, nämlich einen ersten Satelliten (17), einen zweiten Satelliten (18), einen dritten Satelliten (19) und einen vierten Satelliten (20), die jeweils entsprechende magnetische Mittel (21, 22, 23, 24) enthalten, wobei die mindestens vier Satelliten (17, 18, 19, 20) dazu eingerichtet sind, drehbar in entsprechenden Sitzen (34, 35, 36, 37) untergebracht zu werden, die auf dem Gleiter (16) vorgesehen sind, wobei die Sitze gegenseitig in rechten Winkeln angeordnet sind, wobei die erste Aussparung (12) axial der dritten Aussparung (14) und die zweite Aussparung (13) axial der vierten Aussparung (15) gegenüberliegt, wobei die Blockiermittel (25, 26) durch die mindestens vier Satelliten (17, 18, 29, 20) gesteuert werden, wobei jeder der ersten Satelliten (17), zweiten Satelliten (18), dritten Satelliten (19) und vierten Satelliten (20) jeweils einen entsprechenden Einschnitt (38, 39, 40, 41) umfasst, wobei die Blockiermittel (25, 26) ferner einen ersten aufgeweiteten Abschnitt (29A) und einen zweiten aufgeweiteten Abschnitt (29B) umfassen, die jeweils die Köpfe (30A, 30B) mit den jeweiligen Stiften (27, 28) verbinden, wobei der erste aufgeweitete Abschnitt (29A) dazu ausgelegt ist, selektiv mit den jeweiligen Schnitten (38, 40) des ersten Satelliten (17) und des dritten Satelliten (19) zusammenzuwirken, und der zweite aufgeweitete Abschnitt (29B) dazu ausgelegt ist, selektiv mit den je-

weiligen Schnitten (39, 41) des zweiten Satelliten (18) und des vierten Satelliten (20) zusammenzuwirken.

2. Sicherheitsvorrichtung nach Anspruch 1, wobei der Gleiter (16) dazu eingerichtet ist, gleitfähig in dem Hohlraum (9) aufgenommen zu werden, so dass er entlang der ersten Führungsfläche (10) und der zweiten Führungsfläche (11) zwischen der Verriegelungsposition und der Entriegelungsposition beweglich ist.
3. Sicherheitsvorrichtung nach Anspruch 1, wobei die Blockiermittel (25, 26) gleitfähig mit dem Gleiter (16) verbunden und in entgegengesetzten Richtungen entlang einer Querachse des Gleiters (16) gegen die Vorspannung elastischer Mittel beweglich sind, wobei die Blockiermittel (25, 26) axial gegenüberliegend angeordnet sind, während die Köpfe (30A, 30B) entgegengesetzten Seiten zugewandt sind.
4. Sicherheitsvorrichtung nach Anspruch 1, wobei der Durchgang zwischen der Verriegelungsstellung und der Entriegelungsstellung und umgekehrt durch ein magnetisches Betätigungselement (47) betätigbar ist, das mit einer Kombination versehen ist, die mit der magnetischen Kombinationseinheit (17, 18, 19, 20, 21, 22, 23, 24) zusammenwirken kann, um den mindestens vier Satelliten (17, 18, 19, 20), die in der Lage sind, die Blockiermittel (25, 26) von den Eingriffsmitteln (13, 14, 15, 16) zu lösen, eine Drehung zu verleihen, so dass eine Bewegung des Gleiters (16) von der Verriegelungsposition in die Entriegelungsposition und umgekehrt möglich ist.
5. Sicherheitsvorrichtung nach Anspruch 4, wobei die den mindestens vier Satelliten (17, 18, 19, 20) durch das magnetische Betätigungselement (47) erteilte Drehung bewirkt, dass die Schnitte (38, 40) des ersten und dritten Satelliten (17, 19) dem ersten aufgeweiteten Abschnitt (29A) zugewandt sind und die Schnitte (39, 41) des zweiten und vierten Satelliten (18, 20) dem zweiten aufgeweiteten Abschnitt (29B) zugewandt ist, so dass die Blockiermittel (25, 26) gleiten können, um die Köpfe (30A, 30B) aus den Eingriffsmitteln (12, 13, 14, 15) zu lösen, damit eine Bewegung des Gleiters (16) aus der Verriegelungsstellung in die Entriegelungsstellung und umgekehrt möglich ist.

Revendications

1. Dispositif de sécurité adapté à être couplé à une serrure à cylindre, ledit dispositif de sécurité (1) comprenant un boîtier (2) pouvant être associé à ladite serrure et pourvu d'une première ouverture (3) axiale adaptée à loger un cylindre de ladite serrure, ladite

première ouverture (3) axiale étant agencée de manière excentrique par rapport au centre dudit boîtier (2), une plaque de propreté de protection (6) adaptée à être couplée audit boîtier (2), ladite plaque de propreté de protection (6) étant pourvue d'une deuxième ouverture (7) traversante agencée de manière excentrique par rapport au centre de ladite plaque de propreté de protection (6) de telle sorte que ladite deuxième ouverture (7) traversante est alignée, en cours d'utilisation, avec ladite première ouverture (3), un coulisseau (16) mobile par rapport audit boîtier (2) entre une position de verrouillage, dans laquelle ledit coulisseau (16) obstrue ladite première ouverture (3) afin d'empêcher, en cours d'utilisation, d'accéder audit cylindre, et une position de déverrouillage, dans laquelle ledit coulisseau (16) permet d'accéder à ladite première ouverture (3), et à une unité magnétique combinatoire (17, 18, 19, 20, 21, 22, 23, 24) mobile avec ledit coulisseau (16), une cavité (9) faisant face, en cours d'utilisation, audit boîtier (2) est prévue sur une surface interne (8) de ladite plaque de propreté de protection (6), ladite cavité (9) ayant une extension sensiblement linéaire et étant disposée sensiblement parallèlement à l'axe médian passant à travers ladite deuxième ouverture (7) traversante et ladite plaque de propreté de protection (6), des moyens de guidage (10, 11) étant prévus de chaque côté de ladite cavité (9), lesdits moyens de guidage (10, 11) comprenant une première surface de guidage (10) disposée d'un côté de ladite cavité (9) et une deuxième surface de guidage (11) disposée du côté opposé de ladite cavité (9), lesdits moyens de guidage (10, 11) comprenant des moyens d'engagement (12, 13, 14, 15) comprenant au moins un premier évidement (12) et un deuxième évidement (13) prévus sur ladite première surface de guidage (10), et au moins un troisième évidement (14) et un quatrième évidement (15) prévus sur ladite deuxième surface de guidage (11), ledit coulisseau (16) comprenant des moyens de blocage (25, 26) adaptés à engager lesdits moyens d'engagement (12, 13, 14, 15) pour bloquer fermement ledit coulisseau (16) dans ladite position de verrouillage ou dans ladite position de déverrouillage, lesdits moyens de blocage (25, 26) comprenant une paire de broches (27, 28) munies de têtes respectives (30A, 30B) ayant une forme complémentaire à la forme desdits moyens d'engagement (12, 13, 14, 15), lesdites têtes (30A, 30B) étant adaptées à engager sélectivement ledit premier évidement (12) et ledit troisième évidement (14), lorsque ledit coulisseau (16) est dans ladite position de verrouillage, et ledit deuxième évidement (13) et ledit quatrième évidement (15) lorsque ledit coulisseau (16) est dans ladite position de déverrouillage, **caractérisé en ce que** ladite unité de combinaison magnétique (17, 18, 19, 20, 21, 22, 23, 24) comprend au moins quatre satellites (17, 18, 19, 20), à savoir un premier satellite

(17), un deuxième satellite (18), un troisième satellite (19) et un quatrième satellite (20), contenant chacun des moyens magnétiques respectifs (21, 22, 23, 24), lesdits au moins quatre satellites (17, 18, 19, 20) étant adaptés à être logés de manière mobile en rotation dans des sièges respectifs (34, 35, 36, 37) prévus sur ledit coulisseau (16), lesdits sièges étant disposés mutuellement à angle droit, dans lequel ledit premier évidement (12) fait face axialement audit troisième évidement (14) et ledit deuxième évidement (13) fait face axialement audit quatrième évidement (15), lesdits moyens de blocages (25, 26) étant contrôlés par lesdits au moins quatre satellites (17, 18, 19, 20), dans lequel chacun desdits premier satellite (17), deuxième satellite (18), troisième satellite (19) et quatrième satellite (20) comprend une coupe respective (38, 39, 40, 41), lesdits moyens de blocage (25, 26) comprenant en outre une première partie évasée (29A) et une deuxième partie évasée (29B) reliant respectivement lesdites têtes (30A, 30B) aux broches respectives (27, 28), ladite première partie évasée (29A) étant adaptée à coopérer sélectivement avec les coupes respectives (38, 40) dudit premier satellite (17) et dudit troisième satellite (19) et ladite deuxième partie évasée (29B) étant adaptée à coopérer sélectivement avec les coupes respectives (39, 41) dudit deuxième satellite (18) et dudit quatrième satellite (20).

2. Dispositif de sécurité selon la revendication 1, dans lequel ledit coulisseau (16) est adapté à être logé de manière coulissante à l'intérieur de ladite cavité (9) de manière à être mobile le long de ladite première surface de guidage (10) et de ladite deuxième surface de guidage (11) entre ladite position de verrouillage et ladite position de déverrouillage.
3. Dispositif de sécurité selon la revendication 1, dans lequel lesdits moyens de blocage (25, 26) sont associés de façon coulissante audit coulisseau (16) et mobiles dans des directions opposées le long d'un axe transversal dudit coulisseau (16) contre la sollicitation de moyens élastiques, lesdits moyens de blocage (25, 26) étant disposés axialement opposés auxdites têtes (30A, 30B) faisant face à des côtés opposés.
4. Dispositif de sécurité selon la revendication 1, dans lequel le passage entre ladite position de verrouillage et ladite position de déverrouillage, et inversement, peut être actionné par un actionneur magnétique (47) pourvu d'une combinaison adaptée à coopérer avec ladite unité combinatoire magnétique (17, 18, 19, 20, 21, 22, 23, 24) pour conférer une rotation auxdits au moins quatre satellites (17, 18, 19, 20) capables de désengager lesdits moyens de blocage (25, 26) desdits moyens d'engagement (13, 14, 15, 16) de telle sorte que le déplacement dudit coulis-

seau (16) de ladite position de verrouillage à ladite position de déverrouillage, et inversement, est autorisé.

5. Dispositif de sécurité selon la revendication 4, dans lequel ladite rotation conférée auxdits au moins quatre satellites (17, 18, 19, 20) par ledit actionneur magnétique (47) amène lesdites coupes (38, 40) desdits premier et troisième satellites (17, 19) à faire face à ladite première partie évasée (29A) et lesdites coupes (39, 41) desdits deuxième et quatrième satellites (18, 20) à faire face à ladite deuxième partie évasée (29B) de manière à permettre auxdits moyens de blocage (25, 26) de coulisser pour dégager lesdites têtes (30A, 30B) desdits moyens d'engagement (12, 13, 14, 15) de sorte que le déplacement dudit coulisseau (16) de ladite position de verrouillage à ladite position de déverrouillage, et inversement, est permis.

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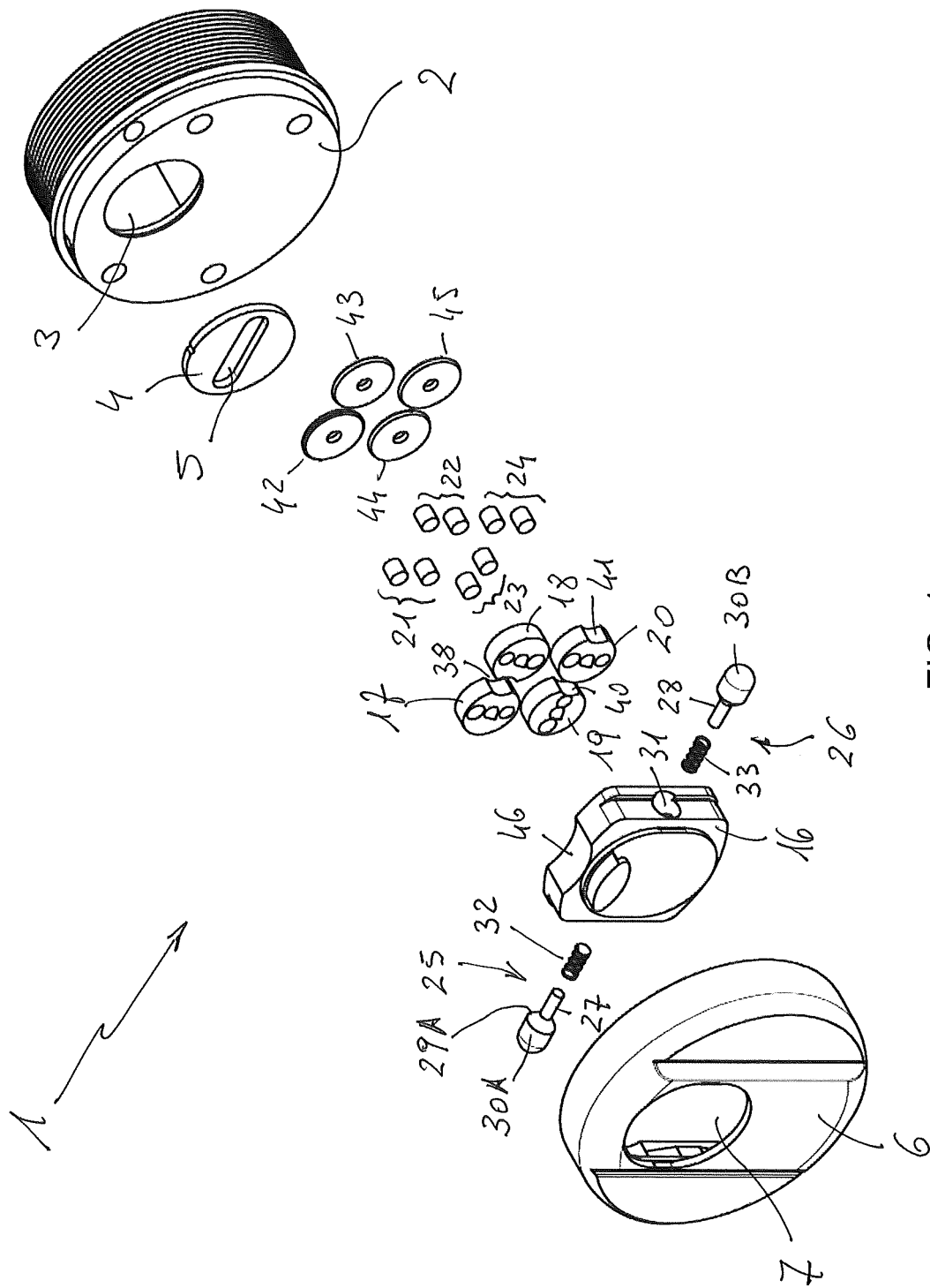


FIG. 1

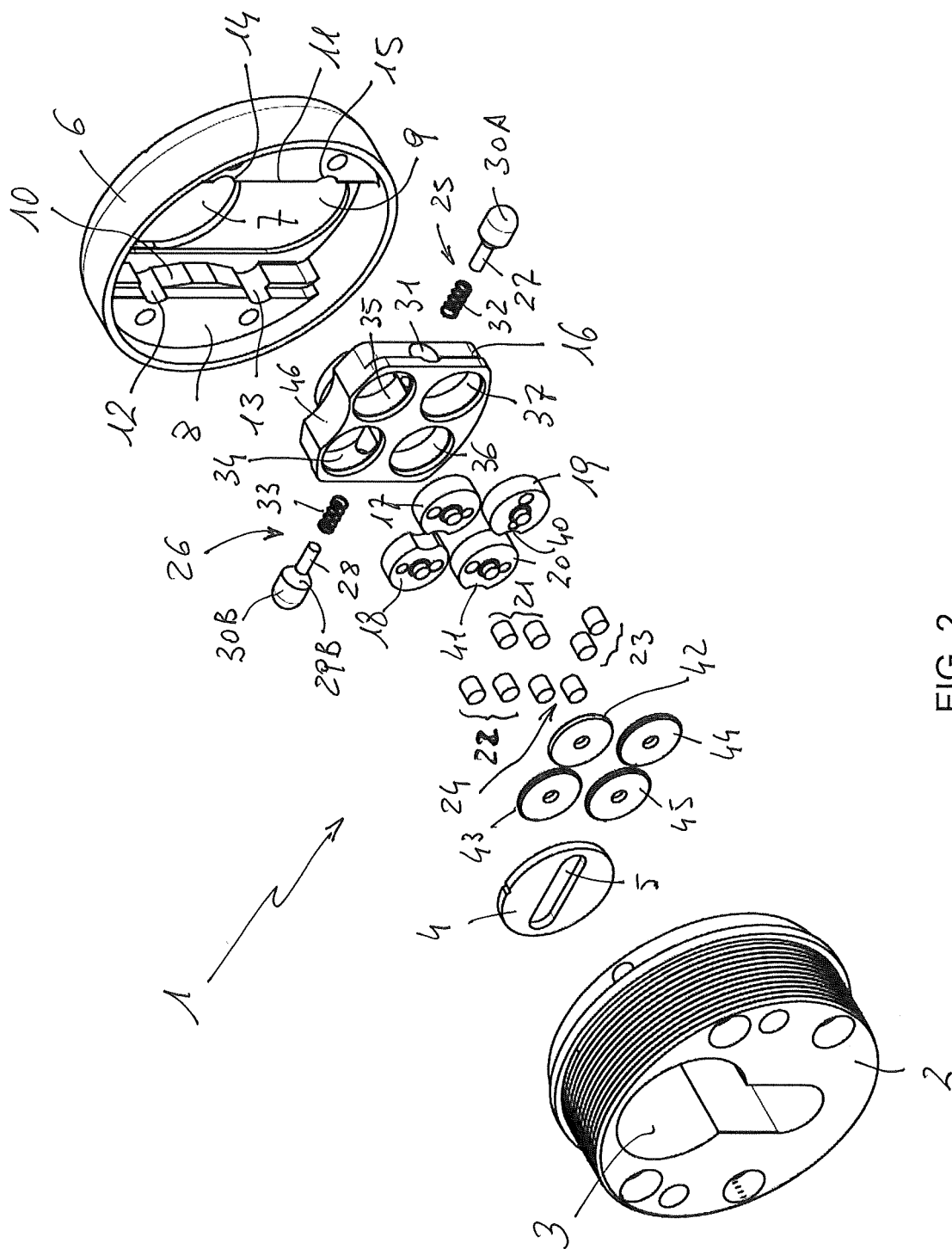
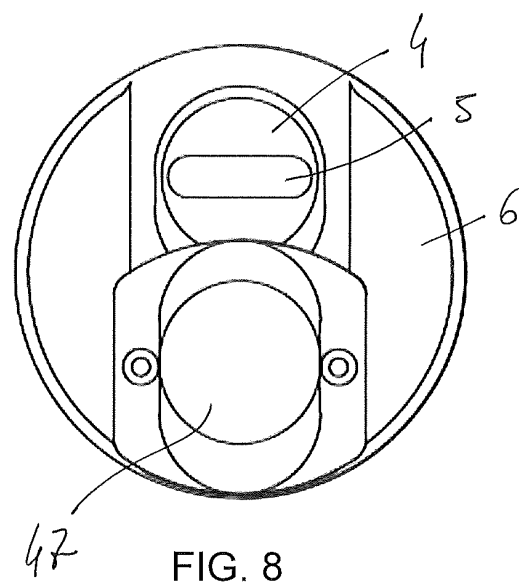
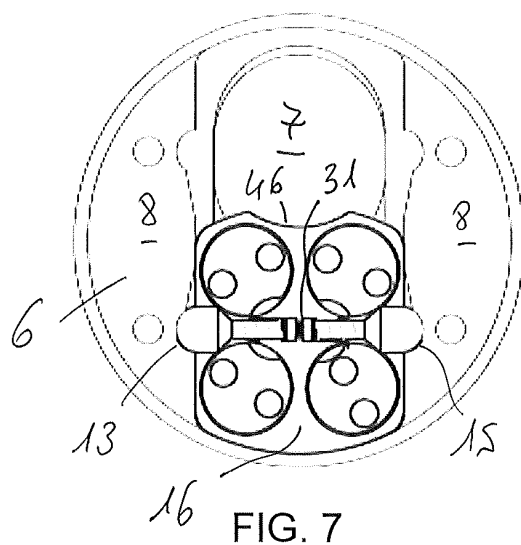
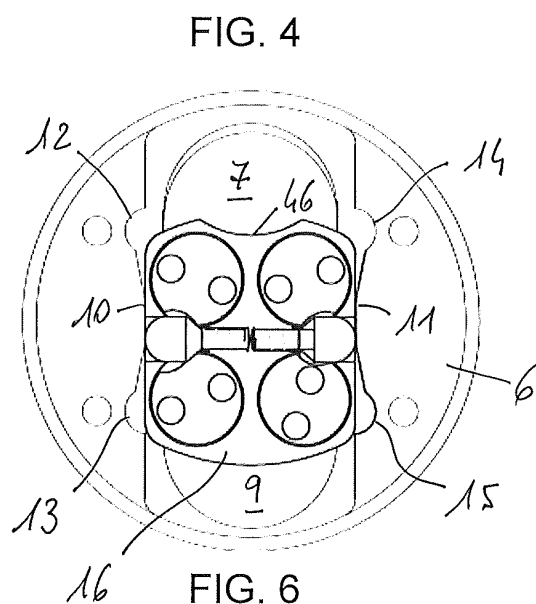
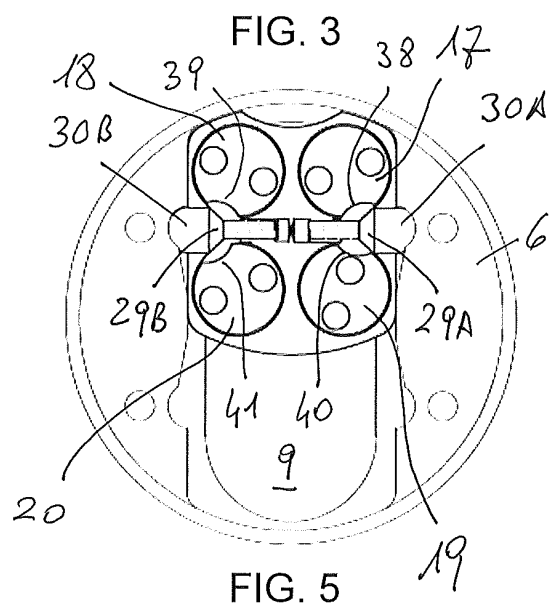
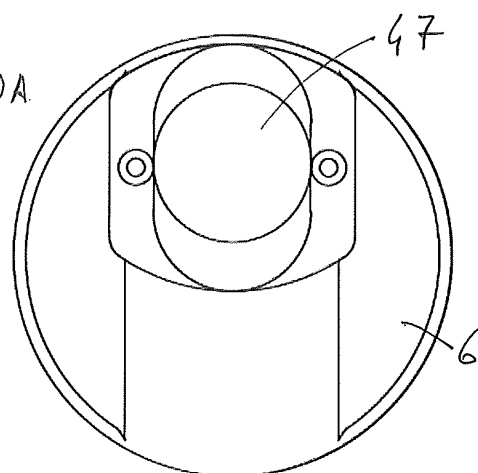
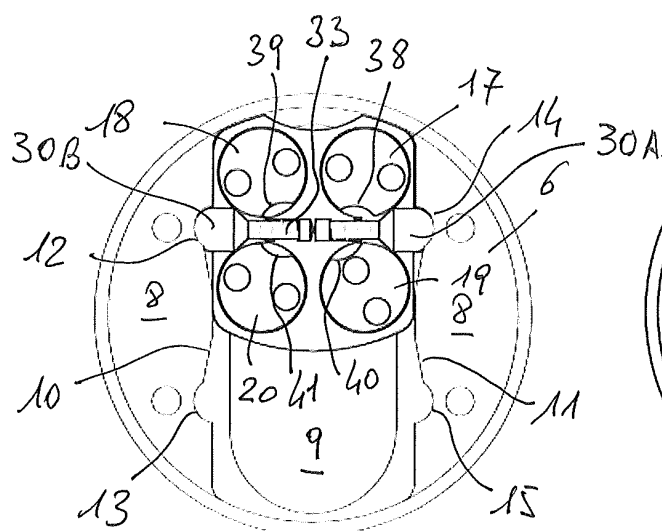


FIG. 2



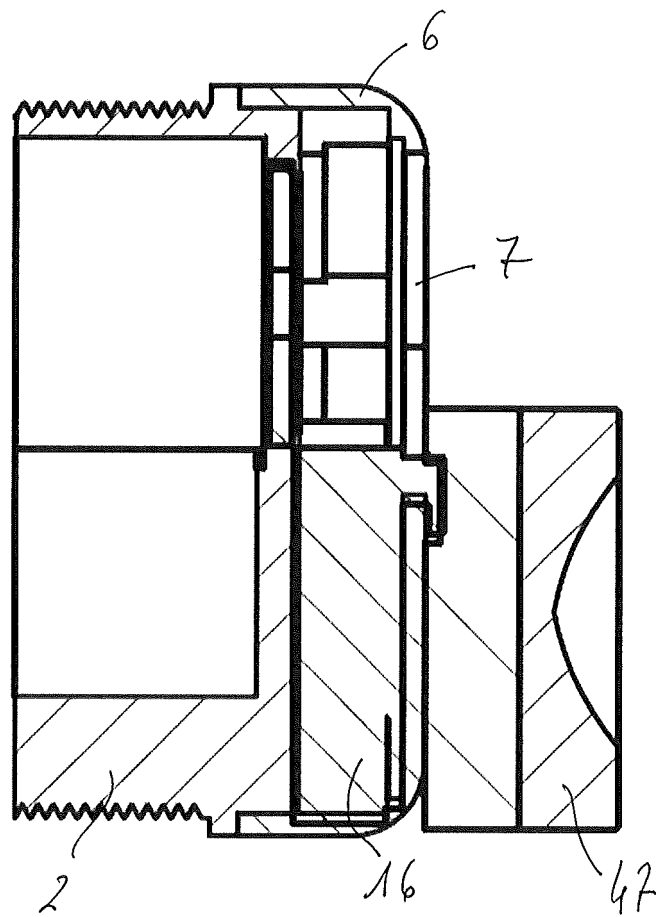


FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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