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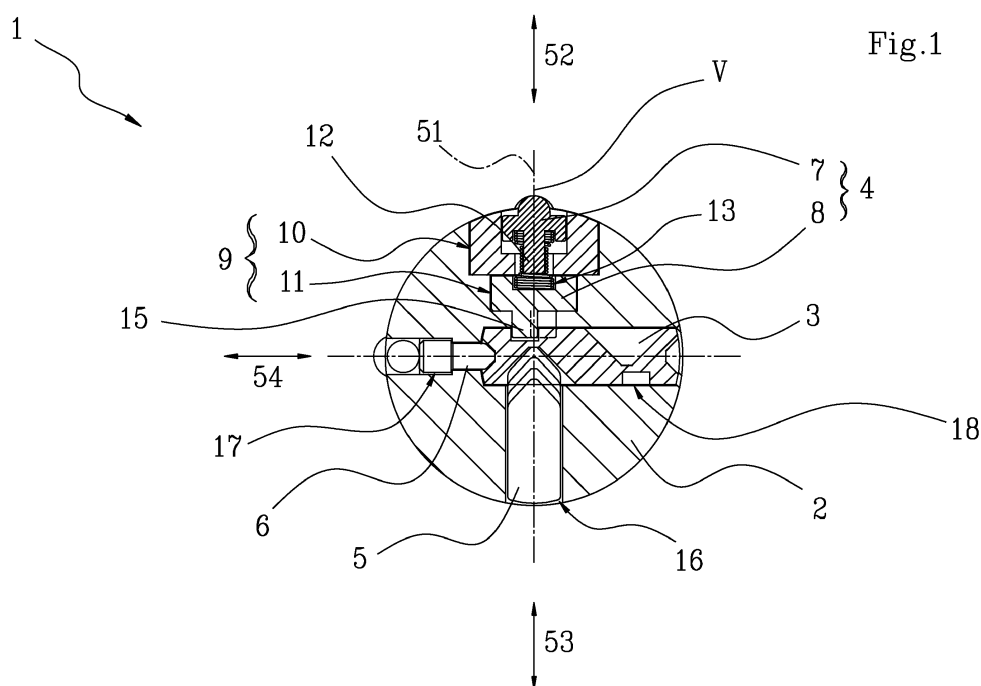
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(54)

ROTOR FOR A CYLINDER LOCK AND METHOD FOR REALISING A ROTOR

(57) A rotor (1) for a cylinder lock (100), comprising:
a main body (2) extending along a longitudinal direction
(P); a seat (3) adapted to house a key; a locking element
(7) movable between a locked configuration and a dis-
engaged configuration; a plurality of rotating elements
(8) arranged inside the main body (2) and in sequence
with each other along said longitudinal direction (P). Each
of the rotating elements (8) is able to rotate about its own
axis of rotation (51) perpendicular to the longitudinal di-
rection (P) during the insertion of the key inside the seat
(3). Furthermore, each of the rotating elements (8) has
a groove (13) to receive at least a portion of the locking
element (7) to allow the latter to assume the disengaged
configuration. The locking element (7) is movable be-
tween the locked condition and the disengaged condition
along a work direction (52) parallel to the axis of rotation
(51). A further object of the present invention application
is a method for realising said rotor (1).



Description

TECHNICAL FIELD

[0001] The present invention concerns a rotor for a cylinder lock. In particular, the invention relates to the rotor of security cylinder locks installed on doors or windows in general, to ensure greater security against tampering from the outside (so-called "lockpicking" and "bumping").

[0002] Furthermore, the present invention concerns a method for realising a rotor for a cylinder lock, said rotor being installable in a respective stator.

PRIOR ART

[0003] Currently, in order to ensure a satisfactory level of security against the possible tampering of doors or windows in general, the use of cylinder locks is known.

[0004] An example of cylinder locks is disclosed in document EP1019601.

[0005] Basically, these locks are constituted by a stator, a rotor and a number of security members able to interpose themselves between the stator and the rotor itself. Normally, the security members are in a condition which locks the movement of the rotor with respect to the stator, but the insertion of a specific key within the rotor allows their switching to an unlocked condition and, consequently, allows the opening of the lock.

SUMMARY

[0006] In this context, the technical task underlying the present invention is to propose a rotor for a cylinder lock which allows a greater number of bittings, so as to increase the security offered.

[0007] In addition, the present invention seeks to propose a rotor for a lock of a door or window, which is simple to realise, in order to make the production process more efficient.

[0008] Another object of the present invention is to provide a method for realising a rotor for cylinder locks with a reduced number of processing steps.

[0009] The stated technical task and specified objects are substantially reached by a rotor for a security cylinder lock and a method for realising the rotor, which comprise the technical features disclosed in the independent claims. The dependent claims correspond to further advantageous aspects of the invention.

[0010] It should be highlighted that this summary introduces, in a simplified form, a selection of concepts which will be further elaborated in the detailed description given below. Therefore this summary is not intended to be used to limit the scope of the matters claimed.

[0011] The embodiments of the present invention address these purposes and obtain other advantages by providing a rotor for a cylinder lock, which comprises:

- a main body extending along a longitudinal direction;

- a seat extending along at least one part of the longitudinal direction and adapted to house a key insertable along an insertion direction substantially parallel to the longitudinal direction;

- 5 - a locking element movable between a locked configuration, in which it is only partially inserted inside the main body to interfere, in use, with a stator adapted to receive the rotor, and a disengaged configuration, in which it is totally inserted inside the main body;

- 10 - a plurality of rotating elements arranged inside the main body and in sequence with each other along the longitudinal direction.

- 15 **[0012]** Each of the rotating elements is able to rotate about its own axis of rotation substantially perpendicular to the longitudinal direction during the insertion of the key inside the seat. In addition, each of the rotating elements has a groove to receive at least a corresponding portion of the locking element to allow the latter to assume the disengaged configuration.

- 20 **[0013]** The locking element is movable between the locked condition and the disengaged condition along a work direction substantially parallel to the axis of rotation of each rotating element.

- 25 **[0014]** Preferably, each rotating element is housed in a cavity communicating with the seat.

- 30 **[0015]** Even more preferably, the cavity houses each rotating element and the locking element. The locking element and the plurality of rotating elements define a first security member of the rotor.

- 35 **[0016]** The locking element and the plurality of rotating elements, together defining a first security member, are arranged adjacent in the rotor for their optimal operation and advantageously in the same cavity formed in the main body. According to one aspect of the invention, the cavity comprises a housing for containing the locking element and a first series of compartments to hold each rotating element.

- 40 **[0017]** Advantageously, for the correct and optimal operation of the first security member, specific compartments are formed in the cavity for containing the rotating elements and a specific housing is formed for containing the locking element.

- 45 **[0018]** Preferably, the housing and the series of compartments are made without any break in continuity.

- [0019]** In this way, the useful processing for obtaining such compartments and such housing will be executed in the shortest time possible, saving production time and thus reducing costs.

- 50 **[0020]** According to one aspect of the invention, each rotating element is interposed between the locking element and the seat.

- 55 **[0021]** Advantageously, an arrangement of the rotating elements and the locking element in sequence reduces the encumbrance of the first security member and, consequently, the processes to be performed on the main body of the rotor.

[0022] According to another aspect of the invention, the locking element comprises a plurality of appendages each of which is able to be inserted in a corresponding groove made on each rotating element to allow the locking element to assume the disengaged configuration.

[0023] Preferably, the rotor comprises at least one elastic element operatively interposed between the locking element and at least one of the rotating elements for maintaining the locking element normally in the locked configuration.

[0024] According to one aspect of the invention, each rotating element comprises a pin that is misaligned from the axis of rotation of the rotating element to allow the rotation of each rotating element during the insertion of a key in the seat. The pin is turned towards the seat so as to interact with a track provided on a surface of a key during the insertion of the latter in the seat. Preferably, the pin is positioned on the opposite side to the groove with respect to a primary body of each rotating element.

[0025] According to one aspect of the invention, each rotating element is arranged in the respective compartment with the respective pin arranged along a predetermined biting direction. The biting direction is incident with the respective axis of rotation of the rotating element itself and variable between a direction parallel to the insertion direction and a direction perpendicular to the insertion direction. Each pin is also arranged along its biting direction regardless of the arrangement of the other pins.

[0026] Preferably, each of the pins is arranged along the biting direction in an outer position, wherein the pin is substantially interposed between the respective axis of rotation and a mouth of the seat from which the key is inserted, or in an inner position, in which the respective axis of rotation is substantially interposed between the pin itself and the mouth of the seat. Advantageously, the arrangement of the rotating elements within the respective compartments determines a multiplicity of different bittings which increase the security that the lock is able to guarantee. In fact, according to the present invention, the rotating elements can be installed such that the pins of each are pointing towards the inside of the central body, or towards the outside, or, alternatively, in any alternate way.

[0027] According to a further aspect of the invention, the rotor comprises

- a plurality of second security members slidably inserted inside the main body and arranged in sequence with each other along the longitudinal direction. The plurality of second security members is movable along a first direction substantially perpendicular to the insertion direction; and
- a plurality of third security members slidably inserted inside the main body and in sequence with each other along the insertion direction. The plurality of third security members is movable along a second direction substantially perpendicular to the insertion di-

rection.

[0028] Advantageously, the presence of additional security members, such as the second and third, makes it possible to increase the degree of security offered by the lock comprising such a rotor.

[0029] According to one aspect of the invention, the first, second and third security members can be deactivated by a predefined key.

[0030] A cylinder lock installable on doors or windows, comprising:

- a rotor according to the preceding description; and
- a stator adapted to house the rotor.

[0031] The stator has an engagement seat adapted to receive a portion of the locking element when the latter is in the locked configuration to prevent the rotation of the rotor with respect to the stator.

[0032] In accordance with the invention, a method for realising a rotor for a cylinder lock is described, which comprises the operating steps of:

- i. providing a main body of the rotor;
- ii. performing a first process for obtaining the seat for the insertion of a key;
- iii. performing a second process for obtaining the housing for containing the locking element;
- iv. performing a third process for obtaining the first series of compartments for containing each rotating element,

such that the second process and the third process take place along a same operating direction.

[0033] Advantageously, performing a machining operation, for example milling, along the same operating direction reduces the production time of the rotor and consequently reduces labour costs.

[0034] Preferably, the operating direction is substantially parallel to the axis of rotation of the rotating elements of the rotor.

[0035] In this way, the cavity formed will contain the plurality of rotating elements oriented correctly with respect to the seat, i.e. in such a way that their axis of rotation is perpendicular to the flat surface of the key itself.

[0036] According to one aspect of the invention, the method comprises the further operating steps of:

- i. performing a fourth process along a first direction inclined with respect to the operating direction for obtaining a second series of compartments for the insertion of each second security member;
- ii. performing a fifth process along a second direction inclined with respect to the operating direction for obtaining a third series of compartments for the insertion of each third security member,

such that the first, second, third, fourth and fifth processes can be performed according to any succession.

[0037] Advantageously, during the realisation of the rotor, the processes performed on the main body can be performed without a predetermined order.

[0038] Finally, the method comprises the further step of inserting each rotating element into the respective compartment so that the respective pin is oriented in an outer position, wherein it is turned towards a mouth of the seat or in an inner position opposite the outer position with respect to the relative axis of rotation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0039] Additional features and advantages of the present invention will become more apparent from an approximate, and thus non-limiting, description of a preferred, but non-exclusive embodiment of a rotor for a cylinder lock, as illustrated in the appended drawings, in which:

- figure 1 is a sectional front view of the rotor;
- figures 2 and 3 are, respectively from above and below, an exploded view of the rotor and a relative key for opening;
- figure 4 illustrates a sectional side view of a lock fitted with the rotor, when the key is inserted in a relative seat;
- figure 5 illustrates a sectional top view of the rotor which shows the arrangement of security members, when the key is inserted in the seat;
- figure 6 illustrates a further partially sectioned view of the lock of figure from above, to show further constructive details;
- figures 7 and 8 illustrate the rotor, respectively, in a locked configuration and a disengaged configuration inside a stator.

[0040] It should be noted that the drawings serve solely to illustrate embodiments of the invention with the aim of better clarifying, in combination with the description, the inventive principles at the basis of the invention.

DETAILED DESCRIPTION

[0041] The present invention concerns a rotor for a cylinder lock.

[0042] With reference to the figures, a rotor of a cylinder lock has been generically indicated with the number 1.

[0043] The other numerical references refer to technical features of the invention which, notwithstanding other indications or evident structural incompatibilities, the person skilled in the art will know how to apply to all the variant embodiments described.

[0044] With particular reference to figures 1 and 2, the rotor 1 comprises a main body 2 which extends along a longitudinal direction P (orthogonal to the plane of figure

1), a seat 3 adapted to house a key insertable along an insertion direction 50, a locking element 7 and a plurality of elements 8 rotating around their own axis of rotation 51.

[0045] As can be better seen in figures 7 and 8, the locking element 7 is movable between a locked configuration, in which it is only partially inserted inside the main body 2 to interfere, in use, with a stator 101 adapted to receive the rotor 1, and a disengaged configuration, in which it is totally inserted inside the main body 2. In more detail and as can be seen in figures 1 and 2, the locking element 7 is movable between the locked condition and the disengaged condition along a work direction 52 substantially parallel to the axis of rotation 51 of each rotating element 8.

[0046] In security cylinder locks keys are usually used with a rectangular cross-section comprising a pair of surfaces, on which a series of "S" countersinks and "C" tracks are formed, and a pair of side edges, on which "K" recesses are formed. The "S" countersinks, "C" tracks and "K" recesses cooperate with security members 4, 5, 6 (visible, for example, in figures 1 and 4) in the rotor 1 to obtain the locking or unlocking of a lock 100 (figures 7 and 8). As can be seen in figure 2, the seat 3 in which the key is inserted to allow the movement of the rotor 1 with respect to the stator 101 has a rectangular cross-section. Such seat 3 extends along at least a portion of the depth P of the rotor 1 and, preferably, is formed offset with respect to the central axis of the rotor 1 itself.

[0047] As can be seen in figures 2 and 3, a first security member 4 of the lock 100 is defined by the locking element 7 and by the plurality of rotating elements 8, usually pins, such that each rotating element 8 is interposed between the locking element 7 and the seat 3 of insertion of the key.

[0048] Each of the rotating elements 8 has a groove 13 to receive at least a corresponding portion of the locking element 7 to allow the latter to assume the disengaged configuration.

[0049] To allow each groove 13 to receive a corresponding portion of the locking element 7, the rotating elements 8 are able to rotate around their own axis of rotation 51, which is substantially perpendicular to the longitudinal direction P, during the insertion of the key inside the seat 3. In fact, each rotating element 8 comprises a pin 15 so as to interact with one "C" track present on the surface of the key during the insertion of the latter into the seat 3. In this way, the "C" track engages each pin 15, and following the advancement of the key inside the seat, causes a rotation of each rotating element 8.

[0050] According to one aspect of the invention, each pin 15 is positioned misaligned with respect to the axis of rotation 51 and is turned towards the seat 3. Preferably, moreover, each pin is positioned on the opposite side to the groove 13 with respect to a primary body of each rotating element 8.

[0051] In accordance with a further aspect of the invention, and with reference, for example, to figures 2 and 3, the positioning of the rotating element 8 inside the re-

spective compartment 11, and consequently the positioning of the pin 15 inside the seat 3, makes it possible to obtain a multiplicity of bittings, so as to increase the security that the rotor 1 is able to provide.

[0052] Substantially, each pin 15 can be arranged in an outer position, wherein it is turned toward the outside of the main body 2, that is, towards a mouth 18 of the seat 3 from which the key is inserted.

[0053] Alternatively, each pin 15 can be arranged in an inner position in such a way as to be turned toward a bottom 2a of the main body 2, i.e. on the side opposite said outer position with respect to the axis of rotation 51 of the rotating element 8. Specifically, each pin 15 is arranged along a bitting direction, or range 55, passing through the axis of rotation 51 of each rotating element 8. In particular, each pin 15 can assume a plurality of angular positions around the axis of rotation 51, while remaining always in said inner position or in said outer position.

[0054] In other words, the above-mentioned outer position envisages that the pin 15 is arranged in the semi-space comprised between a plane passing through the axis of rotation 51 orthogonally to the insertion direction 50 and the mouth 18 of the seat 3, while the inner position is opposite the outer position with respect to the said same plane passing through the axis of rotation 51 and is defined by the semi-space comprised between the axis of rotation itself and a bottom 2a of the rotor opposite the mouth 18. For example, each pin 15 can assume positions rotated by 180° with respect to the axis of rotation 51 of the rotating element 8 and thus define different bittings.

[0055] According to a further embodiment, the rotating elements 8 can be installed in a mixed manner, i.e. with some pins 15 facing towards the mouth of the seat 3 and the others with the pins 15 facing towards the inside of the main body 2.

[0056] Advantageously, the presence of a plurality of rotating elements 8 and the variability in positioning the same within the respective compartments 11, i.e. on the basis of a desired orientation of the pins 15, allows creating a multiplicity of different bittings, which contribute to increasing the security of the lock 100.

[0057] With particular reference to figure 2, each rotating element 8 is housed in a cavity 9 communicating with the seat 3, such that each pin 15 protrudes inside the seat 3 itself.

[0058] In particular, the cavity 9 comprises a housing 10 for containing the locking element 7 and a series of said compartments 11, each of which contains a respective rotating element 8.

[0059] In accordance with one aspect of the invention, the housing 10 and the series of compartments 11 are made without any break in continuity. Advantageously, this configuration makes it possible to obtain the housing 10 and the compartments 11 with a process performed along a same vertical direction which is marked with the letter "V" in the illustrated example and is parallel to the

work direction 52.

[0060] For example, as can be seen in figures 3 and 4, the rotating elements 8 are arranged inside the main body 2 in sequence with each other along the longitudinal direction P.

[0061] In accordance with another aspect of the invention, the locking element 7 comprises a plurality of aligned appendages 12, each of which can be inserted in the corresponding groove 13 made on each rotating element 8 to allow the locking element 7 itself to assume the disengaged configuration and allow the rotation of the rotor 1 with respect to the stator 101.

[0062] With particular reference to figures 7 and 8, to maintain the locking element 7 normally in the locked configuration, at least one elastic element 14 is operatively interposed between the locking element 7 itself and at least one of the rotating elements 8.

[0063] As can be seen in figure 3, the locking element 7 is preferably arranged inside a box-like element 20 positioned in the housing 10. Advantageously, the box-like element acts as a guide during the movement of the locking element 7, improving the working precision during the engagement phase of the appendages 12 inside the grooves 13 and avoiding malfunctions. With reference to figures 2 and 3, the box-like element 20 has at least one opening at each appendage 12 of the locking element 7, such that the latter can switch between the locked position and the disengaged position. In accordance with this embodiment of the invention, each compartment 11 is counter-shaped to a respective rotating element 8 and the housing 10 is shaped to contain the box-like element 20 and the locking element 7. With particular reference to figures 1, 7 and 8, the rotor 1, in addition to the first security member 4, comprises second and third security members 5, 6, both slidably inserted inside the main body 2 and movable along a direction substantially perpendicular to the insertion direction 50. In particular, the second security members 5 are movable along a first direction 53, while the third security members 6 are movable along a further direction 54.

[0064] In accordance with one aspect of the invention, the second security members 5 comprise a plurality of first pegs, preferably tapered and referred to as "small active pistons", which are arranged in sequence with each other along the longitudinal direction P of the main body 2.

[0065] Each second security member 5 is slidably inserted inside the main body 2, which has a second series of compartments 16. These compartments 16 have a radial extension that connects the exterior of the main body 2 with a portion of the seat 3, such that the second security members 5 interact with "S" countersinks (figure 2) present on the surface of the key, during the insertion or extraction of the same from the seat 3.

[0066] In accordance with a further aspect of the invention, the third security members 6 comprise a plurality of second pegs, so-called "small passive pistons", also arranged in sequence with each other along the longitu-

dinal direction P of the main body 2.

[0067] Each third security member is slidably inserted inside the main body 2, which has a third series of compartments 17 having a radial extension that connects the exterior of the main body 2 with a portion of the seat 3. The third security members 6 interact with the "K" recesses (figure 2) present on the edge of the key during the insertion or extraction of the latter from the seat 3.

[0068] According to this aspect of the invention, the second series of compartments 16 is inclined with respect to the third series of compartments 17 at an angle substantially equal to 90°. Preferably, therefore, the third security members 6 are movable along a second direction 54 substantially perpendicular to the insertion direction 50 and to the first direction 53 of movement of the second security members 5.

[0069] Summing up what has just been described, when a key is inserted in the seat 3, the end portions of the security members 5 and the end portions of the security members 6 penetrate, respectively, the "S" countersinks and "K" recesses of the key itself. In addition, upon insertion of the key with a predefined (correct) "C" track, the rotating elements 8 rotate, aligning the grooves 13, so as to house the appendages 12 and allow the locking element 7 to move along its work direction 52.

[0070] That which was just described can be seen in figures 4-8, in which it can be noted that the first, second and third security members 4, 5, 6 are deactivated (and activated) by a predefined key. In particular, figures 7 and 8 show the different arrangement of the security members 4, 5, 6 when the key is respectively inserted and removed from the seat 3.

[0071] A further object of the present invention is a lock cylinder 100 illustrated in figures 7 and 8.

[0072] This lock 100 comprises the rotor 1 inserted inside the stator 101.

[0073] In accordance with one aspect of the invention, the stator 101 has an engagement seat 102 adapted to receive a portion of the locking element 7 when the latter is in the locked configuration to prevent the rotation of the rotor 1 with respect to the stator 101.

[0074] Preferably, the locking element 7 is positioned above the insertion seat 3 of the key and is therefore movable along a direction perpendicular to the surface of the key which has the "S" countersinks and the "C" track.

[0075] In accordance with a further aspect of the invention, the stator 101 has respective additional seats and additional cavities for the operation of the security members 5, 6. In particular, further elastic elements are slidably inserted in the further recesses of the stator 101 adapted to cooperate with the second security members 5, one for each second security member 5, such that when the key is absent, said elastic elements maintain the second security members (e.g. small active pistons) in a position interposed between the rotor 1 and the stator 101, as shown in figure 4.

[0076] The third security members 6 can engage the

further seats of the stator 101 when the key is not inserted in the seat 3. This adds a level of security to the lock 100, making it more secure to eventual tampering.

[0077] On the contrary, when the key is fully inserted inside the seat 3, the security members 4, 5, 6 are deactivated and the movement of the rotor 1 relative to the stator 101 of the lock 100 is allowed. Specifically, as can be seen in figure 8, with the insertion of the key into the seat 3, the following is obtained:

- the second security members 5 engage the respective "S" countersinks present on the key's surface, such as to be totally contained inside the main body 2, while the further elastic elements remain housed in the stator 101;
- the third security members 6 engage in the respective "K" recesses on the edge of the key, to be completely contained inside the main body 2 and not interposed between the rotor 1 and the stator 101;
- following the "C" track present on the surface of the key, the pins 15 rotate the rotating elements 8 around their axis of rotation 51, aligning the grooves 13 between them to allow them to house the appendages 12 of the locking element 7.

[0078] Following the rotation of the key by a user and the alignment of the grooves 13, which can thus receive the appendages 12, the elastic element 14, which normally keeps the locking element 7 in the locked configuration, is able to compress, allowing the locking element 7 to disengage from the stator 101.

[0079] Preferably, the engagement seat 102 and a protruding portion of the locking element 7 are bevelled. Advantageously, it is therefore sufficient to impart a rotational movement to the rotor 1 via the inserted key to allow the release of the first security members 4, and thus allow the movement of the rotor 1 with respect to the stator 101.

[0080] A further object of the present invention application relates to a method for realising the rotor 1 described above.

[0081] The method for realising the rotor 1 comprises the operating steps of:

- i. providing a main body 2 of the rotor 1;
- ii. performing a first process for obtaining the seat 3 for the insertion of a key;
- iii. performing a second process for obtaining the housing 10 for containing the locking element 7;
- iv. performing a third process for obtaining the first series of compartments 11 for containing each rotating element 8,

wherein the second process and the third process take place along a same operating direction "V".

[0082] Preferably, this operating direction "V" is parallel to the axis of rotation 51 of each rotating element 8, so that the cavity 9 is positioned above the seat 3 and

facing the surface of the key when the latter is inserted.

[0083] Given the mobility of the locking element 7 along the work direction 52, the series of compartments 11 and the housing 10 can be advantageously formed on the main body 2, also with a single process and, in any case, with a reduced number of processes that take place all along the same operating direction "V", thus reducing the processing times and manipulations of the rotor 1.

[0084] This method can also comprise the additional operating steps of:

- i. performing a fourth process along a first direction 53 inclined with respect to the operating direction "V" for obtaining a second series of compartments 16 for the insertion of each second security member 5;
- ii. performing a fifth process along a second direction 54 inclined with respect to the operating direction "V" for obtaining a third series of compartments 17 for the insertion of each third security member 6.

[0085] The method also comprises the further step of inserting each rotating element 8 in the respective compartment 11 so that the respective pin 15 is oriented in an outer position, wherein it is turned toward the outside of the rotor 1 substantially along the insertion direction 50 of the key, or in an inner position, wherein it is turned toward the inside of the rotor 1 substantially along the same insertion direction 50 of the key.

[0086] According to one aspect of the invention, each above-mentioned process (first, second, third, fourth and fifth) can be performed according to any succession.

[0087] Preferably, one or more processes take place through milling.

[0088] Any modifications or variants which, in the light of the description, are evident to the person skilled in the art, must be considered to fall within the scope of protection established by the present invention, according to considerations of technical equivalence.

Claims

1. A rotor (1) for a cylinder lock (100), comprising:

- a main body (2) extending along a longitudinal direction (P);
- a seat (3) extending along at least one part of said longitudinal direction (P) and adapted to house a key insertable along an insertion direction (50) substantially parallel to said longitudinal direction (P);
- a locking element (7) movable between a locked configuration, in which it is only partially inserted inside the main body (2) to interfere, in use, with a stator (101) adapted to receive the rotor (1), and a disengaged configuration, in which it is totally inserted inside the main body (2);

- a plurality of rotating elements (8) arranged inside the main body (2) and in sequence with each other along said longitudinal direction (P), each of said rotating elements (8) being able to rotate about its own axis of rotation (51) substantially perpendicular to said longitudinal direction (P) during the insertion of the key inside the seat (3), each of said rotating elements (8) having a groove (13) to receive at least a corresponding portion of said locking element (7) to allow the latter to assume the disengaged configuration;

each rotating element (8) and locking element (7) being housed in a cavity (9) communicating with said seat (3); said cavity (9) comprising a housing (10) for containing the locking element (7) and a first series of compartments (11) for containing each rotating element (8); said locking element (7) being movable between said locked condition and said disengaged condition along a work direction (52) substantially parallel to the axis of rotation (51) of each rotating element (8),

characterized in that said housing (10) and said first series of compartments (11) are made without any break in continuity and are aligned with the rotation axis (51) of the rotating elements (7) of the rotor (1).

2. The rotor (1) according to claim 1, wherein each rotating element (8) is interposed between the locking element (7) and the seat (3).
3. The rotor (1) according to any one of the preceding claims, wherein the locking element (7) comprises a plurality of appendages (12) each of which is able to be inserted in a corresponding groove (13) made on each rotating element (8) to allow the locking element (7) to assume the disengaged configuration.
4. The rotor (1) according to any one of the preceding claims, comprising at least one elastic element (14) operatively interposed between the locking element (7) and at least one of said rotating elements (8) for maintaining the locking element (7) normally in the locked configuration.
5. The rotor (1) according to any one of the preceding claims, wherein each rotating element (8) comprises a pin (15) that is misaligned from the axis of rotation (51) of the rotating element (8) to allow the rotation of each rotating element (8) during the insertion of a key in the seat (3), said pin (15) being turned towards said seat (3) so as to interact with a track (C) provided on a surface of a key during the insertion of the latter in the seat (3).
6. The rotor (1) according to claim 5, wherein said pin

(15) is positioned on the opposite side to said groove (13) with respect to a primary body of each rotating element (8).

7. The rotor (1) according to claim 6, wherein each rotating element (8) is arranged in the respective compartment (11) with the respective pin (15) arranged along a predetermined biting direction (55); said biting direction (55) being incident with the respective axis of rotation (51) of the rotating element (8) and variable between a direction parallel to the insertion direction (50) and a direction perpendicular to the insertion direction (50); each pin (15) being arranged along the respective biting direction (55) regardless of the arrangement of the other pins (15) along the respective biting directions (55).

8. The rotor (1) according to claim 7, wherein each of said pins (15) is arranged along said biting direction (55) in an outer position, wherein said pin (15) is substantially interposed between the axis of rotation (51) of the rotating element (8) and a mouth (18) of said seat (3) from which the key is inserted, or in an inner position in which the axis of rotation (51) of the rotating element (8) is substantially interposed between the pin (15) itself and the mouth (18) of said seat (3).

9. The rotor (1) according to any one of the preceding claims, comprising:

- a plurality of second security members (5) slidably inserted inside said main body (2) and in sequence with each other along said longitudinal direction (P), said plurality of second security members (5) being movable along a first direction (53) substantially perpendicular to said insertion direction (50); and
- a plurality of third security members (6) slidably inserted inside said main body (2) and in sequence with each other along said insertion direction (50), said plurality of third security members (6) being movable along a second direction (54) substantially perpendicular to said insertion direction (50).

10. The rotor (1) according to claim 9, wherein said first, second and third security members (4, 5, 6) can be deactivated by a predefined key.

11. A cylinder lock (100) installable on doors or windows, comprising:

- a rotor (1) according to any one of claims 1 to 10;
- a stator (101) adapted to house the rotor (1), said stator (101) having an engagement seat (102) adapted to receive a portion of the locking

element (7) when it is in the locked configuration to prevent the rotation of the rotor (1) with respect to the stator (101).

12. A method for realising a rotor (1) according to any one of claims 1 to 10, said method comprising the operating steps of:

- providing a main body (2) of the rotor (1);
- performing a first process for obtaining said seat (3) for the insertion of a key;
- performing a second process for obtaining said housing (10) for containing the locking element (7);
- performing a third process for obtaining said first series of compartments (11) for containing each rotating element (8),

characterised in that said second process and said third process take place along the same operating direction (V).

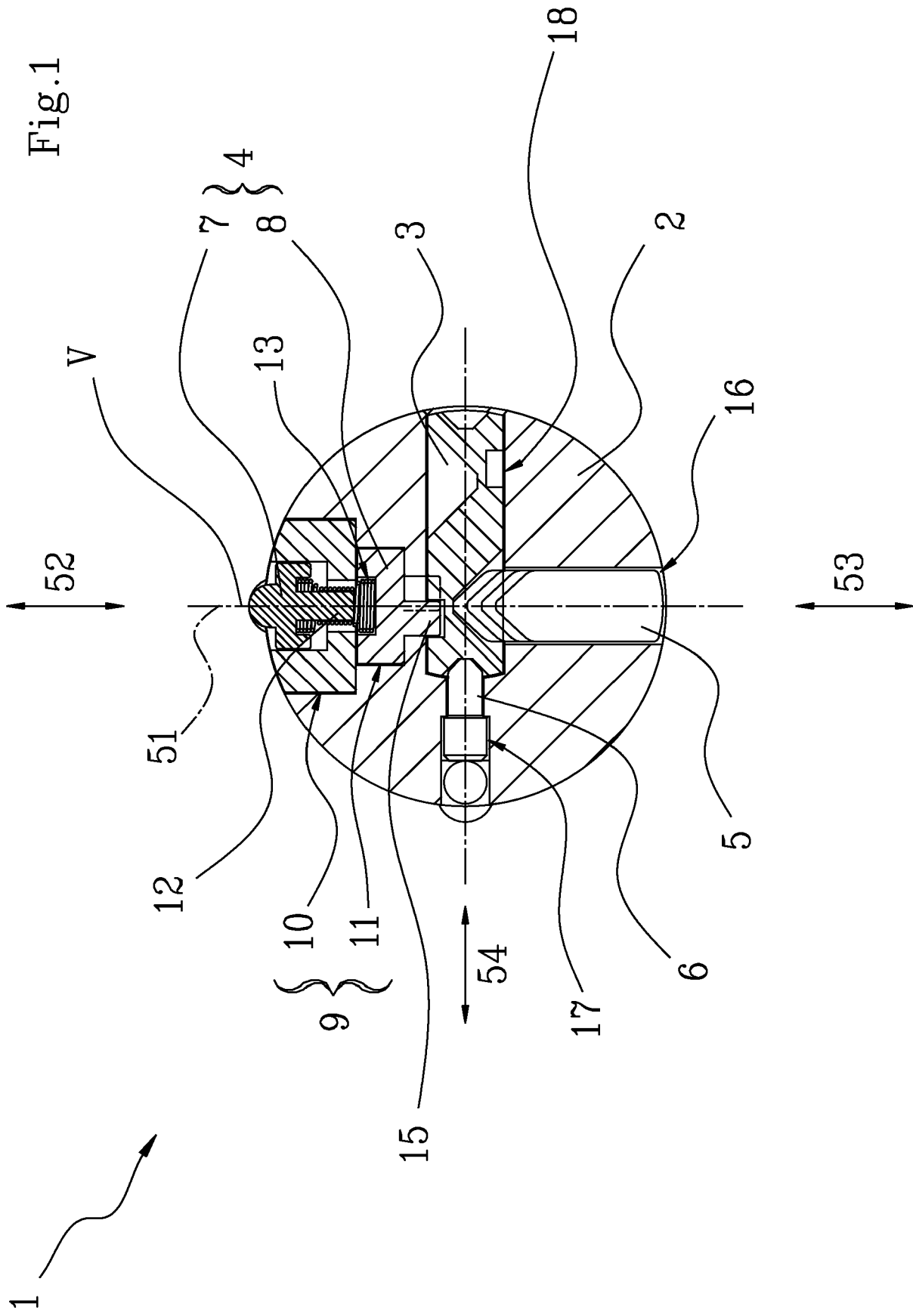
13. The method according to claim 12, wherein said operating direction (V) is substantially parallel to the axis of rotation (51) of the rotating elements (8) of the rotor (1).

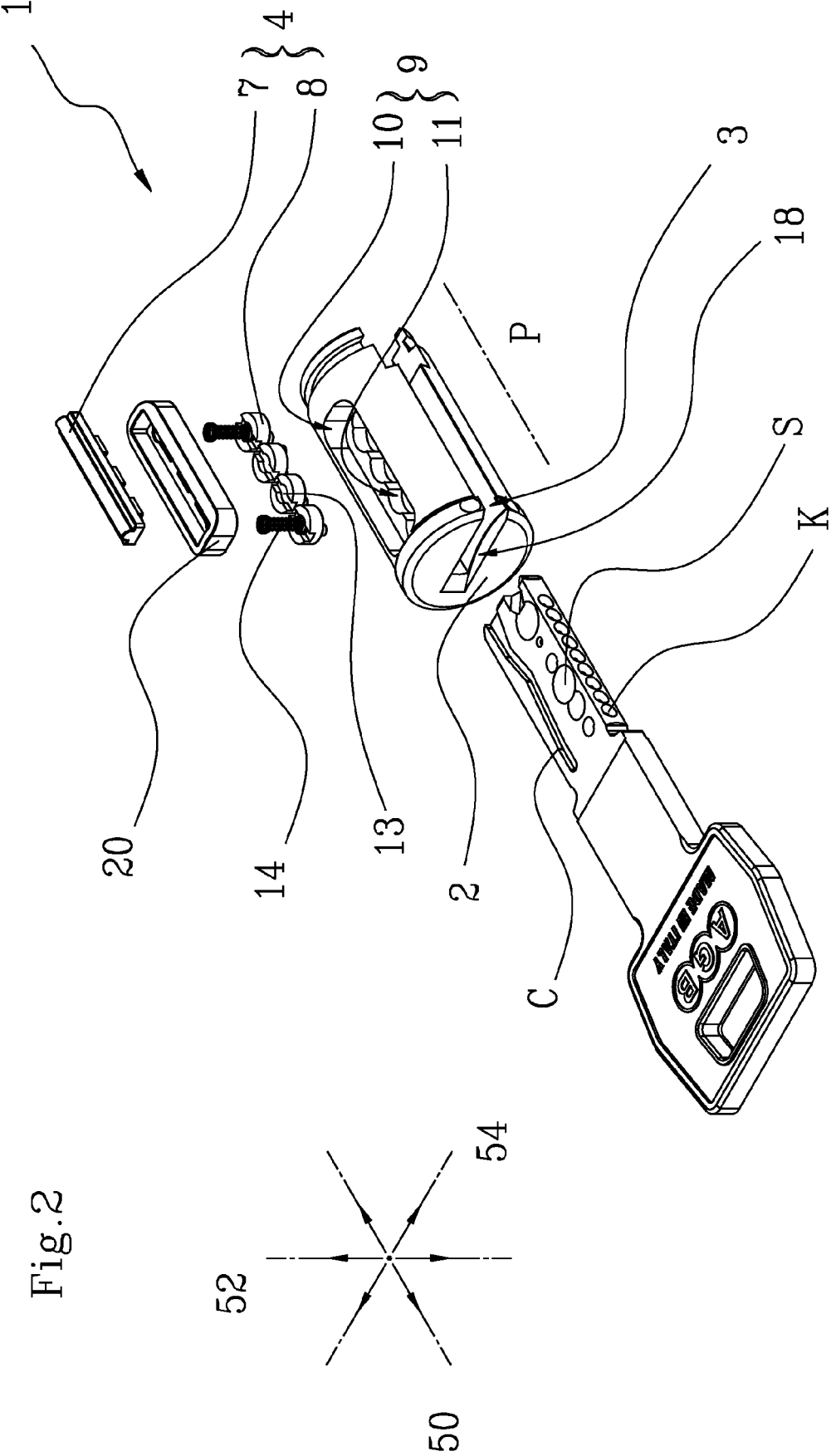
14. The method according to claim 12 or 13, comprising the further operating steps of:

- performing a fourth process along a first direction (53) inclined with respect to said operating direction (V) for obtaining a second series of compartments (16) for the insertion of each second security member (5);
- performing a fifth process along a second direction (54) inclined with respect to said operating direction (V) for obtaining a third series of compartments (17) for the insertion of each third security member (6);

characterised in that said first, second, third, fourth and fifth process can be performed according to any succession.

15. The method according to any claim from 12 to 14, comprising the further step of inserting each rotating element (8) into the respective compartment (11) so that the respective pin (15) is oriented in an outer position, wherein it is turned towards a mouth (18) of the seat (3) or in an inner position opposite said outer position with respect to the axis of rotation (51) of a respective rotating element (8).





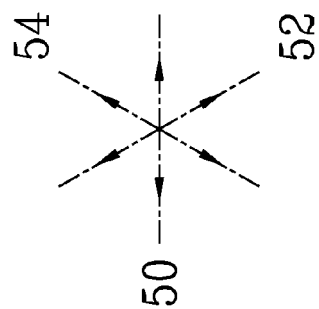
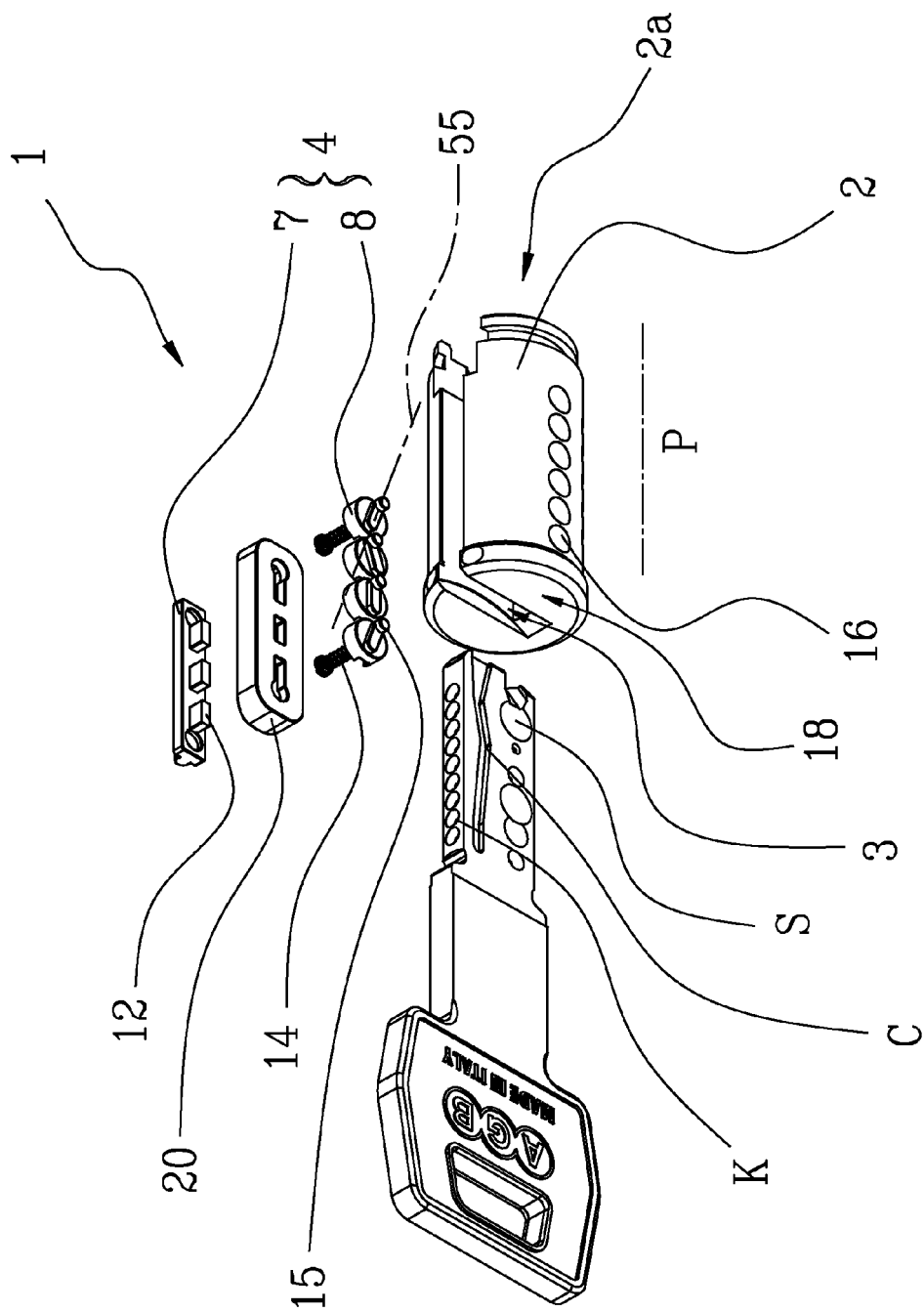
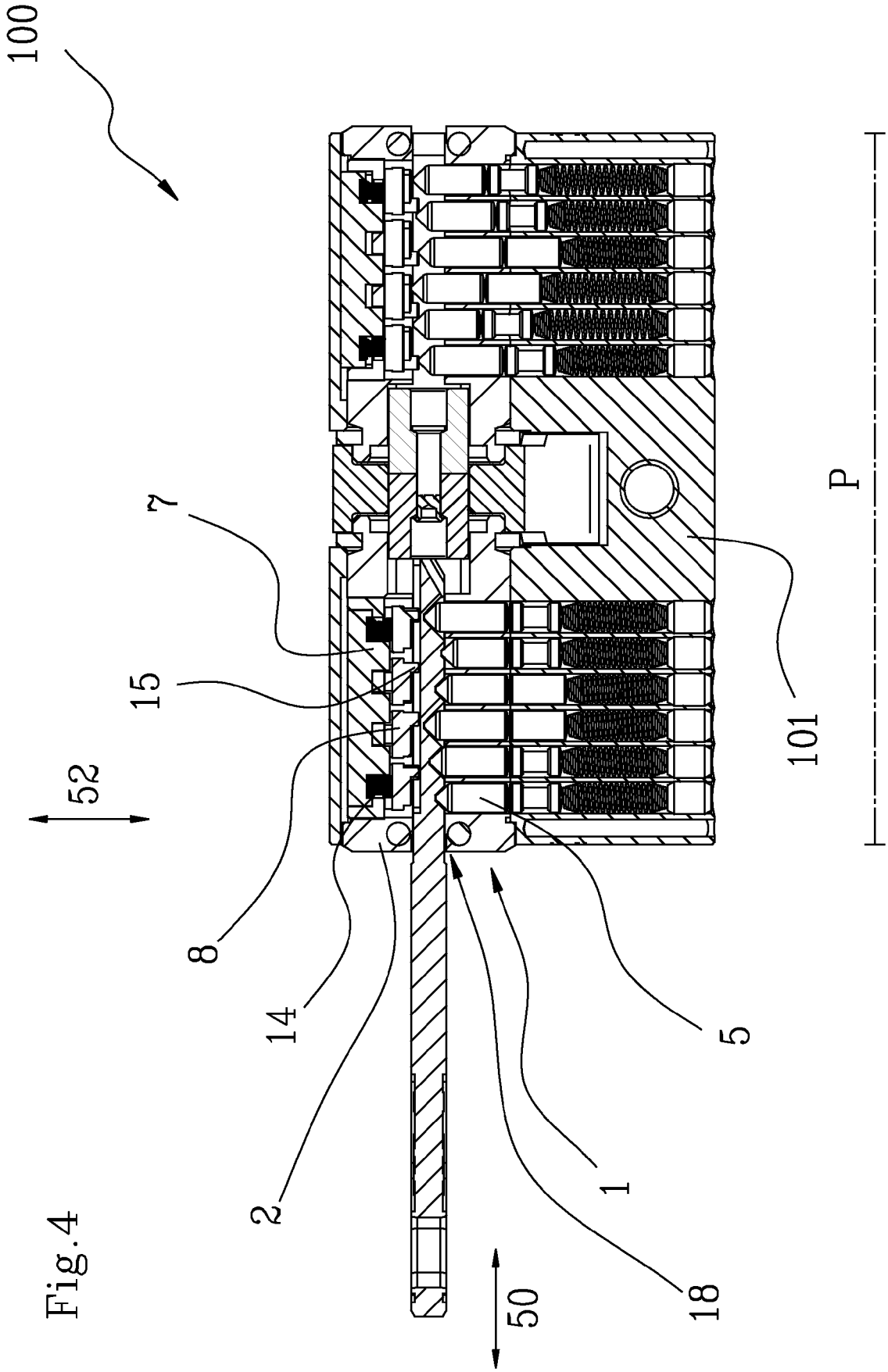
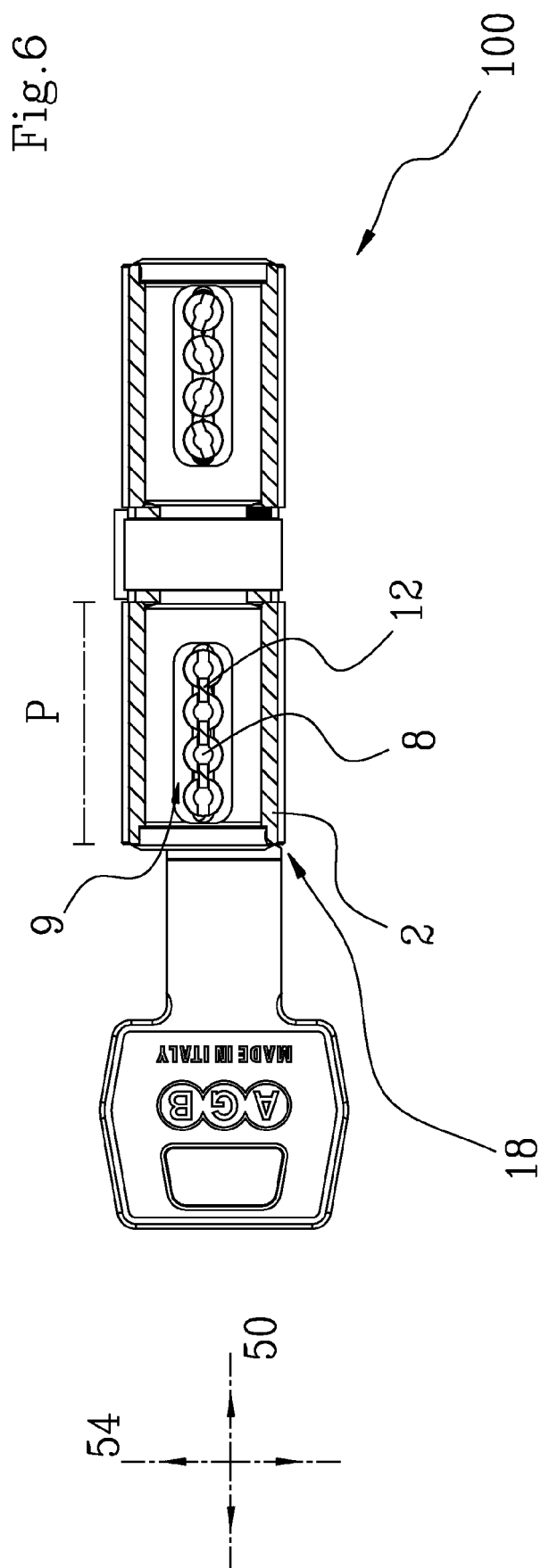
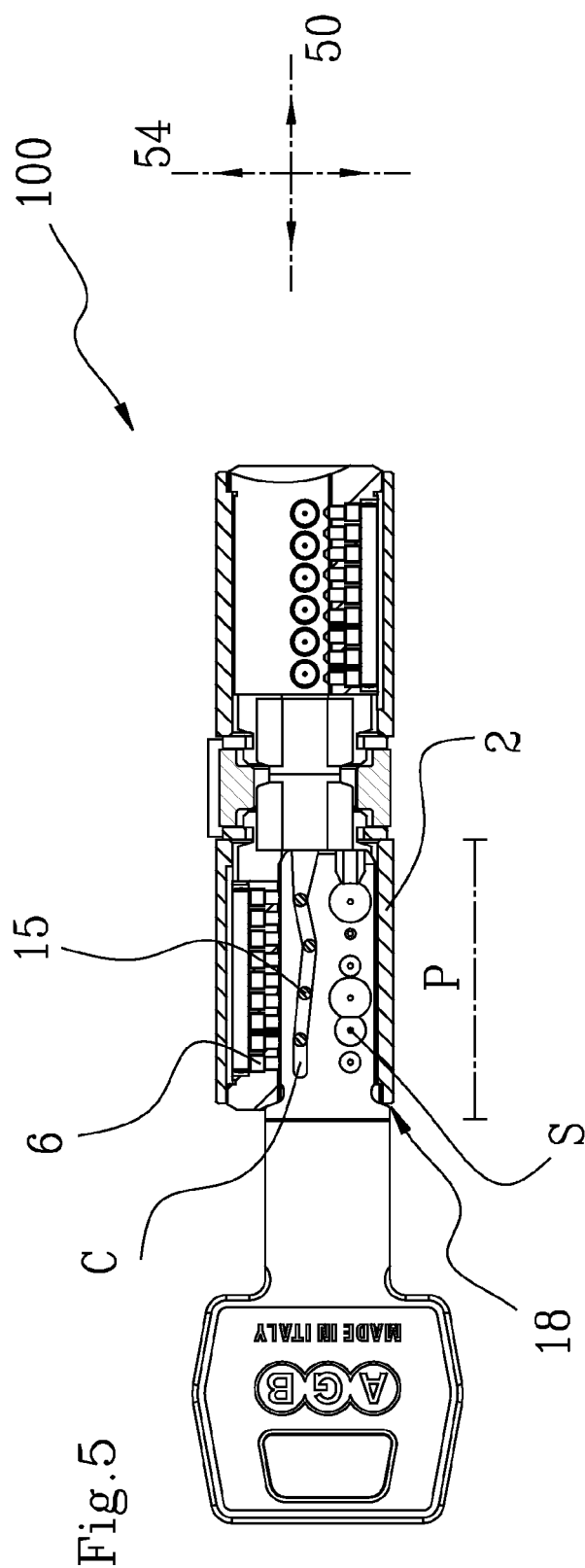


Fig. 3







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