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(54) **A LOCKING CORE HAVING DOUBLE PINS IN ONE HOLE**
VERSCHLUSSKERN MIT ZWEI STIFTEN IN EINEM LOCH
NOYAU DE VERROUILLAGE AYANT DES BROCHES DOUBLES DANS UN TROU

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Description

Technical field

[0001] The invention belongs to the technical field of lock cores, and in particular relates to a lock core having double pins in one hole.

Background

[0002] The existing lock core is provided with pin holes on the plug and the casing, and a pin mechanism is arranged in each pin hole, wherein generally a single-pin mechanism is provided in each pin hole. Increasing the number of matching points of the teeth of key is one of the ways to improve the anti-theft ability of the lock core. However, since the length of lock core needs to match the thickness of door panel, the length of lock core needs to be controlled within a certain range, thus the lengths of the casing and the plug are not suitable to be changed. When the length range is unchanged, it is not convenient to increase the matching points of the teeth of key. Therefore, multiple rows of teeth are designed to improve the anti-theft ability of the lock core.

[0003] For a lock core with multiple rows of teeth, multiple rows of pin mechanisms may be designed. The anti-theft capability is improved by increasing the number of the pin mechanisms and increasing the matching points between the pins and the teeth of key, that is, the technical solution disclosed in the patent application FR 2637644A1. However, this method is not convenient in the production and processing of the casing, plug and key, and is not convenient in the installation of the pin mechanisms. It requires high processing accuracy and the cost is high.

[0004] Patent applications EP 2 090 726 A2 and WO 2004/048724 A1 disclose lock cores with double pin mechanisms and WO 2007/085526 A1 and JP 2005 290909 A disclose that inner and outer pins are connected magnetically.

Summary

[0005] The present invention provides a locking core having double pins in one hole. The present invention designs a new type of pin mechanism having double pins, together with a oval-shaped pin hole, and thus achieves a locking core having double pins in one hole. A hole contains two pins which are staggered, and the two pins are aligned with two inner guide strips respectively. Meanwhile, a single-pin mechanism is provided, so that the single pin is aligned with the centerline (middle line) of the two inner guide strips. Besides, the length of the inner pin of double-pin mechanism may be different from each other. The matching points between the lock core and the key includes two rows as well as one point, which can greatly improve the anti-theft ability of the lock core.

[0006] The objective problem of the present invention

is solved by the following technical solution:

A lock core, comprising a casing and at least one plug, wherein the plug is provided with a keyway, the plug is provided with multiple inner pin holes, and the casing is provided with outer pin holes that match the inner pin holes, a pin mechanism is arranged inside an outer pin hole and corresponding inner pin hole; characterized in that a set of inner guide strips is provided on a wall of the keyway, wherein the set of inner guide strips comprises at least two inner guide strips; each inner pin hole penetrates both of the two inner guide strips and reaches the keyway; the multiple inner pin holes include a circular hole, and multiple oval holes or multiple rounded rectangular holes; the outer pin hole has the same cross section as the corresponding inner pin hole; the pin mechanism in the circular hole is a single-pin mechanism, where the pin has a circular cross section; the pin mechanism in the oval or rounded rectangular hole is a double-pin mechanism; the double-pin mechanism comprises a first cover that is fixedly installed in the outer pin hole, an outer pin set that is able to slide in the outer pin hole, and an inner pin set that is able to slide in the inner pin hole; the outer pin set comprises two outer pins which are able to slide against each other, a first spring is provided and fixed between the first cover and each outer pin, the inner pin set comprises two inner pins, which are able to slide against each other, a protrusion is provided on the bottom side of each inner pin; and under the same first cover, the protrusions of the two inner pins are aligned with the two inner guide strips respectively, the two inner pins are magnetically connected to the two outer pins respectively.

[0007] Optionally, for different double-pin mechanisms, the lengths of the inner pins are varying.

[0008] Optionally, on a vertical surface of each inner pin, a sliding groove and a sliding edge are provided, so that the two inner pins are able to slide through the sliding edge and the sliding groove.

[0009] Optionally, the single-pin mechanism includes a single inner pin, a single outer pin and a second cover; the second cover is fixedly installed in a circular hole in the casing, the single outer pin is able to slide in the circular hole in the casing, a second spring is provided and fixed between the single outer pin and the second cover, the single inner pin is able to slide in a circular hole in the plug, the single outer pin and the single inner pin are magnetically connected. Since the circular hole in the casing and/or pin has a circular cross section, the single outer pin and/or the single inner pin therein also preferred to have a circular cross section.

[0010] Optionally, the outer pin has a cross section of a half circle or a half ellipse; and the corresponding inner pin has an end surface, which is in contact with the outer pin and thus is also a half circle or a half ellipse.

[0011] Optionally, the present invention further comprises a key, the key includes a key body and a key handle; the key body is provided with a biting portion, and the biting portion includes a set of positioning

grooves, wherein the set of positioning grooves comprises at least two positioning grooves; each positioning groove is aligned with an inner guide strip; multiple sockets are provided on the positioning grooves, wherein each socket is matched with a protrusion of an inner pin; the sockets on two different positioning grooves are preferred to be staggered; a middle recess is located between two positioning grooves, wherein the middle recess is matched with the single inner pin.

[0012] Optionally, the bottom of the sliding edge extends to the bottom surface of the protrusion, and an arc end is provided at the bottom of the sliding edge and the bottom of the protrusion.

[0013] Optionally, the first spring and/or the second spring meet the following: each spring comprises a middle portion and two end portions, an elastic portion is provided between the middle portion and each end portion, the spacing of the middle portion as well as the spacing of the end portion is smaller than the spacing of elastic portion .

[0014] Optionally, the outer pin is provided with a notch, so that the bottom end of the first spring is fixedly installed in the notch.

[0015] Optionally, a slot is provided in the casing, for example in the middle of the casing or at one side of the casing, and a rotatable locking element is installed in the slot.

[0016] Optionally, the plug is provided with a transmission portion, the transmission portion is connected to the rotatable locking element.

[0017] Optionally, a through hole is provided in the casing, for example in the middle of the casing, and the through hole is a threaded hole.

[0018] Optionally, a groove for clip ring is provided on the plug and is located close to the rotatable locking element, and a clip ring is installed between the groove for clip ring and the casing.

[0019] Optionally, the present invention furthering comprises a set of outer guide strips; in the keyway, the set of outer guide strips and the set of inner guide strips are respectively arranged on two opposite inner walls, the set of inner guide strips and the set of outer guide strips are rotationally symmetrical around the centerline of the keyway.

[0020] Optionally, the same biting pattern is provided on both surfaces of the key body, so that the biting portion is rotationally symmetrical, and each positioning groove is aligned with an inner guide strip or an outer guide strip.

[0021] The present invention has the following beneficial effects:

1. The present invention designs a new type of pin mechanism having double pins, together with a oval-shaped pin hole, and thus achieves a locking core having double pins in one hole. A hole contains two pins which are staggered, and the two pins are aligned with two inner guide strips respectively. Meanwhile, a single-pin mechanism is provided,

so that the single pin is aligned with the centerline (middle line) of the two inner guide strips. Besides, the length of the inner pin of double-pin mechanism may be different from each other. The matching points between the lock core and the key includes two rows as well as one point, which can greatly improve the anti-theft ability of the lock core.

2. By the design of the double-pin mechanism, the number of pins in the same space can be improved. By improving the number of pins, the anti-theft ability of the lock core can be improved.

3. The present invention provides a key which has the same pattern on both sides, and thus can be used on both sides. The biting portion contains only concave grooves, without any protruding teeth, which can avoid damage to the key caused by bumping, thereby improving the service life of the key.

4. The pin holes on the casing and the plug(s) are arranged as a single row, which is simple in structure, and easy in production.

[0022] The implementation of the present invention will achieve at least one of the above advantages, and does not have to achieve all the above advantages at the same time.

Description of the drawings

[0023] In order to more clearly illustrate the technical solutions of the embodiments of the present invention, the following briefly introduces the drawings for describing the embodiments. Evidently, the drawings in the following description are only some embodiments of the invention. For those skilled persons in the art, other drawings can also be obtained based on these drawings without creative efforts.

Fig. 1 is a schematic structural diagram of a lock core having double pins in one hole, according to the present invention;

Fig. 2 is a structural diagram of the plug of lock;

Fig. 3 is a structural diagram of double-pin mechanism;

Fig. 4 is a structural diagram of an inner pin;

Fig. 5 is a structural diagram of a key;

Fig. 6 is a structural diagram of the first spring;

[0024] In the drawings, the parts represented by reference signs are listed as follows:

1 - casing, 2 - plug, 3 - single-pin mechanism, 4 - double-

pin mechanism, 5 - key, 6 - rotatable locking element, 7 - transmission portion, 8 - clip ring, 101 - outer pin hole, 102 - slot, 103-through hole, 201 - keyway, 202 - inner pin hole, 203 - outer guide strip, 204 - inner guide strip, 205 - circular hole, 206 - oval hole, 301 - single inner pin, 302 - single outer pin, 303 - second cover, 304 - second spring, 401 - first cover, 402 - outer pin, 403 - first spring, 404 - inner pin, 405 - sliding groove, 406 - sliding edge, 407 - protrusion, 408 - middle portion, 409 - end portion, 410 - elastic portion, 411 - notch, 501 - key body, 502 - key handle, 503 - positioning groove, 504 - socket, 505 - middle recess.

Detailed Embodiments

[0025] The technical solutions in the embodiments of the present invention will be clearly and completely described below, with reference to the accompanying drawings in the embodiments of the present invention. Evidently, the described embodiments are only part of the embodiments of the present invention, not all of them. Based on the embodiments described in the present invention, all the other embodiments obtained by those skilled persons without any creative efforts fall within the scope of protection of the present invention, the scope of the invention being defined by the appended claims.

[0026] Referring to Figures 1 to 4, the present invention is a lock core, comprising a casing 1 and at least one plug 1. The Fig. 1 shows a set of plugs 2 comprising two plugs 2. The plug 2 is provided with a keyway 201. The plug 2 is provided with a plurality of inner pin holes 202, and the casing 1 is provided with outer pin holes 101 that match the inner pin holes 202. A pin mechanism is arranged inside an outer pin hole 101 and corresponding inner pin hole 202.

[0027] In the keyway 201, a set of outer guide strips 203 and a set of inner guide strips 204 are respectively arranged on two opposite inner walls, i.e. the upper and lower inner walls. The set of inner guide strips 204 and the set of outer guide strips 203 are so shaped that they are centrosymmetric (around a center point).

[0028] The set of inner guide strips 204 and the set of outer guide strips 203 forms a pattern, which is rotationally symmetrical around the centerline (the middle line) of the keyway 201. In another word, the set of inner guide strips 204 and the set of outer guide strips 203 are central symmetrical relative to a center point of the keyway 201. The set of outer guide strips 203 contains at least two outer guide strips 203. The set of inner guide strips 204 contains at least two inner guide strips 204.

[0029] Each inner pin hole 202 is so located that the position of the inner pin hole 202 overlaps two of the inner guide strips 204. That is to say, each inner pin hole 202 runs across two inner guide strips 204. The inner pin holes 202 and the keyway 201 communicate. In another word, each inner pin hole 202 penetrates both of the two inner guide strips 204 and then reaches the keyway 201.

[0030] As shown in Figure 1, the set of plugs 2 has two

plugs 2. As shown in Figure 2, Each plug 2 is provided with multiple inner pin holes 202. The multiple inner pin holes 202 include a circular hole 205, and multiple oval holes 206 or multiple rounded rectangular holes 206. For example, the rounded rectangular hole 206 is a rectangular hole with two semicircles located at two opposite ends respectively. As an example, the hole 206 is bean-shaped, or has a shape like a kidney. The pin mechanism in the circular hole 205 is a single-pin mechanism 3, where the pin has a circular cross section. The pin mechanism in the oval or rounded rectangular hole 206 is a double-pin mechanism 4.

[0031] The shape of outer pin hole(s) 101 should correspond to the shape of the corresponding inner pin hole(s) 202. Thus, the outer pin hole (101) has the same cross section as the corresponding inner pin hole (202). That is to say, a group of outer pin holes 101 may also include a circular hole, and multiple oval holes or multiple rounded rectangular holes.

[0032] A double-pin mechanism 4 comprises a first cover 401 that is fixedly installed in the outer pin hole 101, an outer pin set that is able to slide in the outer pin hole 101, and an inner pin set that is able to slide in the inner pin hole 202.

[0033] The outer pin set comprises two outer pins 402 which are able to slide against each other. As an example, an outer pin 402 may have a cross section of a half circle, or a half ellipse, or a similar shape. A first spring 403 is provided and fixed between the first cover 401 and the outer pin 402. See the Figure 3.

[0034] The inner pin set comprises two inner pins 404, which are able to slide against each other. As an example, an inner pin may have a cross section of a half circle, or a half ellipse, or a similar shape.

[0035] As shown in the Figs. 3 and 4, on a vertical surface of each inner pin 404, a sliding groove 405 and a sliding edge 406 are provided, so that the two inner pins 404 are able to slide through the sliding edge 406 and the sliding groove 405. See Fig. 3, the sliding groove 405 of one inner pin matches (and engages with) the sliding edge 406 of the other inner pin, vice versa.

[0036] A protrusion 407 is provided on the bottom side of each inner pin 404. And the positions of the protrusions 407 of the two inner pins 404 are aligned with the two inner guide strips 204 respectively. The protrusions 407 of the two inner pins 407 contact each other (for example, along the sliding edge 406).

[0037] The two inner pins 404 are magnetically connected to the two outer pins 402 respectively.

[0038] Among the multiple double-pin mechanisms 4, the lengths of the inner pins are varying, the lengths of the outer pins are the same. The lengths of the first springs 403 are the same, and the lengths of the first covers 401 are the same. The "length" here means e.g. the length (height) along the vertical direction in Figures 1 and 3.

[0039] As shown in Fig. 1, the single-pin mechanism 3 includes a single inner pin 301, a single outer pin 302 and a second cover 303. The second cover 303 is fixedly

installed in a circular hole in the casing 1. The single outer pin 302 is able to slide in the circular hole in the casing 1. A second spring 304 is provided and fixed between the single outer pin 302 and the second cover 303. The single inner pin 301 is able to slide in a circular hole 205 in the plug 2. The single outer pin 302 and the single inner pin 301 are magnetically connected.

[0040] Since the circular hole in the casing (plug) has a circular cross section, the single outer pin 302 (the single inner pin 302) therein also preferred to have a circular cross section. Preferably, both ends of the single outer pin 302 are flat. Meanwhile, one end of the single inner pin 301 is flat, and the other end thereof has a pattern, for example, a protrusion (rounded protrusion). The pattern (rounded protrusion) is matched with the pattern on the key.

[0041] As shown in FIG. 5, the present invention may further comprise a key 5. The key 5 includes a key body 501 and a key handle 502. The two surfaces (upper and lower surfaces) of the key body 501 are provided with a biting portion which is rotationally symmetrical around the centerline (middle line) of the key body 501. In another word, the upper and lower surfaces are provided with a central symmetrical biting portion. The biting portion includes a set of positioning grooves 503. Each positioning groove 503 is aligned with an inner guide strip 204 or an outer guide strip 203. Besides, each positioning groove 503 fits an inner guide strip 204 or an outer guide strip 203. That is, the width (and the position) of the positioning groove 503 is matched with the width (and the position) of a corresponding inner guide strip 204 or a corresponding outer guide strip 203. Multiple sockets 504 are provided on the positioning grooves 503, wherein each socket 504 is matched with a protrusion 407. Multiple sockets 504 on two different positioning grooves 503 are preferred to be staggered. At least one middle recess 505 is located between two positioning grooves 503. A middle recess 505 is matched with the single inner pin 301.

[0042] As shown in the Figs. 3 to 4, the bottom of the sliding edge 406 extends to the bottom surface of the protrusion 407. Both the bottom of the sliding edge 406 and the bottom of the protrusion 407 are provided with an arc end, and the arc end is so designed as to facilitate the entering and exiting of the key 5. That is to say, the bottom of the inner pin 404 (which may includes the bottom of the sliding edge 406 and the bottom of the protrusion 407) is rounded to permit the key to slider over the pin easily.

[0043] As shown in Fig. 6, the first spring 403 comprises a middle portion 408 and two end portions 409, an elastic portion 410 is provided between the middle portion 408 and each end portion 409. The spacing (i.e. the distance of adjacent coils) of the middle portion 408 is smaller than the spacing of elastic portion 410. Also, the spacing of the end portion 409 is smaller than the spacing of elastic portion 410. The second spring 304 has the same or similar structure as the first spring 403.

[0044] As shown in Fig. 3, the outer pin 402 is provided

with a notch 411, so that the bottom end of the first spring 403 can be fixed/installed in the notch 411.

[0045] As shown in Fig. 1, a slot 102 is provided in the middle of the casing 1, and a rotatable locking element 6 is installed in the slot 102.

[0046] As shown in Fig. 1, on one side of each plug 2, which is facing the other plug 2, is provided with a transmission portion 7. The transmission portion 7 is connected to the rotatable locking element 6, and thus can drive the rotation of the rotatable locking element 6. The transmission portions 7 of two plugs 2 are connected by a rivet.

[0047] As shown in Fig. 1, a through hole 103 is provided in the middle of the casing 1, and the through hole 103 is a threaded hole.

[0048] As shown in Fig. 1, a groove for clip ring is provided on the plug 2 and close to the rotatable locking element 6, and a clip ring 8 is installed between the groove for clip ring and the casing 1.

[0049] The major axis (length direction) of the oval or rounded rectangular hole 206 is parallel to the axis direction of the lock plug 2 .

[0050] The working status of the lock core of the present invention is described as follows:

The key 5 is inserted into the keyway 201, so that the two positioning grooves 503 on one side of the key 5 are sliding along the two inner guide strips 204 in the lock core 2. The two positioning grooves 503 on the other side of the key 5 are sliding along the two outer guide strips in the lock core 2.

[0051] When a pattern in the biting (e.g. a convex slope, for example the convex slope formed between a socket 504 and a middle recess 505) comes into contact with the inner pin 404 (the protrusion 407 of the inner pin 404) or the single inner pin 301, the inner pin 404 or the single inner pin 301 will be lifted up, so that the corresponding first spring 403 or second spring 304 will be compressed.

[0052] The two protrusions 407 (of two inner pin 404) under the same first cover 401 should be matched with the patterns (e.g. sockets 504) on the two positioning grooves 503 respectively. The positions of the two protrusions 407 are preferred to be staggered. An example can be seen in Fig. 1 and Fig. 3, the two inner pin 404 are arranged one in front of the other, and the two corresponding protrusions 407 are located on the left and right respectively, and match the patterns (e.g. sockets 504) of the two positioning grooves 503 respectively. Preferably, each protrusion 407 is parallel to the axis direction of plug 2, i.e. parallel to the sliding (entering/exiting) direction of the key 5.

[0053] When the two protrusions 407 (of two inner pin 404) slide relative to each other, the sliding is guided by the sliding grooves 405 and the sliding edges 406.

[0054] When the biting of the key matches the patterns of the lock core (for example, all the protrusions 407 of the inner pin 404 match the sockets 504, and all the single inner pins 301 matches the middle recesses 505), the

interfaces (gaps) between the inner pins and the outer pins are aligned with the edge of the plug (aligned with the shear line), so that the plug can be rotated, and thus activate the unlocking or locking. For example, the rotation can be transmitted by the transmission portion 7 from the plug 2 to the rotatable locking element 6. Thus, the rotation of key 5 and plug 2 can drive the rotatable locking element 6 to rotate, so as to achieve unlocking or locking.

[0055] When the bitting of the key does not match the patterns of the lock core. For example, the protrusion 407 of an inner pin 404 (or the length of an inner pin 404) does not match the socket 504, the inner pin 404 (or the corresponding outer pin 402) will be located between the casing 1 and the plug 2, in another word, the pin is located both in the casing 1 and the plug 2 (that is, part of the pin is located in the casing 1 and the other part of the pin is located in the plug 2), which prevent the plug 2 from rotating. That is, due to the interference of the pin between the casing 1 and the plug 2, the plug cannot be rotated anymore.

[0056] In the description of the present invention, the terms like "one embodiment", "example", "specific example", etc. means that the specific features, structures, materials or characteristics described in the present invention or the embodiment is contained in at least one embodiment or example. In the present invention, the reference to the above schematic terms does not necessarily refer to the same embodiment or example. Besides, the specific features, structures, materials or characteristics described may be combined in a suitable manner in any one or more embodiments or examples.

[0057] The preferred embodiments of the present invention disclosed above are only intended to help elaborate the present invention. The preferred embodiment does not describe all the details, nor does it limit the invention to the specific embodiments described. Evidently, according to the content of this description, many modifications and changes may be made. The present invention selects and describes these embodiments, just to better explain the principles and practical applications of the present invention, so that those skilled in the art can well understand and use the present invention. The invention is limited only by the claims with their scope.

Claims

1. A lock core, comprising a casing (1) and at least one plug (2), wherein the plug (2) is provided with a keyway (201), the plug (2) is provided with multiple inner pin holes (202), and the casing (1) is provided with outer pin holes (101) that match the inner pin holes (202), a pin mechanism is arranged inside an outer pin hole (101) and corresponding inner pin hole (202);

wherein the lock core further comprises
a set of inner guide strips (204) is provided on a

wall of the keyway (201), wherein the set of inner guide strips (204) comprises at least two inner guide strips (204);

each inner pin hole (202) penetrates both of the two inner guide strips (204) and reaches the keyway (201);

the multiple inner pin holes (202) include a circular hole (205), and multiple oval holes (206) or multiple rounded rectangular holes (206); the pin mechanism in the circular hole (205) is a single-pin mechanism (3), where the pin has a circular cross section; the pin mechanism in the oval or rounded rectangular hole (206) is a double-pin mechanism (4);

the double-pin mechanism (4) comprises a first cover (401) that is fixedly installed in the outer pin hole (101), an outer pin set that is able to slide in the outer pin hole (101), and an inner pin set that is able to slide in the inner pin hole (202); the outer pin set comprises two outer pins (402) which are able to slide against each other, a first spring (403) is provided and fixed between the first cover (401) and each outer pin (402), the inner pin set comprises two inner pins (404), which are able to slide against each other, a protrusion (407) is provided on the bottom side of each inner pin (404), and under the same first cover (401), the protrusions (407) of the two inner pins (404) are aligned with the two inner guide strips (204) respectively, the two inner pins (404) are magnetically connected to the two outer pins (402) respectively.

2. The lock core according to claim 1, wherein for different double-pin mechanisms (4), the lengths of the inner pins are varying.
3. The lock core according to claim 1, wherein, on an vertical surface of each inner pin (404), a sliding groove (405) and a sliding edge (406) are provided, so that the two inner pins (404) are able to slide through the sliding edge (406) and the sliding groove (405).
4. The lock core according to any preceding claim, wherein the single-pin mechanism (3) includes a single inner pin (301), a single outer pin (302) and a second cover (303); the second cover (303) is fixedly installed in a circular hole in the casing (1), the single outer pin (302) is able to slide in the circular hole in the casing (1), a second spring (304) is provided and fixed between the single outer pin (302) and the second cover (303), the single inner pin (301) is able to slide in a circular hole (205) in the plug (2), the single outer pin (302) and the single inner pin (301) are magnetically connected.
5. The lock core according to any preceding claim,

wherein the outer pin (402) has a cross section of a half circle or a half ellipse; and the corresponding inner pin (404) has an end surface, which is in contact with the outer pin (402) and thus is also a half circle or a half ellipse.

6. The lock core according to any preceding claim, further comprising a key (5), the key (5) includes a key body (501) and a key handle (502);

the key body (501) is provided with a biting portion, and the biting portion includes a set of positioning grooves (503), wherein the set of positioning grooves (503) comprises at least two positioning grooves (503); each positioning groove (503) is to be aligned with an inner guide strip (204);

multiple sockets (504) are provided on the positioning grooves (503), wherein each socket (504) is matched with a protrusion (407) of an inner pin (404); the sockets (504) on two different positioning grooves (503) are preferred to be staggered;

a middle recess (505) is located between two positioning grooves (503), wherein the middle recess (505) is matched with the single inner pin (301).

7. The lock core according to any preceding claim, wherein the bottom of the sliding edge (406) extends to the bottom surface of the protrusion (407), and an arc end is provided at the bottom of the sliding edge (406) and the bottom of the protrusion (407).

8. The lock core according to any preceding claim, wherein the first spring (403) and/or the second spring (304) meet the following: each spring comprises a middle portion (408) and two end portions (409), an elastic portion (410) is provided between the middle portion (408) and each end portion (409), the spacing of the middle portion (408) as well as the spacing of the end portion (409) is smaller than the spacing of elastic portion (410).

9. The lock core according to any preceding claim, wherein the outer pin (402) is provided with a notch (411), so that the bottom end of the first spring (403) is fixedly installed in the notch (411).

10. The lock core according to any preceding claim, wherein a slot (102) is provided in the casing (1), for example in the middle of the casing (1) or at one side of the casing (1), and a rotatable locking element (6) is installed in the slot (102).

11. The lock core according to claim 10, wherein the plug (2) is provided with a transmission portion (7), the transmission portion (7) is connected to the rotatable

locking element (6).

12. The lock core according to any preceding claim, wherein a through hole (103) is provided in the casing (1), for example in the middle of the casing (1), and the through hole (103) is a threaded hole.

13. The lock core according to claim 10 or 11, wherein a groove for clip ring is provided on the plug (2) and is located close to the rotatable locking element (6), and a clip ring (8) is installed between the groove for clip ring and the casing (1).

14. The lock core according to any preceding claim, further comprising a set of outer guide strips (203); in the keyway (201), the set of outer guide strips (203) and the set of inner guide strips (204) are respectively arranged on two opposite inner walls, the set of inner guide strips (204) and the set of outer guide strips (203) are rotationally symmetrical around the centerline of the keyway (201).

15. The lock core according to claim 14 citing claim 6, wherein the same biting pattern is provided on both surfaces of the key body (501), so that the biting portion is rotationally symmetrical, and each positioning groove (503) of the key (5) is to be aligned with an inner guide strip (204) or an outer guide strip (203) in the keyway (201).

Patentansprüche

1. Schlosskern, umfassend ein Gehäuse (1) und mindestens einen Stopfen (2), wobei der Stopfen (2) mit einem Schlüsselschlitz (201) versehen ist, der Stopfen (2) mit mehreren inneren Stiftlöchern (202) versehen ist und das Gehäuse (1) mit äußeren Stiftlöchern (101) versehen ist, die zu den inneren Stiftlöchern (202) passen, ein Stiftmechanismus innerhalb eines äußeren Stiftlochs (101) und eines entsprechenden inneren Stiftlochs (202) angeordnet ist; wobei der Schlosskern ferner Folgendes umfasst:

ein Satz innerer Führungsleisten (204) ist an einer Wand des Schlüsselschlitzes (201) bereitgestellt, wobei der Satz innerer Führungsleisten (204) mindestens zwei innere Führungsleisten (204) umfasst;

jedes innere Stiftloch (202) durchdringt beide der zwei inneren Führungsleisten (204) und reicht bis zu dem Schlüsselschlitz (201);

die mehreren inneren Stiftlöcher (202) enthalten ein kreisförmiges Loch (205) und mehrere ovale Löcher (206) oder mehrere abgerundete rechteckige Löcher (206); der Stiftmechanismus in dem kreisförmigen Loch (205) ist ein Einstiftmechanismus (3), wobei der Stift einen kreisförmigen

- gen Querschnitt aufweist; der Stiftmechanismus in dem ovalen oder abgerundeten rechteckigen Loch (206) ist ein Doppelstiftmechanismus (4); der Doppelstiftmechanismus (4) umfasst eine erste Abdeckung (401), die fest in dem äußeren Stiftloch (101) installiert ist, einen äußeren Stiftsatz, der in der Lage ist, in dem äußeren Stiftloch (101) zu gleiten, und einen inneren Stiftsatz, der in der Lage ist, in dem inneren Stiftloch (202) zu gleiten;
- der äußere Stiftsatz umfasst zwei äußere Stifte (402), die in der Lage sind, gegeneinander zu gleiten, eine erste Feder (403) ist bereitgestellt und zwischen der ersten Abdeckung (401) und jedem äußeren Stift (402) befestigt,
- der innere Stiftsatz umfasst zwei innere Stifte (404), die in der Lage sind, gegeneinander zu gleiten,
- ein Vorsprung (407) ist an der unteren Seite jedes inneren Stifts (404) bereitgestellt und unter der gleichen ersten Abdeckung (401) sind die Vorsprünge (407) der zwei inneren Stifte (404) jeweils auf die zwei inneren Führungsleisten (204) ausgerichtet, wobei die zwei inneren Stifte (404) jeweils magnetisch mit den zwei äußeren Stiften (402) verbunden sind.
2. Schlosskern nach Anspruch 1, wobei für verschiedene Doppelstiftmechanismen (4) die Längen der inneren Stifte variieren.
3. Schlosskern nach Anspruch 1, wobei an einer vertikalen Oberfläche jedes inneren Stifts (404) eine Gleitnut (405) und eine Gleitkante (406) bereitgestellt sind, sodass die zwei inneren Stifte (404) in der Lage sind, durch die Gleitkante (406) und die Gleitnut (405) zu gleiten.
4. Schlosskern nach einem vorhergehenden Anspruch, wobei der Einstiftmechanismus (3) einen einzelnen inneren Stift (301), einen einzelnen äußeren Stift (302) und eine zweite Abdeckung (303) enthält; die zweite Abdeckung (303) fest in einem kreisförmigen Loch in dem Gehäuse (1) installiert ist, der einzelne äußere Stift (302) in der Lage ist, in dem kreisförmigen Loch in dem Gehäuse (1) zu gleiten, eine zweite Feder (304) bereitgestellt und zwischen dem einzelnen äußeren Stift (302) und der zweiten Abdeckung (303) befestigt ist, der einzelne innere Stift (301) in der Lage ist, in einem kreisförmigen Loch (205) in dem Stopfen (2) zu gleiten, der einzelne äußere Stift (302) und der einzelne innere Stift (301) magnetisch verbunden sind.
5. Schlosskern nach einem vorhergehenden Anspruch, wobei der äußere Stift (402) einen Querschnitt eines Halbkreises oder einer halben Ellipse aufweist; und der entsprechende innere Stift (404)
- eine Endoberfläche aufweist, die in Kontakt mit dem äußeren Stift (402) ist und somit auch ein Halbkreis oder eine halbe Ellipse ist.
6. Schlosskern nach einem vorhergehenden Anspruch, ferner umfassend einen Schlüssel (5), wobei der Schlüssel (5) einen Schlüsselkörper (501) und einen Schlüsselgriff (502) enthält;
- der Schlüsselkörper (501) mit einem Bartabschnitt versehen ist und der Bartabschnitt einen Satz Positionierungsnuten (503) enthält, wobei der Satz Positionierungsnuten (503) mindestens zwei Positionierungsnuten (503) umfasst; jede Positionierungsnut (503) auf eine innere Führungsleiste (204) auszurichten ist; mehrere Vertiefungen (504) an den Positionierungsnuten (503) bereitgestellt sind, wobei jede Vertiefung (504) auf einen Vorsprung (407) eines inneren Stifts (404) abgestimmt ist; die Vertiefungen (504) an zwei verschiedenen Positionierungsnuten (503) bevorzugt versetzt sind; eine mittlere Aussparung (505) sich zwischen zwei Positionierungsnuten (503) befindet, wobei die mittlere Aussparung (505) auf den einzelnen inneren Stift (301) abgestimmt ist.
7. Schlosskern nach einem vorhergehenden Anspruch, wobei sich der Unterteil der Gleitkante (406) zu der unteren Oberfläche des Vorsprungs (407) erstreckt und ein Bogenende an dem Unterteil der Gleitkante (406) und dem Unterteil des Vorsprungs (407) bereitgestellt ist.
8. Schlosskern nach einem vorhergehenden Anspruch, wobei die erste Feder (403) und/oder die zweite Feder (304) Folgendes erfüllen: jede Feder umfasst einen mittleren Abschnitt (408) und zwei Endabschnitte (409), ein elastischer Abschnitt (410) ist zwischen dem mittleren Abschnitt (408) und jedem Endabschnitt (409) bereitgestellt, die Teilung des mittleren Abschnitts (408) sowie die Teilung des Endabschnitts (409) ist kleiner als die Teilung des elastischen Abschnitts (410).
9. Schlosskern nach einem vorhergehenden Anspruch, wobei der äußere Stift (402) mit einer Einkerbung (411) versehen ist, sodass das untere Ende der ersten Feder (403) fest in der Einkerbung (411) installiert ist.
10. Schlosskern nach einem vorhergehenden Anspruch, wobei ein Schlitz (102) in dem Gehäuse (1) bereitgestellt ist, beispielsweise in der Mitte des Gehäuses (1) oder an einer Seite des Gehäuses (1), und ein drehbares Verriegelungselement (6) in dem Schlitz (102) installiert ist.

11. Schlosskern nach Anspruch 10, wobei der Stopfen (2) mit einem Übertragungsabschnitt (7) versehen ist, wobei der Übertragungsabschnitt (7) mit dem drehbaren Verriegelungselement (6) verbunden ist. 5
12. Schlosskern nach einem vorhergehenden Anspruch, wobei ein Durchgangsloch (103) in dem Gehäuse (1) bereitgestellt ist, beispielsweise in der Mitte des Gehäuses (1), und das Durchgangsloch (103) ein Gewindeloch ist. 10
13. Schlosskern nach Anspruch 10 oder 11, wobei eine Nut für einen Clipring an dem Stopfen (2) bereitgestellt ist und sich in der Nähe des drehbaren Verriegelungselements (6) befindet, und ein Clipring (8) zwischen der Nut für den Clipring und dem Gehäuse (1) installiert ist. 15
14. Schlosskern nach einem vorhergehenden Anspruch, ferner umfassend einen Satz äußerer Führungsleisten (203); wobei in dem Schlüsselschlitz (201) der Satz äußerer Führungsleisten (203) und der Satz innerer Führungsleisten (204) jeweils an zwei gegenüberliegenden Innenwänden angeordnet sind, der Satz innerer Führungsleisten (204) und der Satz äußerer Führungsleisten (203) rotationssymmetrisch um die Mittellinie des Schlüsselschlitzes (201) sind. 20 25
15. Schlosskern nach Anspruch 14 unter Berufung auf Anspruch 6, wobei auf beiden Oberflächen des Schlüsselkörpers (501) das gleiche Bartmuster bereitgestellt ist, sodass der Bartabschnitt rotationssymmetrisch ist, und jede Positionierungsnut (503) des Schlüssels (5) auf eine innere Führungsleiste (204) oder eine äußere Führungsleiste (203) in dem Schlüsselschlitz (201) auszurichten ist. 30 35

Revendications

1. Noyau de verrou, comprenant un boîtier (1) et au moins un bouchon (2), dans lequel le bouchon (2) est pourvu d'une rainure de clavette (201), le bouchon (2) est pourvu de multiples trous de broche internes (202), et le boîtier (1) est pourvu de trous de broche externes (101) qui correspondent aux trous de broche internes (202), un mécanisme de broche est agencé à l'intérieur d'un trou de broche externe (101) et d'un trou de broche interne correspondant (202); 50
- dans lequel le noyau de verrou comprend en outre un ensemble de bandes de guidage internes (204) est prévu sur une paroi de la rainure de clavette (201), dans lequel l'ensemble de bandes de guidage internes (204) comprend au 55

moins deux bandes de guidage internes (204); chaque trou de broche interne (202) pénètre dans les deux bandes de guidage internes (204) et atteint la rainure de clavette (201); les multiples trous de broche internes (202) comprennent un trou circulaire (205), et de multiples trous ovales (206) ou de multiples trous rectangulaires arrondis (206); le mécanisme de broche dans le trou circulaire (205) est un mécanisme à broche unique (3), où la broche comporte une section transversale circulaire; le mécanisme de broche dans le trou rectangulaire ovale ou arrondi (206) est un mécanisme à broches doubles (4); le mécanisme à broches doubles (4) comprend un premier couvercle (401) qui est installé de manière fixe dans le trou de broche externe (101), un ensemble de broche externe qui est capable de coulisser dans le trou de broche externe (101), et un ensemble de broche interne qui est capable de coulisser dans le trou de broche interne (202); l'ensemble de broche externe comprend deux broches externes (402) qui peuvent coulisser l'une contre l'autre, un premier ressort (403) est prévu et fixé entre le premier couvercle (401) et chaque broche externe (402), l'ensemble de broche interne comprend deux broches internes (404), qui sont capables de glisser l'une contre l'autre, une saillie (407) est prévue sur le côté inférieur de chaque broche internes (404), et sous le même premier couvercle (401), les saillies (407) des deux broches internes (404) sont alignées avec les deux bandes de guidage internes (204) respectivement, les deux broches internes (404) sont reliées magnétiquement aux deux broches externes (402) respectivement.

2. Noyau de verrou selon la revendication 1, dans lequel pour différents mécanismes à broches doubles (4), les longueurs des broches internes varient. 40
3. Noyau de verrou selon la revendication 1, dans lequel, sur une surface verticale de chaque broche interne (404), une rainure de coulissement (405) et un bord de coulissement (406) sont prévus, de sorte que les deux broches internes (404) sont capables de coulisser à travers le bord de coulissement (406) et la rainure de coulissement (405). 45
4. Noyau de verrou selon une quelconque revendication précédente, dans lequel le mécanisme à broche unique (3) comprend une broche interne unique (301), une broche externe unique (302) et un second couvercle (303); le second couvercle (303) est installé de manière fixe dans un trou circulaire dans le boîtier (1), la broche externe unique (302) est ca-

pable de coulisser dans le trou circulaire dans le boîtier (1), un second ressort (304) est prévu et fixé entre la broche externe unique (302) et le second couvercle (303), la broche interne unique (301) est capable de coulisser dans un trou circulaire (205) dans le bouchon (2), la broche externe unique (302) et la broche interne unique (301) sont reliées magnétiquement.

5. Noyau de verrou selon une quelconque revendication précédente, dans lequel la broche externe (402) comporte une section transversale de demi-cercle ou de demi-ellipse ; et la broche interne correspondante (404) comporte une surface d'extrémité, qui est en contact avec la broche externe (402) et est donc également un demi-cercle ou une demi-ellipse.
6. Noyau de verrou selon une quelconque revendication précédente, comprenant en outre une clé (5), la clé (5) comprend un corps de clé (501) et une poignée de clé (502) ;

le corps de clé (501) est pourvu d'une partie de morsure, et la partie de morsure comprend un ensemble de rainures de positionnement (503), dans lequel l'ensemble de rainures de positionnement (503) comprend au moins deux rainures de positionnement (503) ; chaque rainure de positionnement (503) doit être alignée avec une bande de guidage interne (204) ; de multiples douilles (504) sont prévues sur les rainures de positionnement (503), dans lequel chaque douille (504) est en correspondance avec une saillie (407) d'une broche interne (404) ; les douilles (504) sur deux rainures de positionnement différentes (503) sont de préférence décalées ; un évidement médian (505) est situé entre deux rainures de positionnement (503), dans lequel l'évidement médian (505) est en correspondance avec la broche interne unique (301).

7. Noyau de verrou selon une quelconque revendication précédente, dans lequel le bas du bord de coulissement (406) s'étend vers la surface inférieure de la saillie (407), et une extrémité d'arc est prévue au niveau du bas du bord de coulissement (406) et du bas de la saillie (407).
8. Noyau de verrou selon une quelconque revendication précédente, dans lequel le premier ressort (403) et/ou le second ressort (304) répondent aux caractéristiques suivantes : chaque ressort comprend une partie médiane (408) et deux parties d'extrémité (409), une partie élastique (410) est prévue entre la partie médiane (408) et chaque partie d'extrémité (409), l'espacement de la partie médiane (408) ainsi que l'espacement de la partie d'extrémité (409) est

inférieur à l'espacement de la partie élastique (410).

9. Noyau de verrou selon une quelconque revendication précédente, dans lequel la broche externe (402) est pourvue d'une encoche (411), de sorte que l'extrémité inférieure du premier ressort (403) est installée de manière fixe dans l'encoche (411).
10. Noyau de verrou selon une quelconque revendication précédente, dans lequel une fente (102) est prévue dans le boîtier (1), par exemple au milieu du boîtier (1) ou au niveau d'un côté du boîtier (1), et un élément de verrouillage rotatif (6) est installé dans la fente (102).
11. Noyau de verrou selon la revendication 10, dans lequel le bouchon (2) est pourvu d'une partie de transmission (7), la partie de transmission (7) est reliée à l'élément de verrouillage rotatif (6).
12. Noyau de verrou selon une quelconque revendication précédente, dans lequel un trou traversant (103) est prévu dans le boîtier (1), par exemple au milieu du boîtier (1), et le trou traversant (103) est un trou fileté.
13. Noyau de verrou selon la revendication 10 ou 11, dans lequel une rainure pour anneau d'attache est prévue sur le bouchon (2) et est située à proximité de l'élément de verrouillage rotatif (6), et un anneau d'attache (8) est installé entre la rainure pour anneau d'attache et le boîtier (1).
14. Noyau de serrure selon une quelconque revendication précédente, comprenant en outre un ensemble de bandes de guidage externes (203) ; dans la rainure de clavette (201), l'ensemble de bandes de guidage externes (203) et l'ensemble de bandes de guidage internes (204) sont respectivement agencés sur deux parois internes opposées, l'ensemble de bandes de guidage internes (204) et l'ensemble de bandes de guidage externes (203) sont symétriques en rotation autour de l'axe central de la rainure de clavette (201).
15. Noyau de verrou selon la revendication 14, citant la revendication 6, dans lequel le même motif de morsure est prévu sur les deux surfaces du corps de clé (501), de sorte que la partie de morsure est symétrique en rotation, et chaque rainure de positionnement (503) de la clé (5) doit être alignée avec une bande de guidage interne (204) ou une bande de guidage externe (203) dans la rainure de clavette (201).

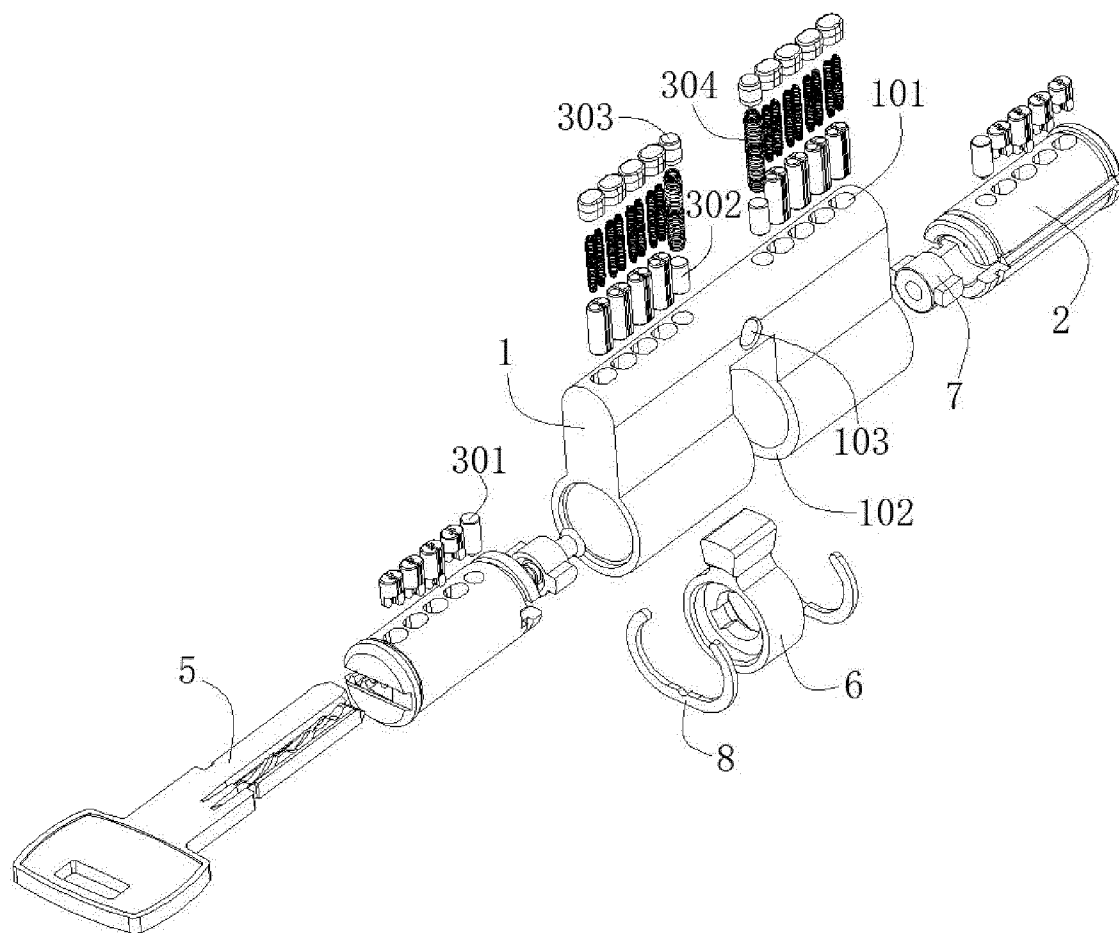


Fig. 1

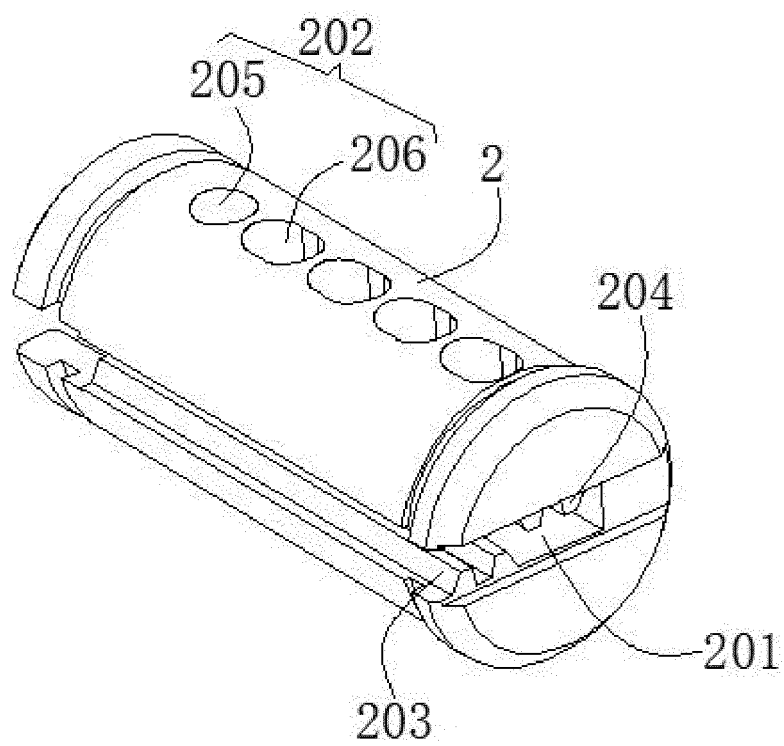


Fig. 2

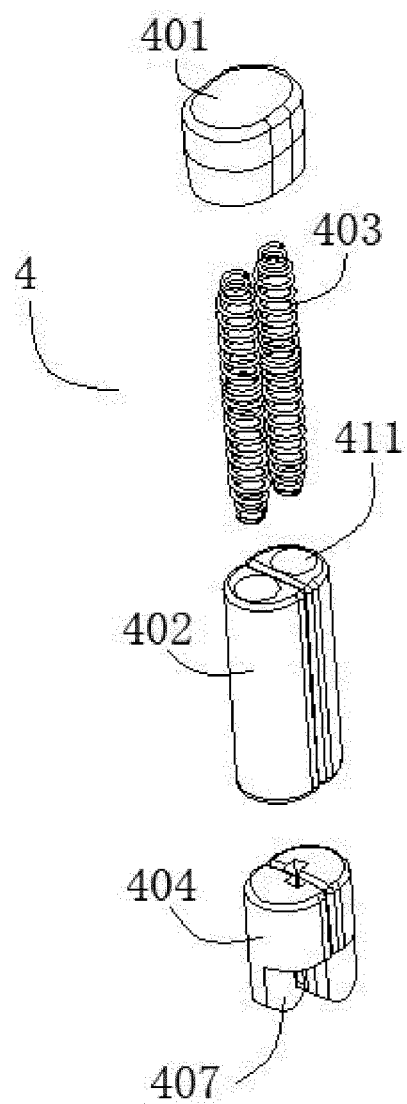


Fig. 3

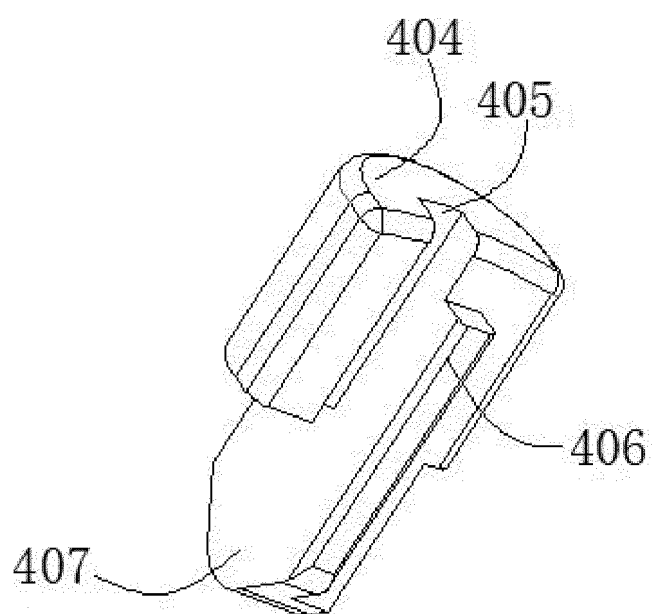


Fig. 4

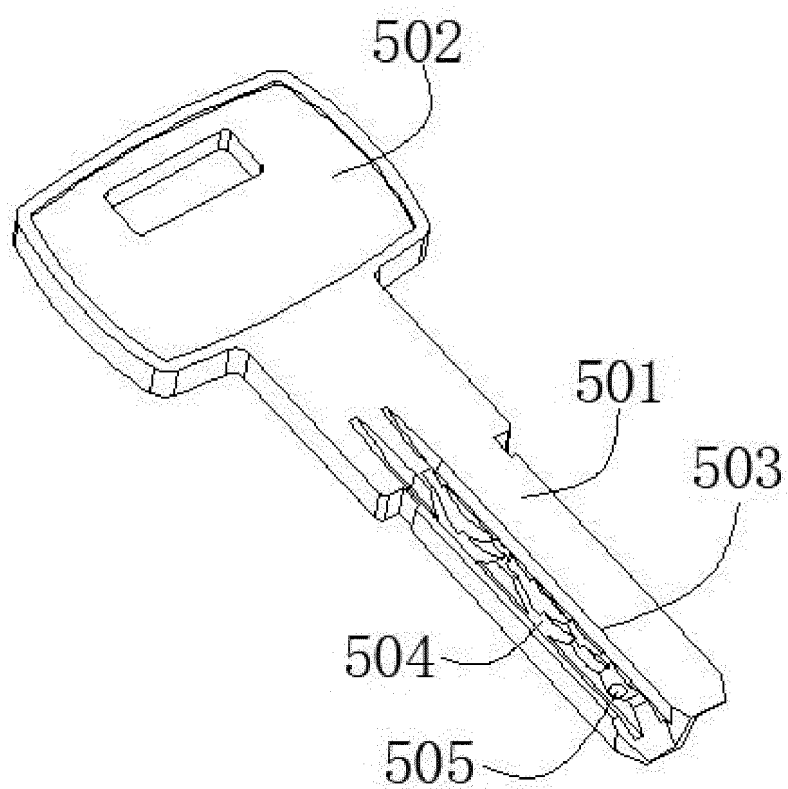


Fig. 5

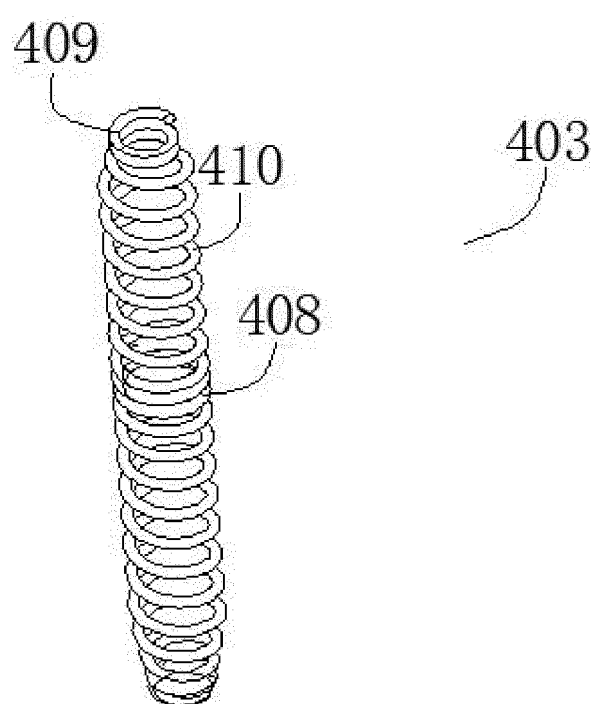


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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