



(11) **EP 2 585 660 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
18.07.2018 Bulletin 2018/29

(51) Int Cl.:
E05B 9/04 ^(2006.01) **E05B 9/08** ^(2006.01)
E05B 17/20 ^(2006.01)

(21) Application number: **11798481.5**

(86) International application number:
PCT/SE2011/050832

(22) Date of filing: **23.06.2011**

(87) International publication number:
WO 2011/162712 (29.12.2011 Gazette 2011/52)

(54) **LOCK AND LOCK DEVICE COMPRISES A CYLINDER, CYLINDER PLUG AND A SECURING MEMBER**

SCHLOSS UND SCHLIESSVORRICHTUNG MIT EINEM ZYLINDER, EINEM ZYLINDERSTECKER UND EINEM BEFESTIGUNGSELEMENT

SERRURE ET DISPOSITIF DE VERROUILLAGE COMPORTANT UN CYLINDRE DE SERRURE, UN BOUCHON DE CYLINDRE ET UN ÉLÉMENT D'ASSUJETTISSEMENT

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

(30) Priority: **24.06.2010 SE 1050693**

(43) Date of publication of application:
01.05.2013 Bulletin 2013/18

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(56) References cited:
EP-A1- 2 126 259 US-A- 4 711 106
US-A1- 2003 089 148 US-A1- 2006 021 406
US-B1- 6 314 774

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Description

Technical field

[0001] The present invention relates generally to locks and in particular to a lock device comprising a cylinder house and a cylinder plug arranged in the cylinder house.

Background

[0002] Locks of the abovementioned type are manoeuvred by means of a matching key, which can be inserted into a key way arranged in the cylinder plug. The key's action on the pins arranged in the cylinder plug and in the cylinder house releases the cylinder plug and allows the cylinder plug to be turned relative to the cylinder house.

[0003] The cylinder house is usually mounted for use in a lock case. The lock case typically comprises a lock mechanism which, via mechanical coupling between the lock mechanism and the cylinder plug, permits manoeuvring of a dead bolt arranged in the lock case when the cylinder plug is turned.

[0004] In order to fix the cylinder plug in the cylinder house, a securing member is generally arranged at the end of the cylinder plug protruding from the cylinder house. Examples of such securing members are, for instance, a circlip received in a peripheral groove in said protruding end.

[0005] A disadvantage of the above solution is, for example, that when an attempt is made to remove the cylinder plug mounted in the cylinder house by exerting force in the axial direction, the securing member may be radially deformed by expansion of its opening that surrounds the cylinder plug. In this way, the cylinder plug can be released from the cylinder house. US 4 711 106 A discloses a locking device which may be used in locking two objects together, and includes a stud having a threaded axial hole extending rearwardly from the forward end thereof and a keyed portion having at least one key, and a knob which locks over a forward portion of the stud and includes a casing with an inner surface including at least one keyway each of which receives the corresponding key on the stud to prevent rotation of the casing with respect to the stud. The knob also includes a tumbler housing which is mounted in an axially fixed position within the casing to rotate freely when a key is inserted into the tumbler housing, and to remain locked in a fixed position when the key is withdrawn. Connected to a rear end of the tumbler housing is a threaded stud which engages the threaded axial hole of the stud when the tumbler housing is turned by a key to thereby pull a forward portion of the stud into the casing hole.

Summary

[0006] A first object of the present invention is to make available a lock device that improves security against

manipulation of the lock device.

[0007] Another object of the present invention is to make available a lock device that permits the use of a more reliable type of cylinder plug without structurally changing the cylinder house.

[0008] The present invention is based on the recognition by the inventor that, instead of arranging a securing member on an end protruding from the cylinder house, the securing member can be at least partially arranged on the cylinder plug inside the cylinder house when the cylinder plug is in the mounted position. The interior of the cylinder house thus counteracts expansion of the securing member when a strong axial force is applied to the cylinder plug, which can occur, for example, during manipulation aimed at removing the cylinder plug from the cylinder house.

[0009] Moreover, the inventor has also recognized that, by providing the rear end of the securing member with a radially projecting flange, existing cylinder house designs do not have to be adapted to a cylinder plug and a securing member according to the invention.

[0010] In accordance with the invention, a lock device is made available comprising:

a cylinder house with a through-opening,

a cylinder plug, which can be received in the through-opening and serves for rotatable engagement with the cylinder house, which cylinder plug has a first end portion comprising a threaded outer peripheral surface, and

a securing member with a through-opening, which securing member has a first portion where the peripheral surface of the through-opening is threaded for engagement with the threaded outer peripheral surface of the first end portion, and a flange which has a cross-sectional dimension greater than a cross-sectional dimension of the through-opening,

and the first portion of the securing member is designed to be received in the through-opening of the cylinder house, with the flange bearing against an outer wall of the cylinder house.

[0011] By making available a lock device in which the securing member that secures the cylinder plug in the cylinder house has a portion arranged in the cylinder house, the cylinder house can counteract radial expansion of the securing member when a strong axial force is applied to the cylinder plug. In particular, the walls of the through-opening of the cylinder house can counteract radial expansion of the first portion of the securing member.

[0012] Moreover, the cylinder house does not need to be modified in order to avoid the cylinder plug being removed from the cylinder house from the front. In the mounted state, the flange of the securing member bears

against the outer wall of the cylinder house and is therefore not received in the through-opening. A function of the flange, achieved by bearing against the rear outer wall of the cylinder plug, is to prevent the cylinder plug from being able to be removed via the front of the cylinder house.

[0013] With the design according to the invention, therefore, the cylinder house does not need to be adapted to receive the securing member. In particular, the through-opening does not need to have a first internal diameter in order to receive the cylinder plug and a second, greater internal diameter in the portion for receiving the securing member. The end surface of the first end portion of the cylinder plug has a screw hole, and the lock device, in the mounted state, further comprises a screw received in the screw hole, which screw hole is arranged such that a part of the head of the screw bears against the inner peripheral surface of the flange in order to secure the flange to the cylinder plug.

[0014] The first end portion of the cylinder plug can have a first external diameter, and a central portion of the cylinder plug can have a second external diameter, which is greater than the first external diameter.

[0015] The design of the cylinder plug means that the cylinder house does not have to be modified in order to be able to receive said portion of the securing member. In particular, this can be achieved by virtue of the fact that the second external diameter can be substantially the same size as the external diameter of the first portion of the securing member.

[0016] The first portion of the securing member can be cylindrical. The cylindrical shape means that the first portion can be easily turned in the through-opening.

[0017] The cylinder plug and the securing member are secured to each other in this way, the result of which is that relative rotation between the cylinder plug and the securing member can be avoided. This reduces the risk of the securing member being unscrewed or released from the cylinder plug upon repeated rotation of the cylinder plug.

[0018] The screw head can have a conical surface designed to bear against the inner peripheral surface of the flange. The conical surface can increase the contact surface between the inner peripheral surface of the flange and the screw head. The increased contact surface means that relative rotation between the cylinder plug and the securing member can be more effectively avoided.

[0019] The inner peripheral surface of the flange can be conical in the axial direction. Upon engagement with a conical screw head, this therefore increases the resistance force against relative rotation occurring between the cylinder plug and the securing member.

[0020] The flange can have at least one groove in the radial direction, in order to permit rotation of the securing member relative to the cylinder plug. In this way, the securing member can be easily mounted on the cylinder plug by means of a tool that engages with said at least

one radial groove.

[0021] One embodiment can further comprise a washer which, in the mounted state, is arranged between the end surface of the end portion and the screw head of the screw, in order thereby to prevent manipulation of the lock device. This therefore reduces the risk of manipulation around the rear end of the lock via the key way of the cylinder plug.

[0022] The cylinder plug can have an integrated tailpiece. By making available a cylinder plug with an integrated tailpiece, the manufacturing process can be simplified, and the tailpiece can have improved strength compared to a tailpiece that is mounted thereon. The risk of manipulation is also reduced since the integrated tailpiece means that there are no openings around the tailpiece in the rear end surface of the cylinder plug, through which openings manipulation could occur.

[0023] The lock device according to the invention can advantageously be used together with a lock case in order thereby to form a lock.

[0024] Further objects and advantages of the invention will become clear from the following detailed description and from the claims.

Description of the figures

[0025] An illustrative embodiment of the invention is described in detail below with reference to the figures, of which:

Fig. 1 shows a perspective view of a lock device according to the invention,

Fig. 2 shows an exploded schematic view of the lock device from Figure 1,

Fig. 3a shows a plan view of the rear face of the lock device from Figure 1, and

Fig. 3b shows a partially cutaway side view of the lock device from Figure 1.

Detailed description

[0026] Figure 1 shows a lock device 1 according to the invention. The lock device 1 comprises a cylinder house 3, a cylinder plug 5 (shown only schematically here by broken lines in order to illustrate that it is received in the cylinder house 3), and a securing member 9.

[0027] Figure 2 shows an exploded schematic view of the lock device 1 from Figure 1. The cylinder house 3 has a first plane outer wall 13-1. The cylinder house 3 has a second plane outer wall 13-2. The first outer wall 13-1 and the second outer wall 13-2 are arranged on opposite sides of the cylinder house 3. The first outer wall 13-1 defines a side of the cylinder house designed to receive a key. The second outer wall 13-2 defines a rear face of the cylinder house 3 designed to bear against

a lock case.

[0028] The cylinder house 3 has a through-opening 15. In the mounted state, the cylinder plug 5 is arranged in the through-opening 15. The cylinder plug 5 is introduced into the through-opening 15 from the side of the cylinder house 3 that has the first outer wall 13-1, from the direction A.

[0029] The second outer wall 13-2 has a cylindrical part 14-1 projecting axially from the second outer wall 13-2. The projecting part has a flange contact surface 14-2 parallel to the second outer wall 13-2.

[0030] The cylinder plug 5 has a key way in which a key can be inserted from a direction A for the purpose of manoeuvring the cylinder plug 5. The cylinder plug has an end surface 6 which, when the cylinder plug 5 is in the mounted state in the cylinder house 3, projects out of the cylinder house 3. The end surface 6 defines an end of the cylinder plug 5 opposite the end that defines the opening of the key way.

[0031] The cylinder plug 5 has a tailpiece 7 arranged at the end surface 6 and integrated with the cylinder plug. The tailpiece 7 comprises two parallel projections separated by a spacing. The tailpiece 7 is arranged to engage with a follower arranged in a lock case. The rotation force to which the cylinder plug 5 is subjected when the cylinder plug 5 is turned relative to the cylinder house 3 is transmitted mechanically by the follower to a tailpiece in a lock case. By mechanical coupling, the tailpiece conveys the rotation force onwards for manoeuvring a dead bolt arranged in the lock case.

[0032] The cylinder plug 5 has three portions extending in the axial direction, each with a different cross-sectional dimension. A first end portion 5-1 has a threaded outer peripheral surface 5'-1. The first end portion 5-1 has a first external diameter d1.

[0033] The next cylinder plug portion is the central portion 5-2 of the cylinder plug 5. The central portion 5-2 has a group of pin openings 8, which run through the cylinder plug to the key way. The central portion 5-2 has a second external diameter d2, which is greater than the first external diameter d1.

[0034] The central portion 5-2 is connected to a second end portion 5-3. The second end portion 5-3 is arranged on an opposite side of the central portion 5-2 from the first end portion 5-1. The second end portion 5-3 has an external diameter d3, which is greater than the external diameter d2 of the central portion 5-2. The second end portion 5-3 thus defines a cylinder-shaped flange of the cylinder plug 5.

[0035] The through-opening 15 has an end portion with a cross-sectional dimension greater than the cross-sectional dimension d4 of the rest of the through-opening 15. This end portion has a cross-sectional dimension substantially the same size as the external diameter d3 of second end portion 5-3. The end portion is designed to receive the second end portion 5-3 of the cylinder plug 5. When the cylinder plug 5 is arranged in the cylinder house 3, a radial surface 5'-3 of the cylinder plug 5 bears

on a corresponding radial surface of the through-opening 15 where the cross-sectional dimension merges directly into the cross-sectional dimension d4. This design prevents the cylinder plug 5 from being able to move axially towards the rear face of the cylinder house 3 as defined by the second outer wall 13-2.

[0036] In the illustrative embodiment described, all of said cross-sectional dimensions are diameters. Said cross-sectional dimensions are therefore circular or substantially circular.

[0037] The securing member 9 has a cylindrical first portion 9-1 and a second portion formed by a flange 9-2. The flange 9-2 is cylindrical and projects radially relative to the first portion 9-1. A through-opening extends through the first portion 9-1 and the flange 9-2.

[0038] The through-opening of the securing member 9 has an internal diameter substantially the same size as the external diameter d1 of the first end portion 5-1. The first portion 9-1 has an inner peripheral surface 9-3 which is threaded. The securing member 9 can therefore be arranged around the threaded first end portion 5-1 of the cylinder plug 5. In this position, the threads of the first end portion 5-1 engage with the threads in the peripheral surface 9-3.

[0039] The first portion 9-1 of the securing member 9 has an external diameter d5 substantially the same size as the internal diameter d4 of the through-opening 15. The first portion 9-1 of the securing member 9 can therefore be introduced into the cylinder house 3. The peripheral surface of the through-opening 15 of the cylinder house 3 thus limits the radial expansion possibilities of the first portion 9-1 of the securing member 9 when acted on axially by the cylinder plug 5.

[0040] The securing member 9 has two radial grooves 10-1 and 10-2 in the end surface of the flange 9-2. Each groove 10-1 and 10-2 runs across the entire radial extent of the end surface of the flange 9-2. In the grooves 10-1 and 10-2, tools can engage with the securing member 9 in order to allow the cylinder plug 5 and the securing member 9 to be screwed together.

[0041] The flange has a cross-sectional dimension d6 greater than the cross-sectional dimension d4 of the through-opening 15 of the cylinder house 3. When the securing member 9 is located in the mounted position, the flange 9-2 thus bears against the flange contact surface 14-2. This is shown in Figure 3b.

[0042] Returning to Figure 2, the end surface 6 of the cylinder plug 5 has a screw hole 11, in which a screw 19 can be screwed. A washer 17 can be secured to the end surface 6 by the screw 19. The washer 17 has two side recesses 17-1 and 17-2 designed to receive the two projections of the tailpiece 7. The washer 17 has a recess 17-3 for receiving the screw 19.

[0043] The head of the screw 19 is preferably cone-shaped. The screw hole 11 preferably has a cone-shaped opening designed to receive a cone-shaped screw head. The peripheral inner surface 9-4 of the flange 9-2 converges in the axial direction towards the first outer wall

13-1. This increases the contact surface between the cone-shaped screw head and the peripheral inner surface 9-4 which, in the mounted position, bears against the cone-shaped screw head.

[0044] The screw hole 11 is arranged near the periphery of the end surface 6 in order to ensure that the head of the screw 19 will bear against the peripheral inner surface 9-4. The fixing of the securing member 9 and of the cylinder plug 5 by means of the screw 19 avoids the securing member 9 and the cylinder plug 5 coming loose from each other upon repeated turning of the cylinder plug 5, for example by means of a key. Figure 3a shows clearly how the screw 19 bears against the peripheral inner surface 9-4 of the flange 9-2.

[0045] Figure 3b shows a partially cutaway side view of the lock device 1. The figure shows the cylinder plug 5 received in the cylinder house 3. The securing member 9 is mounted on the cylinder plug 5. It can be seen in particular that the flange 9-2 bears against the flange contact surface 14-2. This design avoids the cylinder plug 5 being able to be removed by force from the cylinder house 3.

[0046] An illustrative embodiment of the invention has been described above. The invention is not limited to this embodiment and can instead be freely varied within the scope of the attached claims. For example, the flange can have a non-circular cross section. It suffices that the flange has a cross-sectional dimension greater than the diameter d4 of the through-hole. Moreover, the cylinder house can have a substantially plane rear outer wall, against which the flange can bear. In a variation of the invention, the tailpiece, instead of being integrated with the cylinder plug, can be mounted onto the cylinder plug.

Claims

1. Lock device (1) comprising:

a cylinder house (3) with a through-opening (15), a cylinder plug (5), which can be received in the through-opening (15) and serves for rotatable engagement with the cylinder house (3), which cylinder plug (5) has a first end portion (5-1) comprising a threaded outer peripheral surface, and a securing member (9) with a through-opening, which securing member (9) has a first portion (9-1) where the peripheral surface of the through-opening is threaded for engagement with the threaded outer peripheral surface of the first end portion (5-1), and a flange (9-2) which has a cross-sectional dimension d6 greater than a cross-sectional dimension d4 of the through-opening (15), and the first portion (9-1) of the securing member (9) is designed to be received in the through-opening (15) of the cylinder house (3), with the flange (9-2) bearing against an outer wall (14-2)

of the cylinder house (3), wherein the end surface (6) of the first end portion (5-1) of the cylinder plug (5) has a screw hole (11), wherein the lock device (1), in the mounted state, further comprises a screw (19) received in the screw hole (11), which screw hole (11) is arranged such that a part of the head of the screw (19) bears against the inner peripheral surface (9-4) of the flange (9-2) in order to secure the flange (9-2) to the cylinder plug (5).

2. Lock device (1) according to Claim 1, wherein the first end portion (5-1) of the cylinder plug (5) has a first external diameter d1, and a central portion (5-2) of the cylinder plug (5) has a second external diameter d2, which is greater than the first external diameter d1.
3. Lock device (1) according to Claim 2, wherein the second external diameter d2 is substantially the same size as the external diameter d5 of the first portion (9-1) of the securing member (9).
4. Lock device (1) according to any of the preceding claims, wherein the first portion (9-1) of the securing member (9) is cylindrical.
5. Lock device (1) according to any of the preceding claims, wherein the cross-sectional dimension d4 of the through-opening (15) and the external diameter d5 of the first portion (9-1) of the securing member (9) are substantially the same size.
6. Lock device (1) according to any of the preceding claims, wherein the screw head has a conical surface designed to bear against the inner peripheral surface (9-4) of the flange.
7. Lock device (1) according to Claim 6, wherein the inner peripheral surface (9-4) of the flange (9-2) is conical in the axial direction.
8. Lock device (1) according to any of the preceding claims, wherein the flange (9-2) has at least one groove (10-1, 10-2) in the radial direction, in order to permit rotation of the securing member (9) relative to the cylinder plug (5).
9. Lock device (1) according to any of the preceding claims, further comprising a washer (17) which, in the mounted state, is arranged between the end surface (6) of the end portion (5-1) and the screw head of the screw (19), in order thereby to prevent manipulation with the lock device (1).
10. Lock device (1) according to any of the preceding claims, wherein the cylinder plug (5) has an integrated tailpiece (7).

11. Lock comprising a lock device (1) according to any of Claims 1-10 and a lock case, wherein the lock device is designed to engage with the lock case by mechanical coupling.

Patentansprüche

1. Schließvorrichtung (1), umfassend:

ein Zylindergehäuse (3) mit einer durchgehenden Öffnung (15), einem Zylinderstecker (5), der in der durchgehenden Öffnung (15) aufgenommen werden kann und dem drehbaren Eingriff in das Zylindergehäuse (3) dient, wobei der Zylinderstecker (5) einen ersten Endabschnitt (5-1) aufweist, der eine äußere periphere Oberfläche mit Gewinde umfasst, und einem Befestigungselement (9) mit einer durchgehenden Öffnung, wobei das Befestigungselement (9) einen ersten Abschnitt (9-1) aufweist, an dem die periphere Oberfläche der durchgehenden Öffnung ein Gewinde für den Eingriff mit der äußeren peripheren Oberfläche mit Gewinde des ersten Endabschnitts (5-1) aufweist, und einem Flansch (9-2) der eine Querschnittsabmessung d_6 aufweist, die größer ist, als die Querschnittsabmessung d_4 der durchgehenden Öffnung (15), wobei der erste Abschnitt (9-1) des Befestigungselements (9) so aufgebaut ist, dass er in der durchgehenden Öffnung (15) des Zylindergehäuses (3) aufgenommen werden kann, wobei der Flansch (9-2) an einer Außenwand (14-2) des Zylindergehäuses (3) anliegt, wobei die Endoberfläche (6) des ersten Endabschnitts (5-1) des Zylindersteckers (5) ein Schraubenloch (11) aufweist, wobei die Schließvorrichtung (1) im montierten Zustand ferner eine Schraube (19) umfasst, die in dem Schraubenloch (11) aufgenommen wird, wobei das Schraubenloch (11) so angeordnet ist, dass ein Teil des Kopfs der Schraube (19) an der inneren peripheren Oberfläche (9-4) des Flanschs (9-2) anliegt, um den Flansch (9-2) am Zylinderstecker (5) zu sichern.

2. Schließvorrichtung (1) nach Anspruch 1, wobei der erste Endabschnitt (5-1) des Zylindersteckers (5) einen ersten Außendurchmesser d_1 aufweist, und ein mittlerer Abschnitt (5-2) des Zylindersteckers (5) einen zweiten Außendurchmesser d_2 aufweist, der größer ist, als der erste Außendurchmesser d_1 .
3. Schließvorrichtung (1) nach Anspruch 2, wobei der zweite Außendurchmesser d_2 im Wesentlichen dieselbe Größe aufweist, wie der Außendurchmesser d_5 des ersten Abschnitts (9-1) des Befestigungselements (9).

4. Schließvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der erste Abschnitt (9-1) des Befestigungselements (9) zylindrisch ist.

5. Schließvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei die Querschnittsabmessung d_4 der durchgehenden Öffnung (15) und der Außendurchmesser d_5 des ersten Abschnitts (9-1) des Befestigungselements (9) im Wesentlichen die gleiche Größe aufweisen.

6. Schließvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der Schraubkopf eine konische Oberfläche aufweist, die vorgesehen ist, um an der inneren peripheren Oberfläche (9-4) des Flanschs anzuliegen.

7. Schließvorrichtung (1) nach Anspruch 6, wobei die innere periphere Oberfläche (9-4) des Flanschs (9-2) in der axialen Richtung konisch ist.

8. Schließvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der Flansch (9-2) wenigstens eine Kerbe (10-1, 10-2) in der radialen Richtung aufweist, um eine Drehung des Befestigungselements (9) im Verhältnis zu dem Zylinderstecker (5) zu gestatten.

9. Schließvorrichtung (1) nach einem der vorhergehenden Ansprüche, ferner umfassend eine Scheibe (17), die im montierten Zustand zwischen der Endoberfläche (6) des Endabschnitts (5-1) und dem Schraubkopf der Schraube (19) angeordnet ist, um dadurch eine Manipulation der Schließvorrichtung (1) zu verhindern.

10. Schließvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der Zylinderstecker (5) ein integriertes Abschlussstück (7) aufweist.

11. Schloss, umfassend eine Schließvorrichtung (1) nach einem der Ansprüche 1 bis 10 und einen Schlosskasten, wobei die Schließvorrichtung so aufgebaut ist, dass sie durch eine mechanische Kopplung in den Schlosskasten eingreift.

Revendications

1. Dispositif de verrouillage (1) comprenant :

un boîtier de cylindre (3) doté d'un orifice traversant (15),

un bouchon de cylindre (5) qui peut être reçu dans l'orifice traversant (15) et permet un engagement rotatif dans le boîtier de cylindre (3), lequel bouchon de cylindre (5) comporte une première section terminale (5-1) comprenant une

- surface périphérique extérieure filetée et un élément d'assujettissement (9) doté d'un orifice traversant, lequel élément d'assujettissement (9) comporte une première section (9-1) où la surface périphérique de l'orifice traversant est filetée pour s'engager dans la surface périphérique extérieure filetée de la première section terminale (5-1) et une bride (9-2) qui a une section transversale d_4 supérieure à une dimension de section transversale de l'orifice traversant (15),
- et la première section (9-1) de l'élément d'assujettissement (9) est conçue pour être reçue dans l'orifice traversant (15) du boîtier de cylindre (3), la bride (9-2) portant contre une paroi extérieure (14-2) du boîtier de cylindre (3), la surface terminale (6) de la première section terminale (5-1) du bouchon de cylindre (5) comportant un trou de vis (11), le dispositif de verrouillage (1) comprenant en outre, en état monté, une vis (19) reçue dans le trou de vis (11), lequel trou de vis (11) est disposé de manière à ce qu'une partie de la tête de la vis (19) porte contre la surface périphérique intérieure (9-4) de la bride (9-2) afin de bloquer la bride (9-2) sur le bouchon de cylindre (5).
2. Dispositif de verrouillage (1) selon la revendication 1, dans lequel la première section terminale (5-1) du bouchon de cylindre (5) a un premier diamètre extérieur d_1 et une section centrale (5-2) du bouchon de cylindre (5) a un second diamètre extérieur d_2 qui est supérieur au premier diamètre extérieur d_1 .
 3. Dispositif de verrouillage (1) selon la revendication 2, dans lequel le second diamètre extérieur d_2 est sensiblement égal au diamètre extérieur d_5 de la première section (9-1) de l'élément d'assujettissement (9).
 4. Dispositif de verrouillage (1) selon l'une quelconque des revendications précédentes, dans lequel la première section (9-1) de l'élément d'assujettissement (9) est cylindrique.
 5. Dispositif de verrouillage (1) selon l'une quelconque des revendications précédentes, dans lequel la dimension de section transversale d_4 de l'orifice traversant (15) et le diamètre extérieur d_5 de la première section (9-1) de l'élément d'assujettissement (9) sont sensiblement égaux.
 6. Dispositif de verrouillage (1) selon l'une quelconque des revendications précédentes, dans lequel la tête de vis a une surface conique conçue pour porter contre la surface périphérique extérieure (9-4) de la bride.
 7. Dispositif de verrouillage (1) selon la revendication 6, dans lequel la surface périphérique intérieure (9-4) de la bride (9-2) est conique dans le sens axial.
 8. Dispositif de verrouillage (1) selon l'une quelconque des revendications précédentes, dans lequel la bride (9-2) comporte au moins une gorge (10-1, 10-2) dans le sens radial afin de permettre la rotation de l'élément d'assujettissement (9) par rapport au bouchon de cylindre (5).
 9. Dispositif de verrouillage (1) selon l'une quelconque des revendications précédentes, comprenant en outre une rondelle (17) qui, en état monté, est disposée entre la surface terminale (6) de la section terminale (5-1) et la tête de vis de la vis (19) afin d'empêcher ainsi sa manipulation avec le dispositif de verrouillage (1).
 10. Dispositif de verrouillage (1) selon l'une quelconque des revendications précédentes, dans lequel le bouchon de cylindre (5) comporte un embout intégré (7).
 11. Zéro comprenant un dispositif de verrouillage (1) selon l'une quelconque des revendications 1 à 10 et un compartiment de verrou, le dispositif de verrouillage étant conçu pour s'engager dans le compartiment de verrou par accouplement mécanique.

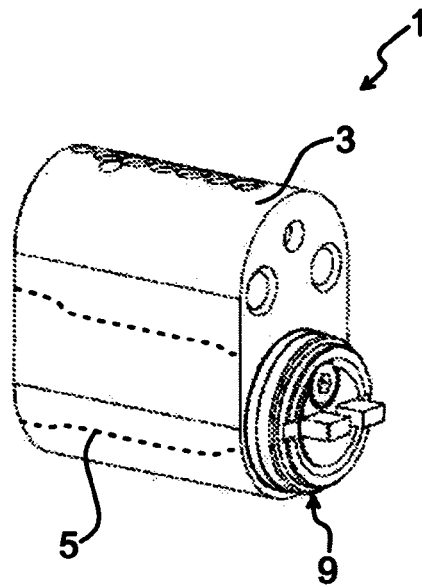


Fig. 1

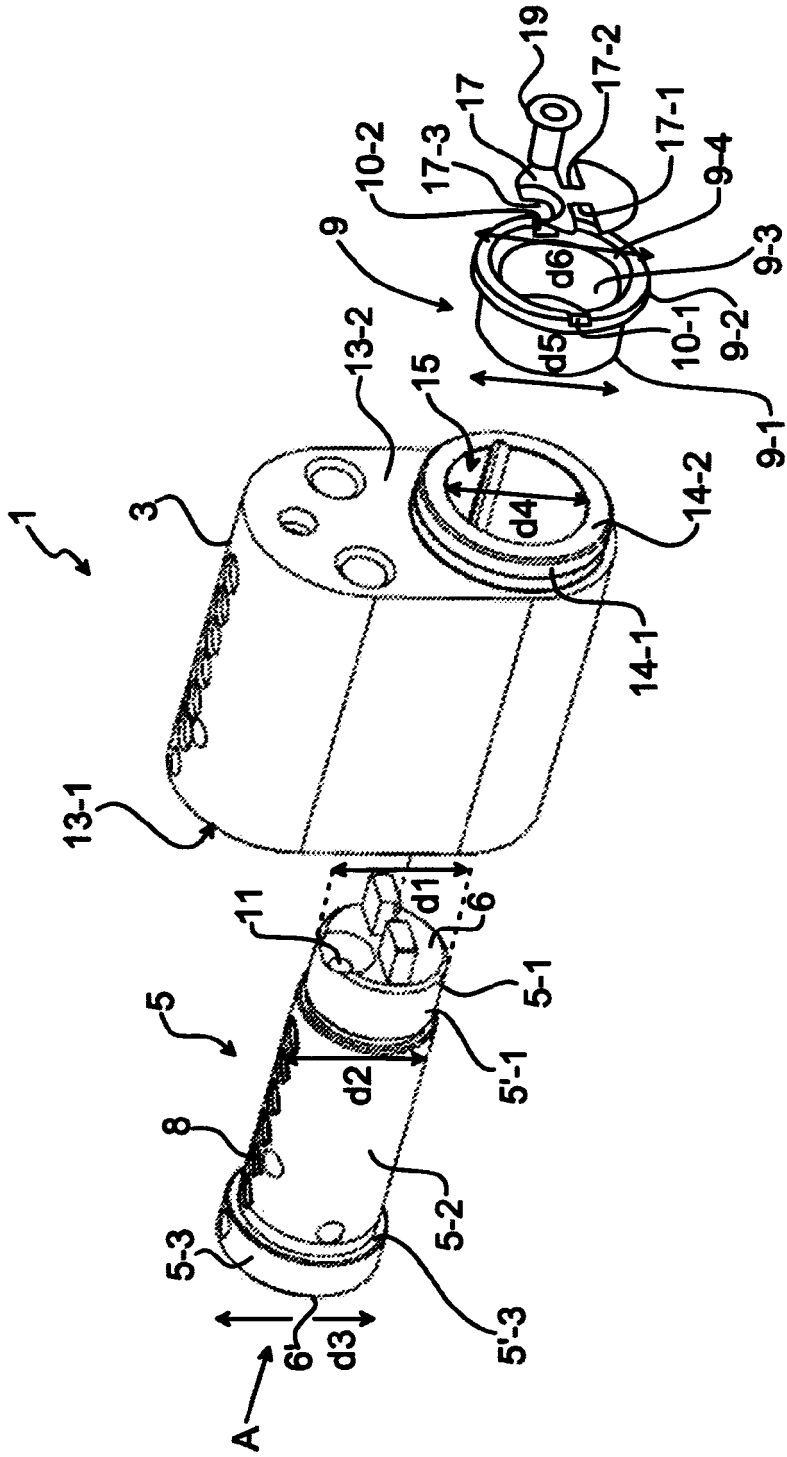


Fig. 2

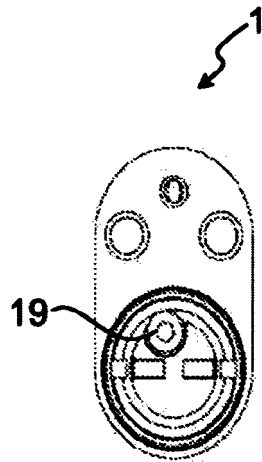


Fig. 3a

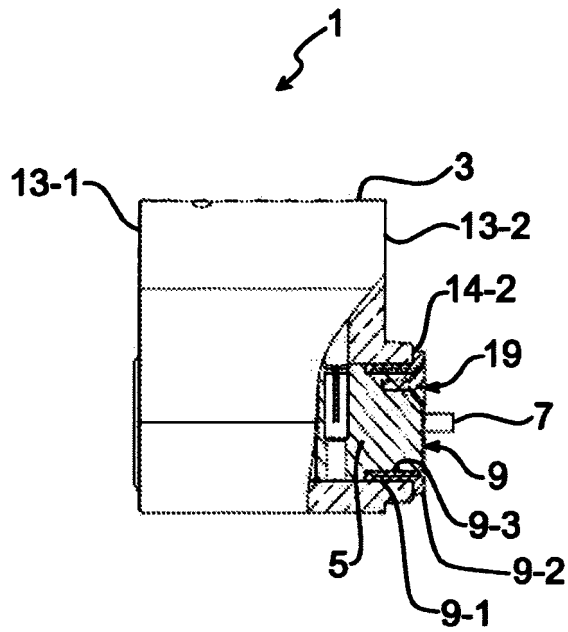


Fig. 3b

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4711106 A [0005]