



(11) **EP 2 398 981 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
17.07.2019 Bulletin 2019/29

(51) Int Cl.:
E05B 19/02 ^(2006.01) **E05B 19/04** ^(2006.01)
E05B 27/10 ^(2006.01)

(21) Application number: **10744025.7**

(86) International application number:
PCT/SE2010/050187

(22) Date of filing: **18.02.2010**

(87) International publication number:
WO 2010/096008 (26.08.2010 Gazette 2010/34)

(54) **PROFILED KEY WITH LOCAL RECESS**

PROFILIERTER SCHLÜSSEL MIT LOKALER VERTIEFUNG

CLÉ PROFILÉE COMPORTANT UN CREUX LOCAL

(84) Designated Contracting States:
**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 SE SI SK SM TR**
Designated Extension States:
AL BA RS

(30) Priority: **18.02.2009 SE 0900209**

(43) Date of publication of application:
28.12.2011 Bulletin 2011/52

(73) Proprietor: **Winloc AG**
6304 Zug (CH)

(72) Inventor: **WIDÉN, Bo**
S-644 36 Torshälla (SE)

(74) Representative: **Modin, Jan**
Noréns Patentbyrå AB
Narvavägen 12
Box 10198
S-100 55 Stockholm (SE)

(56) References cited:
EP-A1- 0 982 452 EP-A1- 1 013 856
EP-A2- 0 237 172 WO-A2-2005/008001
AT-B- 392 508 DE-A1- 3 817 494
GB-A- 2 239 672 US-A- 5 715 717
US-A- 5 845 525 US-A1- 2005 061 043

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description**SHORT DESCRIPTION OF THE DRAWINGS****FIELD AND BACKGROUND OF THE INVENTION****[0008]**

[0001] The present invention relates to a combination of a key and a cylinder lock,

- said cylinder lock comprising a rotatable key plug having a longitudinal keyway, and a longitudinal profile rib extending along said longitudinal keyway, and
- said key comprising a substantially flat key blade having a longitudinally extending profile groove (61) at at least one side surface thereof,
- said profile groove having a profile shape being substantially supplementary to said profile rib and being provided with an inner, longitudinally straight portion corresponding to the outermost portion of said profile rib, said inner portion of said profile groove extending along at least a part of said key blade.

[0002] Similar lock and key combinations are generally known, e.g. from the US patents 5715717 and 5845525 (both in the name Widen). The profile groove or grooves in the key will provide great possibilities to vary the cross-sectional profile of the key, which is a great advantage.

[0003] Another similar prior art lock and combination is disclosed in the Austrian patent specification AT 392 508 B (EVVA-WERK), where a profiled guiding groove in a key is adapted to accommodate a projection on a moveable tumbler. The guiding groove is, however, not straight but rather wave-like and divided into different deep and shallow parts.

OBJECT OF THE INVENTION

[0004] The object of the present invention is to provide a key, cooperating with a blocking mechanism in the lock, serving to axially block the insertion of an incorrectly cut key blade and providing an increased number of profile varieties.

SUMMARY OF THE INVENTION

[0005] According to the present invention, this object is achieved by providing a lock and key combination according to claim 1.

[0006] As will be explained below, the locally expanded portion of the profile groove will accommodate a blocking element arranged in the associated lock, upon moving the blocking element from an initial position to a second position enabling full insertion of the key blade into the lock. In case a differently cut key blade is inserted, i.e. a key blade without a local recess adjacent to the profile groove, the blocking element of the lock will stop the key blade from being fully inserted into the keyway.

[0007] The key may be configured in various ways, in accordance with the dependent claims and as explained further below with reference to the appended drawings.

Figure 1a shows, in a side view, a cylinder lock, with a key blade inserted therein;

Figure 1b shows the cylinder lock and key combination of fig. 1a in a perspective view;

Figure 1c shows the lock and key combination of fig. 1a in a perspective, exploded view, illustrating a locking mechanism above the keyway of the lock and the key blade according to the invention;

Figure 1d shows a cross-section along the line Id-Id in figure 1a also illustrating a blocking element arranged in the key plug of the lock;

Figure 1e shows a cross-section as in fig. 1d, but without a key;

Figure 1f shows a cross-section along the line 1f-1f in figure 1a;

Figures 2a, 2b show schematically in perspective views how the key blade interacts with the blocking element of the lock (fig. 2b at a larger scale);

Figures 3a and 3b show the key blade of figures 2a, 2b in a side view (fig. 2b at a larger scale);

Figure 4 shows, in a side view, a key blade and a blocking element located close to the entrance of the keyway;

Figure 5 and 6 show the blocking element and the key blade of fig. 4 in a cross-sectional view and an end view, respectively.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0009] In figures 1a, 1b, 1c, 1d, 1e, 1f there is shown a cylinder lock and key combination having conventional upper and lower tumbler pins 1, 2 in a linear row (fig. 1c) cooperating with an upper edge of the inserted key blade, the upper edge having a corresponding number of recess cuts 11, 12, 13, 14, 15, 16 at various levels. Deep inside the keyway of the lock, not very far from the tip of the inserted key blade, there is a blocking element 20, which is movable elevationally (up and down) at the side of the keyway.

[0010] The blocking element, and its interaction with the inserted key blade, will be better understood from figure 1d. Here, the cylindrical housing of the lock is denoted 30, having an upright housing part 31 accommodating the upper locking pins 1,2 mentioned above and

a cylindrical bore 32, in which a cylindrical key plug 33 is rotatably journaled.

[0011] The key plug 33 has a central keyway 50 extending longitudinally along the axis of the cylindrical bore 32 and a central plane A extending through the cylindrical axis and the upper housing portion 31. In a longitudinal row in this plane A, there are a number of cylindrical holes (not visible in fig. 1d) each accommodating one of the lower locking pins 2. In figures 1d and 1e, the profile of the keyway 50 and the corresponding key blade 60 are clearly visible. The keyway 50 is oriented along the central plane A. It has a lower, rather wide portion 50a, and an upper, relatively narrow portion 50b. The upper and lower portions of the keyway have side walls 50c and 50d lying in a common plane in parallel to the central plane A (to the right thereof in figure 3). At the other lateral side, the upper keyway portion 50b has a side wall 50e, whereas the lower part of the keyway has a side wall 50f, the latter being located further away from the central plane A than the upper side wall 50e.

[0012] On the right hand side of the keyway, there is a longitudinal, profiled rib 51 extending along the key plug. The profile rib 51 has a base portion 52 (concealed by the blocking element 20 in fig. 1d) and an end portion 53 provided with a downwardly directed tongue 54.

[0013] On the left hand side, the keyway has two longitudinal ribs 55 and 56 at the lower portion of the keyway.

[0014] The key blade 60 (see fig. 1d), according to the present invention, has a profile shape which is substantially supplementary to the keyway 50. Accordingly, the key 60 has a lower base portion 60a, which is relatively wide, and an upper portion 60b, which is relatively narrow.

[0015] At the right hand side (as seen in figure 1d) the key blade has a longitudinally extending groove 61 with an outer portion 62, and an inner, undercut portion 63. The profile groove 61 has an inner wall 64 and an opposite side wall 65, which is inclined and faces the bottom wall 64 and also forms the inside wall of a ridge 66 extending along the key blade 60.

[0016] As will be evident from figure 1d, the profile groove 61 accommodates the longitudinally extending profile rib 51, including the downwardly directed tongue 54 in the undercut portion of the groove 61.

[0017] On the left hand side, the key blade 60 has two longitudinal grooves 67 and 68 corresponding to the profile ribs 55, 56.

[0018] As appears from figure 1f, the outer portion 62 of the profile groove 61, and the corresponding base portion 52 of the profile rib 51 has a slanted upper wall 69 and a slanted surface 59, respectively.

[0019] Now, since the sectional profile of the key blade 60 corresponds to the cross-sectional profile of the keyway 50, the key blade 60 can be inserted partially or fully into the keyway, as is known in the art. Of course, only key blades being cut with the particular profile of the keyway may be fully inserted into the keyway.

[0020] In order to allow for further variations of the ex-

act profile of the keyway, there is provided, according to the present invention, a blocking element 20 (as mentioned above) which can be regarded as a movable profile portion.

[0021] Generally, the blocking element has a profile section, which corresponds to the longitudinally extending groove 61 in the key blade. However, in the region of the outer portion 62 of the groove 61, it is somewhat larger, in a direction parallel to the central plane A. So, it does not fit into the profile groove of the keyway along the full length thereof.

[0022] However, according to the present invention, the key blade 60 is provided with a local recess 70 which constitutes a locally expanded portion of the profile groove 61 and is wide enough to accommodate the uppermost portion of the blocking element 20, as will be explained more fully below.

[0023] In order to secure a well-defined mobility of the blocking element 20, it is integrated with or firmly connected to a body 23, which is guided for elevational movement in parallel to the central plane A of the key way in a substantially cylindrical cavity 24 at the side of the keyway, in parallel to the central plane A. Thus, the body 23 is guided for movement up and down in the cylindrical cavity 24, so that the integrated or connected blocking element 20 is also movable up and down.

[0024] The blocking element 20 may protrude partially or fully into the profile groove 61, in a cut-out portion of the profile rib. 51.

[0025] The interaction between the blocking element and the key blade is illustrated in figures 2a, 2b, 3a, 3b. Initially, when the keyway 50 is empty (see fig. 1e), the blocking element 20 will be positioned in its lowermost position, because of the action of a compression spring 26 in the cavity 24 (figure 1d). In the embodiment of figures 2a, 2b, 3a, 3b, the profile groove 61 of the key blade 60 has no undercut portion, but this will not make any difference to the interaction between the key blade and the blocking element 20.

[0026] When the key blade 60 is inserted into the keyway 50, a lower, first portion 21 of the blocking element 20 will make contact with a ramp surface 75 near the tip end of the key blade. By way of this contact, the blocking element 20 will move upwards and take the position shown in figures 1d and 2b. Here, the upper, second portion 22 of the blocking element 20 will be accommodated in the above-mentioned recess 70, which is locally cut out in this particular part of the key blade, so the width of the profile groove is effectively widened in this region.

[0027] Without such a recess 70, the blocking element would be jammed between the ramp surface 75 and the upper, slanted wall 69 of the longitudinal profile groove.

[0028] In the embodiment shown in figures 2a and 2b, the blocking pin 20 is located deep inside the keyway near the tip end of the key blade upon full insertion of the key blade into the keyway. The first or lower projecting portion 21 of the blocking element 20 contacts a machined, slightly recessed surface 76 (fig. 3b) adjacent to

the lower side wall of the profile groove (in this embodiment there is no undercut portion), whereas the upper or second projecting portion 22 of the blocking element 20 is accommodated in the local recess 70. This recess 70 is confined to the region of the fully inserted key blade in the vicinity of the blocking element 20. In figures 4, 5, 6, the blocking element 20 is located closer to the entrance of the keyway, so when the key blade is fully inserted into the keyway, the blocking element 20 is far away from the tip end of key blade. In order to accommodate the whole cross-section of the blocking element 20, the lower part of the key blade material next to the groove 61 is taken away. Thus, the ridge portion 66, except for a portion near the tip end of the key blade, is cut away up to the location of the blocking element, leaving a lower side wall 77. In this case, of course, the local upper recess, accommodating the second or upper projecting portion 22 of the blocking element 20 is located so as to start, with some overlap, where the lower side wall 77 and an adjoining inclined or ramp surface 78 ends. The overlap length should correspond to or slightly exceed the dimension of the blocking element 20 in the longitudinal direction of the key plug.

[0029] The upper, slanted wall portion of the recess 70 has an angle corresponding to the second projecting portion 22 of the blocking element 20.

[0030] As will be seen from figure 4, the key blade is provided with a second local recess 70 near the tip end, just like the key blade shown in figures 3a and 3b. Therefore, the key blade of figure 4 will cooperate also with a blocking element 20 arranged deep inside the keyway, like the one shown in figure 2b.

[0031] Accordingly, by having two or more blocking elements distributed longitudinally along the keyway, it is possible to provide a hierarchic system with master keys that open all individual locks having blocking pins at various locations.

[0032] The blocking element in the lock may be urged to move up and down only by interaction with the profile groove and its adjoining recesses above and below the groove, without any spring acting on the body in the side cavity. Thus, the blocking element will then be positively guided by the upper and lower side walls of the partially expanded profile groove.

[0033] The exact configuration of the key blade may differ from the embodiments described herein, within the scope of the appended claims.

Claims

1. A combination of a key and a cylinder lock,

- said cylinder lock comprising a rotatable key plug having a longitudinal keyway (50), and a longitudinal profile rib (51) extending along said longitudinal keyway, and
- said key comprising a substantially flat key

blade (60) having a longitudinally extending profile groove (61) at at least one side surface thereof,

- said profile groove having a profile shape being substantially supplementary to said profile rib (51) and being provided with an inner, longitudinally straight portion corresponding to the outermost portion of said profile rib, said inner portion of said profile groove extending along at least a part of said key blade,

characterized in that

- said cylinder lock comprises at least one blocking element (20) serving to axially block the insertion of an incorrectly cut key blade, said blocking element being movable up and down in said keyway in a cut-out portion of said profile rib (51), and having a profile section which corresponds to the longitudinally extending groove (61) in the key blade,

- said blocking element (20), in a region of an outer portion (62) of the profile groove (61) of said key blade, is somewhat larger, in a direction parallel to a central plane (A) of the cylinder lock, so that it does not fit into the profile groove of the keyway along the full length thereof,

- said key blade is provided with at least one local recess (70) adjacent to said profile groove, said local recess constituting a locally expanded portion of said profile groove, said at least one local recess (70) being wide enough to accommodate an uppermost portion (22) of the blocking element, and being limited to a longitudinally confined portion of the key blade which is confined to the region of the fully inserted key blade in the vicinity of said blocking element (20) and which is shorter than said part of the key blade and allows said uppermost portion (22) of the blocking element to be accommodated therein, and

- said locally expanded portion of the profile groove (61) has a cross-section with two opposite, non-symmetrical side walls, which extend in the longitudinal direction of the key blade.

2. A combination as defined in claim 1, wherein said inner, straight portion of said profile groove (61) of the key blade has a substantially rectangular cross-section.

3. A combination as defined in claim 1, wherein said inner, straight portion of said profile groove (61) of the key blade has an undercut part.

4. A combination as defined in claim 1, wherein said profile groove (61) in the side surface of said key blade has an outer, longitudinally straight portion extending along at least a part of the length of said inner, straight portion and merging with the latter,

said outer, longitudinally straight portion of the groove having an upper wall (69) being slanted and facing away from the key blade.

5. A combination as defined in claim 4, wherein said locally expanded portion of the profile groove has a first or lower wall portion (76), oriented substantially perpendicularly to said side surface of the key blade, and a second or upper, slanted wall portion (69) being inclined so as to face outwardly from the associated side of the key blade. 5
10
6. A combination as defined in claim 1, wherein said locally expanded portion (70) of the profile groove has a longitudinally adjoining opposite recess (75,77) at the opposite side wall of the profile groove, said longitudinally adjoining opposite recess being located opposite to said local recess and, in the longitudinal direction, closer to the tip end of the key blade. 15
20
7. A combination as defined in claim 6, wherein said longitudinally adjoining recess is constituted by a ramp surface (75) leading from the bottom edge of the key blade into said profile groove. 25
8. A combination as defined in claim 6, wherein said longitudinally adjoining opposite recess is a recess (77) in said opposite side wall and has a longitudinally straight surface extending in parallel to said profile groove. 30
9. A combination as defined in claim 6, wherein the key blade has at least two locally expanded profile groove portions (70), and an adjoining opposite recess (77) between each pair of such locally expanded profile groove portions. 35
10. A combination as defined in claim 6, wherein there is a longitudinal overlap between said locally expanded profile groove portion (70) and said longitudinally adjoining opposite recess (77). 40

Patentansprüche

1. Kombination aus einem Schlüssel und einem Zylinderschloss,
 - wobei das Zylinderschloss einen drehbaren Schlüsselkanal mit einer Längsnut (50) und eine Längsprofilrippe (51) umfasst, die sich entlang der Längsnut erstreckt, und
 - wobei der Schlüssel ein im Wesentlichen flaches Schlüsselblatt (60) mit einer sich in Längsrichtung erstreckenden Profilnut (61) an mindestens einer Seitenfläche davon umfasst,
 - wobei die Profilnut eine Profilform aufweist, die

im Wesentlichen ergänzend zu der Profilrippe (51) ist und mit einem inneren, in Längsrichtung geraden Abschnitt versehen ist, der dem äußersten Abschnitt der Profilrippe entspricht, wobei sich der innere Abschnitt der Profilnut entlang mindestens eines Teils des Schlüsselblattes erstreckt,

dadurch gekennzeichnet, dass

- das Zylinderschloss mindestens ein Sperrelement (20) umfasst, das dazu dient, das Einführen eines falsch geschnittenen Schlüsselblattes axial zu blockieren, wobei das Sperrelement in der Keilnut in einem Ausschnittabschnitt der Profilrippe (51) auf und ab beweglich ist und einen Profilabschnitt aufweist, der der sich in Längsrichtung erstreckenden Nut (61) in dem Schlüsselblatt entspricht,
- das Sperrelement (20) in einem Bereich eines Außenabschnitts (62) der Profilnut (61) des Schlüsselblattes etwas größer ist, in einer Richtung parallel zu einer Mittelebene (A) des Zylinderschlosses, so dass es nicht in die Profilnut der Keilnut entlang ihrer gesamten Länge passt,
- das Schlüsselblatt mit mindestens einer lokalen Aussparung (70) angrenzend an die Profilnut versehen ist, wobei die lokale Aussparung einen lokal erweiterten Abschnitt der Profilnut bildet, wobei die mindestens eine lokale Aussparung (70) breit genug ist, um einen obersten Abschnitt (22) des Sperrelements aufzunehmen, und auf einen in Längsrichtung begrenzten Abschnitt des Schlüsselblattes begrenzt ist, der auf den Bereich des vollständig eingefügten Schlüsselblattes in der Nähe des Sperrelements (2c) beschränkt ist und der kürzer als der Teil des Schlüsselblattes ist und die Aufnahme des obersten Abschnitts (22) des Sperrelements darin ermöglicht, und
- der lokal erweiterte Abschnitt der Profilnut (61) einen Querschnitt mit zwei gegenüberliegenden, unsymmetrischen Seitenwänden aufweist, die sich in Längsrichtung des Schlüsselblattes erstrecken.

2. Kombination nach Anspruch 1, wobei der innere gerade Abschnitt der Profilnut (61) des Schlüsselblattes einen im Wesentlichen rechteckigen Querschnitt aufweist. 45
3. Kombination nach Anspruch 1, wobei der innere gerade Abschnitt der Profilnut (61) des Schlüsselblattes einen hinterschnittenen Teil aufweist. 50
4. Kombination nach Anspruch 1, wobei die Profilnut (61) in der Seitenfläche des Schlüsselblattes einen äußeren, in Längsrichtung geraden Abschnitt aufweist, der sich entlang mindestens eines Teils der Länge des inneren, geraden Abschnitts erstreckt 55

und mit Letzterem verschmilzt, wobei der äußere, längsgerade Abschnitt der Nut eine obere Wand (69) aufweist, die geneigt und dem Schlüsselblatt abgewandt ist.

5. Kombination nach Anspruch 4, wobei der lokal erweiterte Abschnitt der Profilnut einen ersten oder unteren Wandabschnitt (76), der im Wesentlichen senkrecht zu der Seitenfläche des Schlüsselblattes ausgerichtet ist, und einen zweiten oder oberen, geneigten Wandabschnitt (69) aufweist, der so geneigt ist, dass er von der zugehörigen Seite des Schlüsselblattes nach außen zeigt. 5 10
6. Kombination nach Anspruch 1, wobei der lokal erweiterte Abschnitt (70) der Profilnut eine in Längsrichtung angrenzende gegenüberliegende Aussparung (75, 77) an der gegenüberliegenden Seitenwand der Profilnut aufweist, wobei die in Längsrichtung angrenzende gegenüberliegende Aussparung gegenüber der lokalen Aussparung und in Längsrichtung näher am Spitzenende des Schlüsselblattes angeordnet ist. 15 20
7. Kombination nach Anspruch 6, wobei die in Längsrichtung angrenzende Aussparung durch eine Rampefläche (75) gebildet wird, die von der Unterkante des Schlüsselblattes in die Profilnut führt. 25
8. Kombination nach Anspruch 6, wobei die in Längsrichtung angrenzende gegenüberliegende Aussparung eine Aussparung (77) in der gegenüberliegenden Seitenwand ist und eine in Längsrichtung gerade Oberfläche aufweist, die sich parallel zu der Profilnut erstreckt. 30 35
9. Kombination nach Anspruch 6, wobei das Schlüsselblatt mindestens zwei lokal erweiterte Profilnutabschnitte (70) und eine angrenzende gegenüberliegende Aussparung (77) zwischen jedem Paar solcher lokal erweiterter Profilnutabschnitte aufweist. 40
10. Kombination nach Anspruch 6, wobei eine Längsüberlappung zwischen dem lokal erweiterten Profilnutabschnitt (70) und der in Längsrichtung angrenzenden gegenüberliegenden Aussparung (77) besteht. 45

Revendications 50

1. Combinaison d'une clé et d'une serrure à barillet,
 - ladite serrure à barillet comprenant un barillet à clé rotatif comportant une rainure de clavette longitudinale (50), et une nervure de profil longitudinale (51) qui s'étend le long de ladite rainure de clavette longitudinale ; et 55

- ladite clé comprenant une lame de clé sensiblement plate (60) qui comporte une gorge de profil s'étendant longitudinalement (61) au niveau d'au moins une surface latérale de ladite lame ;

- ladite gorge de profil présentant une forme de profil qui est sensiblement complémentaire par rapport à celle de ladite nervure de profil (51) et qui est munie d'une portion interne rectiligne longitudinalement qui correspond à la portion la plus externe de ladite nervure de profil, ladite portion interne de ladite gorge de profil s'étendant le long d'au moins une partie de ladite lame de clé ;

caractérisée en ce que :

- ladite serrure à barillet comprend au moins un élément de blocage (20) servant à bloquer axialement l'insertion d'une lame de clé coupée de façon incorrecte, ledit élément de blocage pouvant être déplacé vers le haut et vers le bas à l'intérieur de ladite rainure de clavette dans une portion découpée de ladite nervure de profil (51), et comportant une section de profil qui correspond à la gorge s'étendant longitudinalement (61) qui est ménagée dans la lame de clé ;

- ledit élément de blocage (20), dans une région d'une portion externe (62) de la gorge de profil (61) de ladite lame de clé, est quelque peu plus grand, dans une direction qui est parallèle à un plan central (A) de la serrure à barillet, de sorte qu'il ne s'emboîte pas à l'intérieur de la gorge de profil de la rainure de clavette le long de la totalité de sa longueur ;

- ladite lame de clé est munie d'au moins un évidement local (70) qui est adjacent à ladite gorge de profil, ledit évidement local constituant une portion étendue localement de ladite gorge de profil, ledit au moins un évidement local (70) étant suffisamment large pour qu'il loge une portion la plus supérieure (22) de l'élément de blocage, et étant limité à une portion confinée longitudinalement de la lame de clé qui est confinée à la région de la lame de clé insérée complètement au voisinage dudit élément de blocage (2c) et qui est plus courte que ladite partie de la lame de clé et qui permet que ladite portion la plus supérieure (22) de l'élément de blocage soit logée dedans ; et

- ladite portion étendue localement de la gorge de profil (61) présente une section en coupe transversale avec deux parois latérales non symétriques opposées, lesquelles parois s'étendent dans la direction longitudinale de la lame de clé.

2. Combinaison telle que définie selon la revendication

- 1, dans laquelle portion interne rectiligne de ladite gorge de profil (61) de la lame de clé présente une section en coupe transversale sensiblement rectangulaire.
3. Combinaison telle que définie selon la revendication 1, dans laquelle ladite portion interne rectiligne de ladite gorge de profil (61) de la lame de clé comporte une partie en contre-dépouille.
4. Combinaison telle que définie selon la revendication 1, dans laquelle ladite gorge de profil (61) dans la surface latérale de ladite lame de clé comporte une portion externe rectiligne longitudinalement qui s'étend le long d'au moins une partie de la longueur de ladite portion interne rectiligne et qui fusionne avec cette dernière, ladite portion externe rectiligne longitudinalement de la gorge de profil comportant une paroi supérieure (69) qui est oblique et à distance de la lame de clé tout en lui faisant face.
5. Combinaison telle que définie selon la revendication 4, dans laquelle ladite portion étendue localement de la gorge de profil comporte une première portion de paroi ou portion de paroi inférieure (76), qui est orientée sensiblement perpendiculairement par rapport à ladite surface latérale de la lame de clé, et une seconde portion de paroi oblique ou portion de paroi oblique supérieure (69) qui est inclinée de manière à ce qu'elle fasse face vers l'extérieur par rapport au côté associé de la lame de clé.
6. Combinaison telle que définie selon la revendication 1, dans laquelle ladite portion étendue localement (70) de la gorge de profil comporte un évidement opposé contigu longitudinalement (75, 77) au niveau de la paroi latérale opposée de la gorge de profil, ledit évidement opposé contigu longitudinalement étant localisé à l'opposé dudit évidement local et, dans la direction longitudinale, plus près de l'extrémité de pointe de la lame de clé.
7. Combinaison telle que définie selon la revendication 6, dans laquelle ledit évidement contigu longitudinalement est constitué par une surface en rampe (75) qui va depuis le bord de fond de la lame de clé jusqu'à l'intérieur de ladite gorge de profil.
8. Combinaison telle que définie selon la revendication 6, dans laquelle ledit évidement opposé contigu longitudinalement est un évidement (77) qui est ménagé dans ladite paroi latérale opposée et qui comporte une surface rectiligne longitudinalement qui s'étend en parallèle à ladite gorge de profil.
9. Combinaison telle que définie selon la revendication 6, dans laquelle la lame de clé comporte au moins deux portions de gorge de profil étendues localement (70), et un évidement opposé contigu (77) entre chaque paire de ces portions de gorge de profil étendues localement.
10. Combinaison telle que définie selon la revendication 6, dans laquelle il y a un chevauchement longitudinal entre ladite portion de gorge de profil étendue localement (70) et ledit évidement opposé contigu longitudinalement (77).

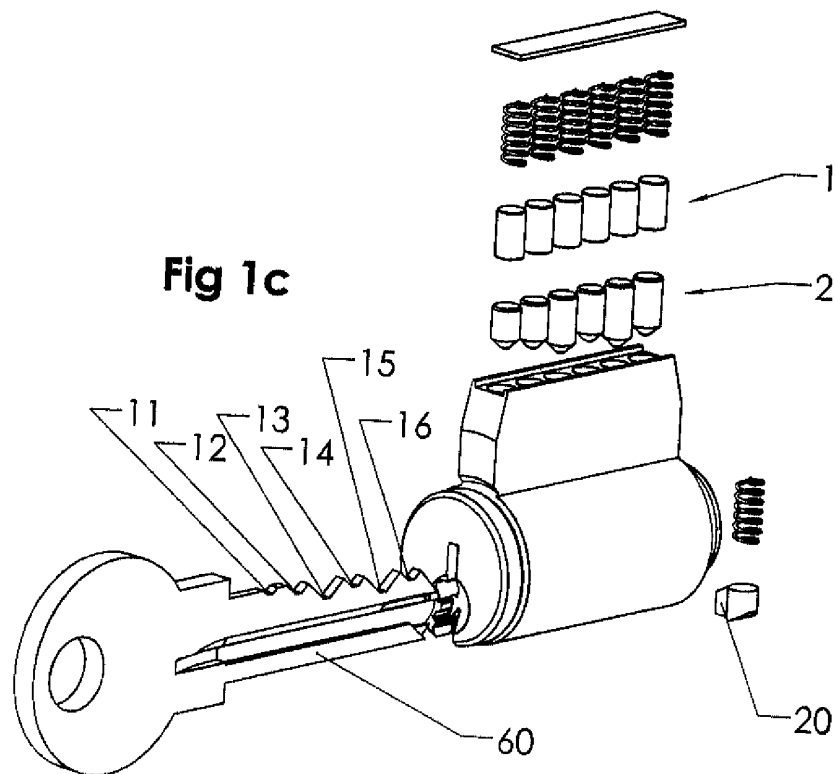
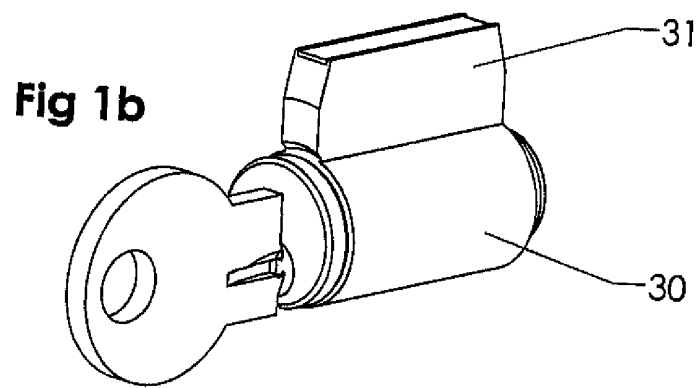
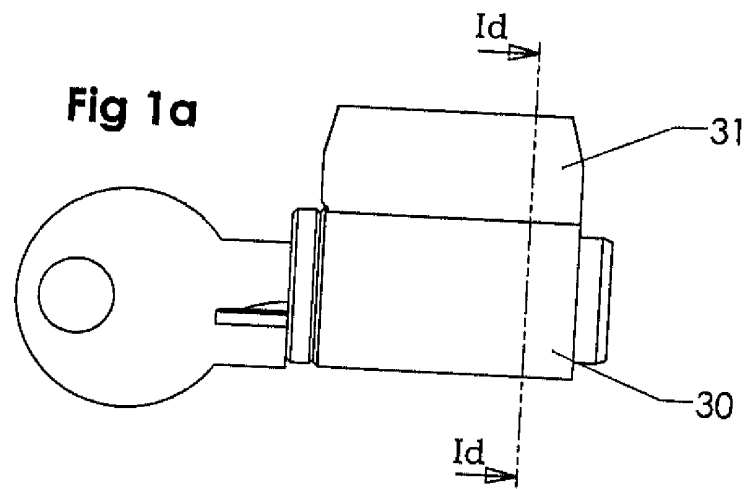


Fig 1d

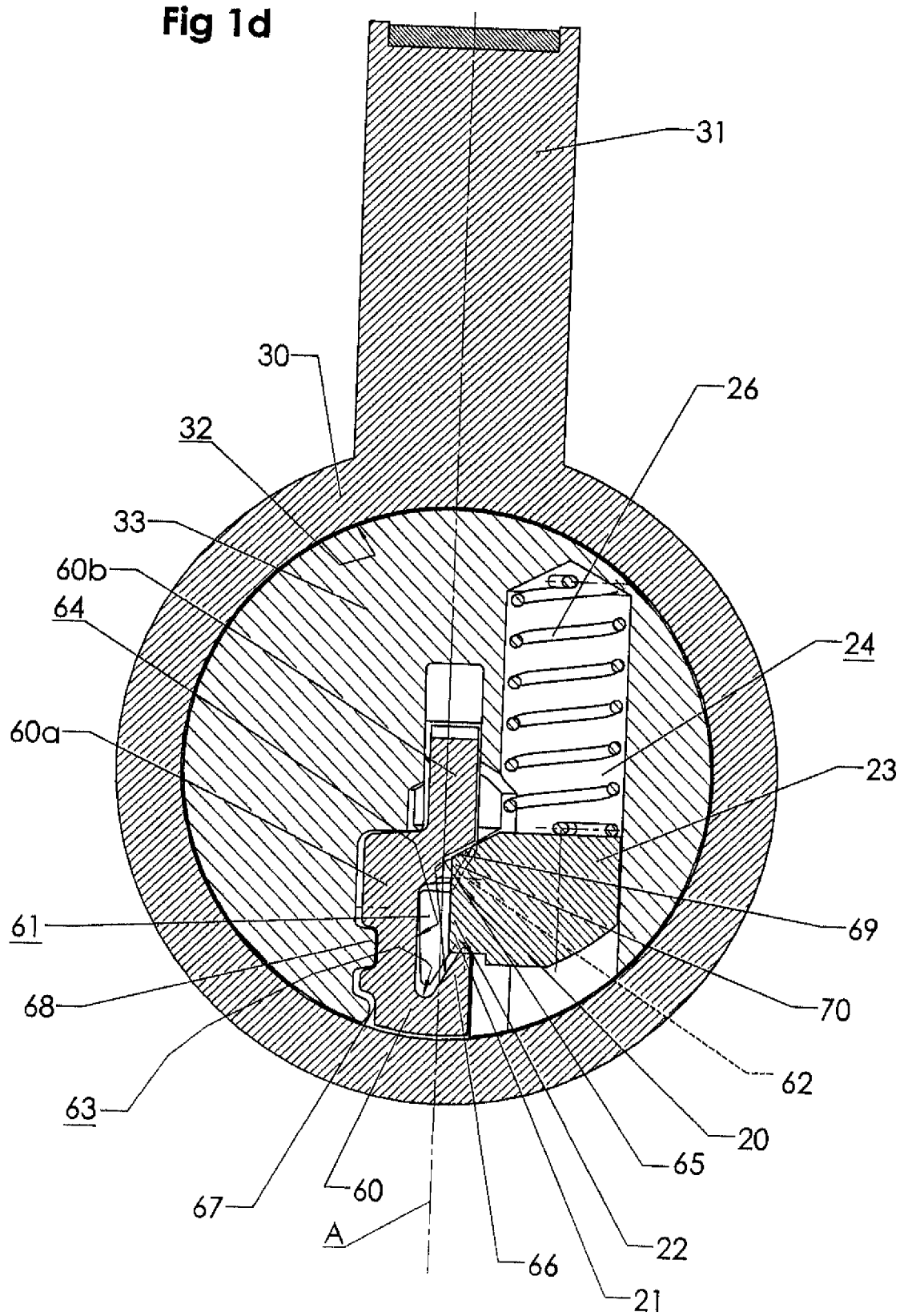


Fig 1e

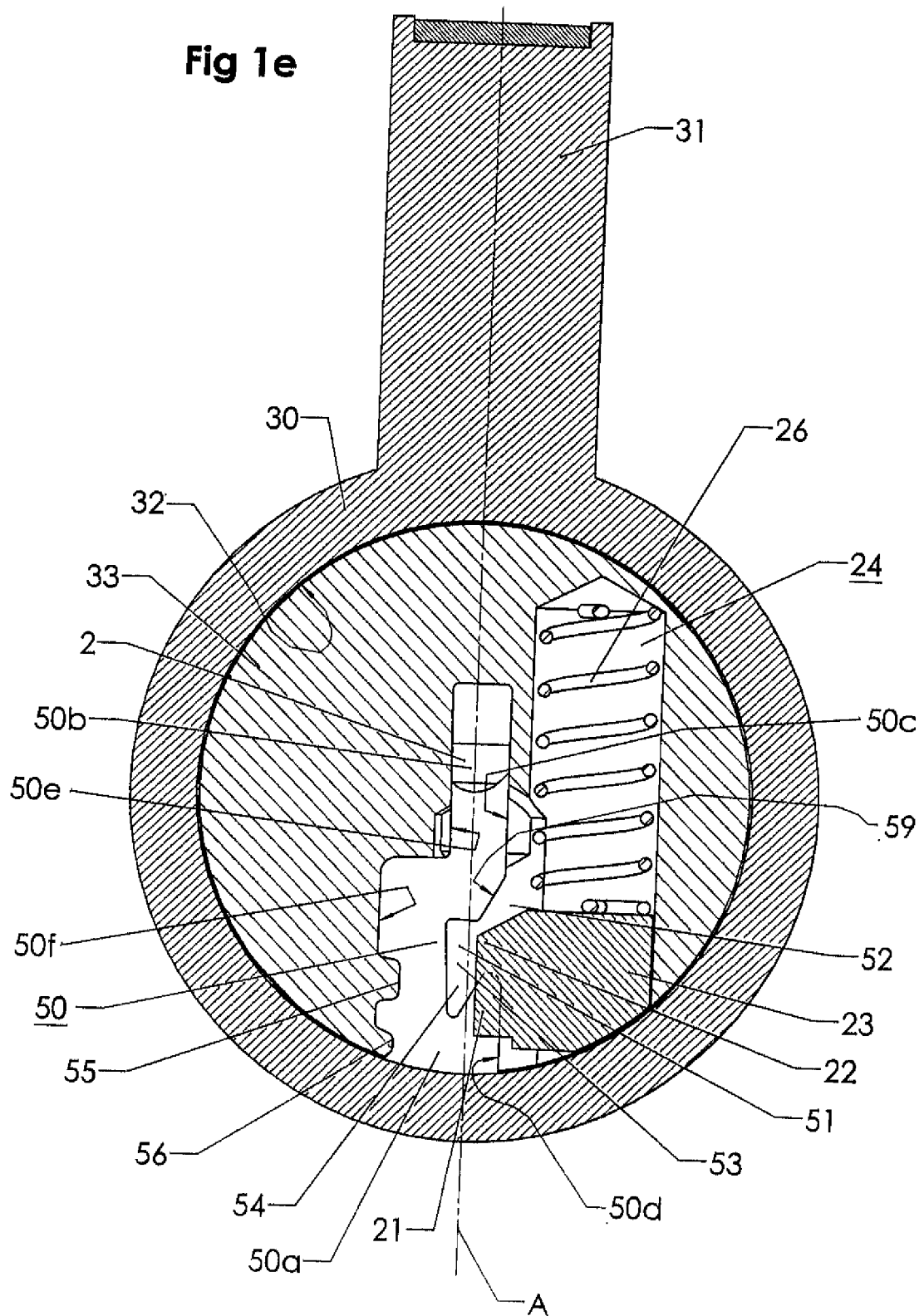


Fig 1f

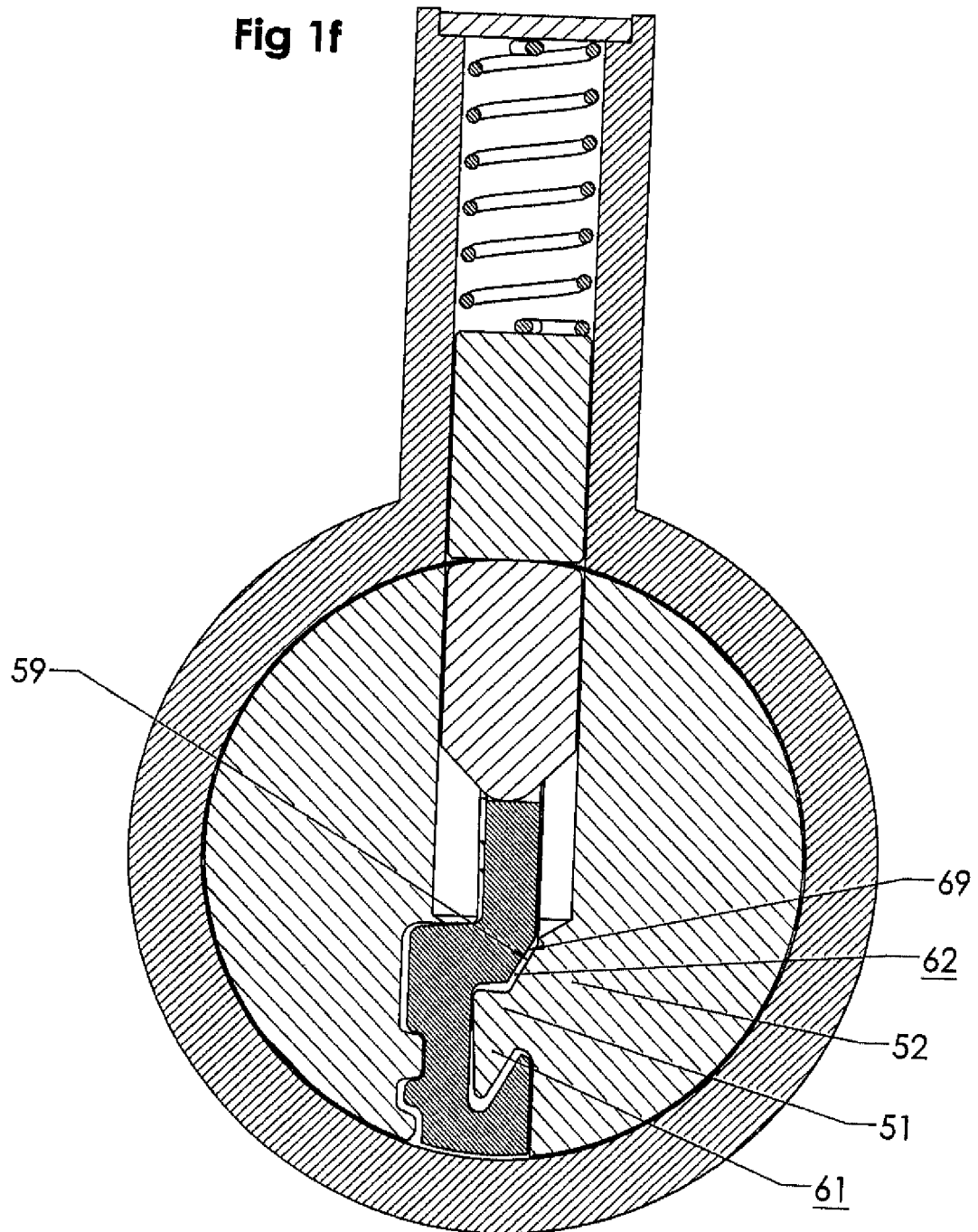


Fig 2a

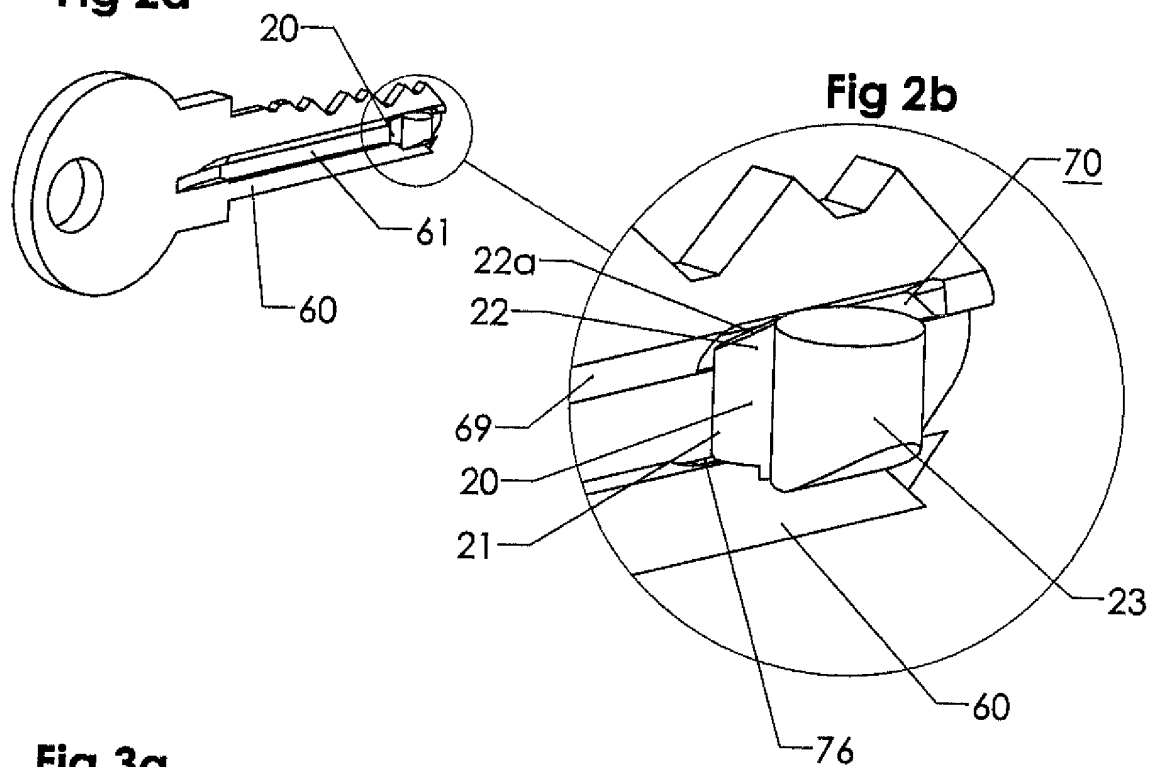
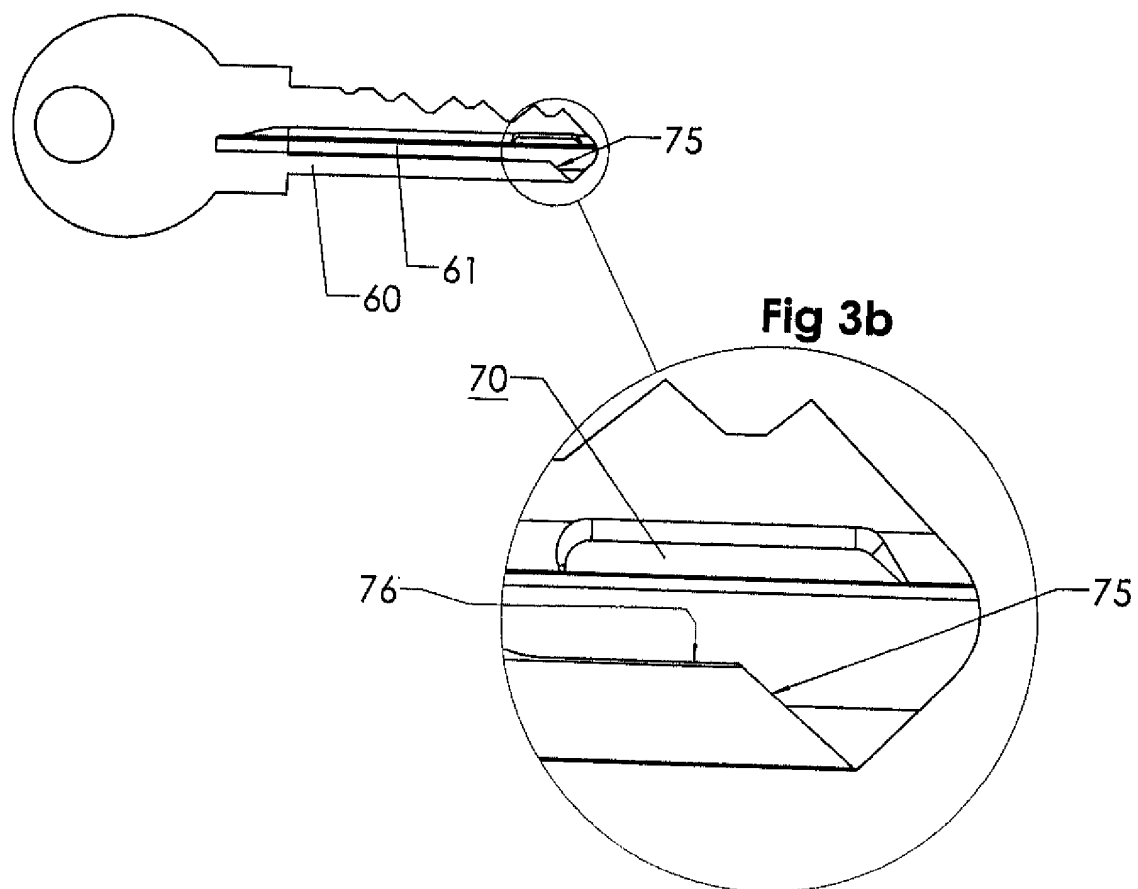
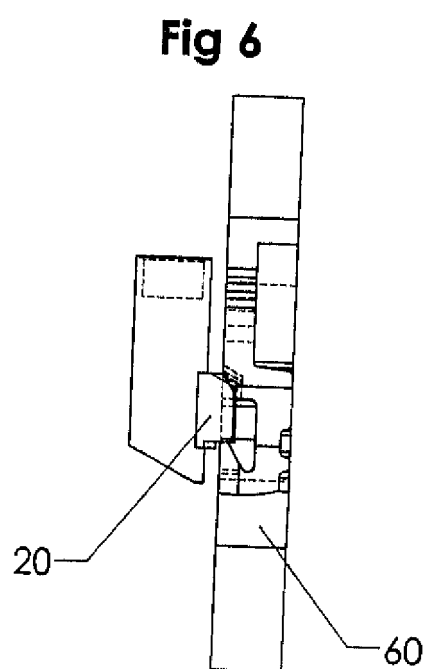
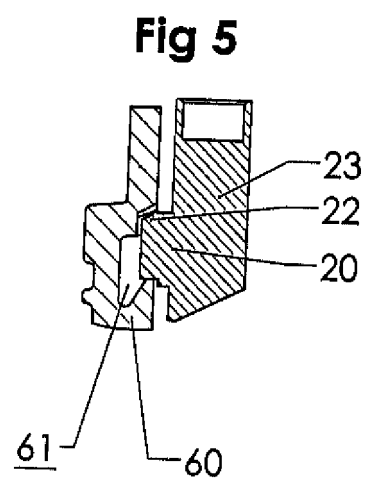
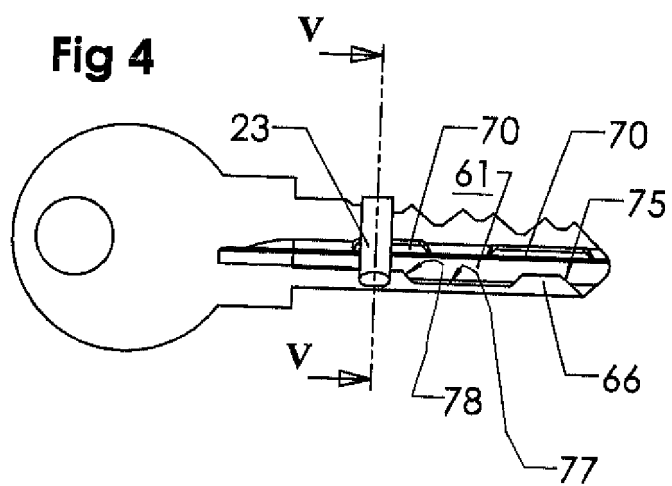


Fig 3a





REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5715717 A [0002]
- US 5845525 A [0002]
- AT 392508 B, EVVA-WERK [0003]