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(54) **LOCKING SYSTEM**

VERRIEGELUNGSSYSTEM

SYSTÈME DE VERROUILLAGE

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Description

[0001] The present invention relates to a locking system, in particular to a locking system having an improved strength.

[0002] The majority of lock barrels sold for use with PCV type doors (although they may be used with other types of door) are of the design known as "Euro cylinder" or "Euro profile" locks.

[0003] UK patent application GB2243864A, which discloses a locking system according to the preamble of claim 1, describes a lock system configured to be used with either a conventional oval cylinder or a Euro profile cylinder lock. German document DE20115832U describes a locking system comprising an adaptor block which reduces the height of the opening in the casement lock to conform to the shape of a euro profile cylinder lock, so that the lock can be used with either a Euro profile cylinder lock or a larger Swiss style lock cylinder.

[0004] Although these locks are used industry wide there are a number of disadvantages with them, in particular they are prone to snapping when subjected to particular loads. This weakness of these types of locks are well known and documented. However due to the widespread use of these cylinders there has been no fundamental change in the cylinders used although some manufacturers do provide cylinders out of materials of increased strength in attempt to overcome this problem.

[0005] The problem is inherent in the design of the Euro profile cylinder. As shown in Figure 1 the Euro profile cylinder loch 2 has a "keyhole" shaped profile that has a narrow central section 4, extending below the cam 6, that holds the two halves 8, 10 together. The strength of this central section 4 is severely compromised as a fixing hole 12 passes through it. This leaves a very small "bridge" of material above and below the fixing hole that is susceptible to snapping if a strong tool is inserted into the lock and a sharp angular movement is applied. As shown in Figure 2, which depicts a snapped euro profile cylinder lock, the actual structural thickness of the lock in this section leaves only a very small area of material 14, 16 on either side of the fixing hole 12 which compromises the overall strength of the lock. Once the cylinder loch is snapped it is a simple process for an intruder to access the interior of the lock to unlock the door.

[0006] The present invention proposes a locking system that offers improved strength.

[0007] According to the invention there is provided a locking system for a closure according to claim 1.

[0008] In this manner a locking system can be provided which can be used with a traditional euro profile cylinder, which will be understood by the skilled person to be one having the profile shown in Figure 1, but which, if required, can be adapted to take a cylinder lock having an alternative profile. In this manner non standard profiles which can be designed with greater inherent strength to overcome the problems associated with snapping of lock cylinders.

[0009] Preferably, with the at least first adaptor block located in said opening, said opening and adaptor block define an opening profile for receiving and closely surrounds a euro profile cylinder lock so as to prevent rotation thereof.

[0010] Preferably, with said at least first adaptor block removed said opening, defines an opening profile that receives and closely surrounds said alternative profile cylinder lock so as to prevent rotation thereof. In this way a lock can be provided that can at any time be upgraded from a standard euro profile lock cylinder to an improved strength lock cylinder having a different profile if higher security is required.

[0011] In a preferred embodiment the locking system may further be provided with a second adaptor block and with the second adaptor block located in said opening said opening and adaptor block define an opening profile for receiving and closely surrounding an alternative cylinder lock so as to prevent rotation thereof. In this embodiment instead of simply removing the first adaptor block to receive the non euro profile lock cylinder the first adaptor block is replaced with a second adaptor block which modifies the shape of the opening that receives the cylinder lock.

[0012] The locking system further comprises a cylinder lock. The cylinder lock comprises: a top section comprising a barrel at either end having a through passage, said barrels separated by a cam opening, two locks provided one at each end in the through passage, and a cam member located between the locks; and a lower section extending along the length of the cylinder lock and comprising a bridge section joining the barrels at either end across the cam opening.

[0013] In one arrangement the cylinder lock may comprise a euro profile cylinder lock.

[0014] In an alternative embodiment the cylinder lock comprises an alternative profile cylinder lock. As used herein the phrase "alternative profile" refers to a cylinder lock that has a profile which is not the industry standard "euro profile" as described in relation to Figure 1. The bottom section of the cylinder lock has a cross sectional area, and when said cylinder lock is an alternative, non euro profile, cylinder lock, the cross section area of the bottom section of the alternative profile cylinder lock is greater than that of a standard euro profile cylinder lock.

[0015] The alternative cylinder lock has a height which is greater than that of a standard euro profile cylinder lock. With the at least first adaptor block located in said opening the adaptor block preferably modifies the opening size to reduce its height to a first height. In this manner the opening can closely receive a euro profile cylinder lock with the adaptor in place and closely receive an alternative higher cylinder lock with the at least first adaptor block removed.

[0016] Alternatively, with the second adaptor block located in said opening the adaptor block modifies the opening size to reduce its height to a second height, said second height being greater than said first height. This

also facilitates the use of the casement lock with cylinder locks of different heights.

[0017] The top section of the alternative cylinder lock has a first width and the bottom section of the alternative cylinder lock has a second width, and the second width is substantially equal to said first width. Preferably, with the at least first adaptor block located in said opening the adaptor block modifies the opening size to reduce its width to a first width to closely conform to a euro profile cylinder. Optionally, with the second adaptor block located in said opening the second adaptor block modifies the opening size to reduce its width to a second width, said second width greater than said first width.

[0018] In a preferred arrangement the at least first adaptor block is provided with a threaded hole in its lower surface for receiving a retaining screw therein. Preferably said casement lock has a hole in a lower face thereof, and a screw passes through said hole and into said threaded hole in said at least first adaptor block so as to retain it in place. When used the second adaptor block may be retained in the same manner.

[0019] An embodiment of the invention will now be described, by way of example, with reference to the following drawings in which:

Figure 1 shows a prior art euro profile cylinder lock;

Figure 2 shows a snapped prior art euro profile cylinder lock;

Figure 3 shows a new design cylinder lock for use in the present invention;

Figure 4 shows a semi exploded view of a casement lock part of the locking system according to the present invention;

Figure 5 shows an assembled casement lock part of the locking system according to the present invention;

Figure 6 shows the locking system of the present invention configured with a euro profile cylinder lock;

Figure 7 shows a casement lock configured to receive the cylinder lock shown in Figure 3; and

Figure 8 shows the locking system of the present invention configured with the cylinder lock of Figure 3.

[0020] Figures 1 and 2 show a known lock of the euro profile cylinder according to the prior art and is described above.

[0021] Figure 3 shows an alternative non euro profile cylinder lock which has an improved resistance to snapping compared to the euro profile cylinder lock shown in Figures 1 and 2.

[0022] As can be seen, the thickness of the lower section, i.e. below the cam 106 is wider than that of the euro profile cylinder. It can also be seen that the height of the lower section, i.e. the section from the base of the locks 108 to the bottom of the cylinder lock, is greater than that of the euro profile cylinder lock depicted in Figures 1 and 2.

[0023] The effect of these differences in the cylinder lock is that at the bridge section 110 the cross sectional area of the material that must be broken to snap the lock is increased compared to that of the euro profile cylinder lock. This increased cross sectional area at the snap point increases the force necessary to snap the lock cylinder of Figure 3 thereby increasing its strength and reducing its susceptibility to destruction in the known manner. Accordingly, when used in a lock, such a cylinder lock 102 will result in increased security.

[0024] Referring to Figures 4 to 8 a locking system is shown which enables a quick change over between a euro profile cylinder, as shown in Figure 1, and the increased strength non-euro profile alternative cylinder lock 102 shown in Figure 3.

[0025] Standard euro profile cylinder locks are cheap to manufacture due to the large number of these cylinder locks that are produced and, accordingly, give a very good value solution where additional security is not required. In addition, casement locks that accept the euro profile cylinder are produced and sold in relatively high quantities which enables their production to take advantage of the benefits of mass manufacture resulting in efficient manufacture of these products.

[0026] As the improved strength cylinder locks 102 will only be required to be used in a more limited number of applications the production of these lock cylinders, and the casement locks to accept these new cylinders could not take advantage of the benefits of mass manufacture as the quantities are not great enough. The present invention proposes a solution to the problem in which a common casement lock 112 is provided with an adaptor block 114 that can be inserted and/or removed to adapt the casement lock 112 to accept either a standard euro profile lock cylinder or to accept the alternative improved strength cylinder lock 102 described above.

[0027] The casement lock 112 may be any form of known casement lock that accepts a cylinder lock therethrough. In the embodiment shown the casement lock has a primary locking means 116 which is moveable between a secured and retracted position in a first and second direction. As will be appreciated by a person skilled in the art, in use the casement lock 112 is received within a closure, for example a door, such that an edge 118 thereof is substantially flush with an edge of the closure. The primary locking means 116 interacts with some form of abutment member located in or on a frame surrounding the opening that the closure closes, for example an abutment within a door frame. The primary locking means 116 as shown in Figure 4 comprises a hook member which is rotatable about its pivot point 120 in the first and

second directions to enable it to hook around the aforementioned abutment means on the closure frame. A primary actuation means 122 is provided, the movement of which moves the primary locking means between its secured and retracted positions. As shown in Figure 4 the primary actuation means comprises a rotatable member 112. As will be appreciated by the skilled person, the member 112 is rotated by means of a square spindle which passes therethrough and attaches to a handle of the type known in the art on at least one side of the closure. A secondary locking means within the casement lock is operable to prevent movement of the primary locking means 116 in its second direction, i.e. from its secured position to its retracted position. The secondary locking means therefore prevents unlocking of the closure by preventing movement of the primary locking means. Details of the secondary locking means are not shown in Figure 4 but will be apparent to those skilled in the art and may be of any form known in the prior art. The casement lock has an opening 124 therein for receiving a cylinder lock. In use the cylinder lock selectively actuates the secondary locking means.

[0028] As shown, the locking system is also provided with an adaptor block 114 that can be received or removed from the opening 124 so as to modify the shape of the opening. The adaptor block 114 can adapt the shape of the opening so that it either conforms to the shape of the euro profile cylinder lock or so that it conforms to the shape of an alternative profile cylinder lock, for example the cylinder lock shown in Figure 3.

[0029] As can be seen, Figure 4 shows the adaptor block 114 removed from the opening 124 and Figure 5 shows the adaptor block 114 located within the opening 124. As can be seen, the adaptor block 114 modifies the shape of the opening, in particular at its lower section so that, as shown in Figure 6 the adaptor block 114 closely surrounds, and conforms to, the shape of the lower section of a euro profile cylinder 2 when a euro profile cylinder is inserted through the opening 124. By conforming to and closely surrounding the lower part of the cylinder lock 2 the adaptor block 114 prevents rotation of the cylinder lock 2.

[0030] As can be seen in Figures 7 and 8, with the adaptor block 114 removed the opening 124 receives and closely surrounds the alternative non-euro profile cylinder lock 102 so as to prevent rotation of the cylinder lock within the opening 124.

[0031] The locking system of the present invention therefore provides a casement type locking system which can be used with either a euro profile cylinder lock or alternatively with an alternative non-euro profile cylinder lock. A simple adaptor block 114 allows the casement lock 112 to be reconfigured to accept either one of these cylinder locks.

[0032] Advantageously by providing a common casement lock that can be used with either a standard euro profile cylinder lock or with the alternative non-euro profile cylinder lock described above, the benefits of mass manufacture currently enjoyed for euro profile casement locks can be maintained whilst also providing the end user with greater flexibility as to the type of lock cylinder that they can use with that casement lock, i.e. they can quickly and simply modify the casement lock by insertion or removal of the adaptor block 114 to accept either type of cylinder lock. Furthermore, by providing a casement lock which can accept different profiles of cylinder lock, if in the future the owner wishes to upgrade their standard euro profile cylinder lock to a higher security cylinder lock, this can be done without needing to change the entire door hardware thereby giving greater consumer flexibility.

[0033] The embodiments described above relate to an embodiment in which the adaptor block 114 is inserted into the opening 124 when a euro profile cylinder lock 2 is used and which is removed from the opening 124 when a non-euro profile alternative cylinder 102 is used. It will, however, be appreciated by the skilled person that two adaptor blocks 114 may be provided, one of which is shaped to adapt the shape of the opening 124 to accept and closely surround a euro profile cylinder lock and a second alternative adaptor block which may be shaped differently from the first adaptor block 114 so as to modify the shape of the opening 124 to receive and adapt a second alternative cylinder lock design, which may be the cylinder lock 102 shown in Figure 3 or may be an alternative cylinder lock design. It will also be understood by the skilled person that the exact shape of the cross section of the improved cylinder lock design 102 used for the invention is not limited to the shape of the cylinder lock 102 shown in Figure 3 and that other designs may be used providing that the cross sectional area where the fixing hole 12 passes through the lower section of the cylinder lock is greater than that of the standard euro profile cylinder lock.

Claims

1. A locking system for a closure, the system comprising:

a casement lock (112) comprising:

a primary locking means (116) moveable between secured and retracted positions in respective first and second directions;
primary actuation means (122) for selective movement of the primary locking means (116) in the first and second directions;
secondary locking means selectively operable to prevent movement of the primary locking means in the second direction;
the casement lock (112) further comprising an opening (124) therein for receiving a cylinder lock (102) therethrough for selectively actuating the secondary locking means;

and

a cylinder lock (2, 102) comprising:

a first section comprising a barrel having a through passage at either end, said barrel separated by a cam opening;
a lock (108) provided at each end in the through passages, and a cam member (106) located between the locks; and
a bridging section (110) extending along the length of the cylinder lock and joining the barrels across the cam opening; and

wherein the width of the opening (124) adjacent the first section is substantially equal to the width of the opening adjacent the bridging section (110); and
wherein the locking system is further provided with at least a first adaptor block (114) receivable and removable in said opening (124) to modify the opening size such that with the adaptor block (114) in situ the shape of the opening (124) substantially conforms to the shape of a euro profile cylinder lock (2);
and **characterised in that**
said first adaptor block (114) modifies the opening size to reduce its height to a first height.

2. A locking system according to claim 1 wherein, with said at least first adaptor block (114) removed, said opening (124) defines an opening that closely surrounds an alternative profile cylinder lock (102) so as to prevent rotation thereof.

3. A locking system according to claim 1 wherein the locking system is further provided with a second adaptor block and wherein, with the second adaptor block located in said opening (124), said opening (124) and second adaptor block define an opening configured for receiving and closely surrounding an alternative cylinder lock so as to prevent rotation thereof.

4. A locking system according to claim 3 wherein, with the second adaptor block located in said opening (124), the second adaptor block modifies the opening size to reduce its height to a second height, said second height being greater than said first height.

5. A locking system according to claim 1 wherein, with the at least first adaptor block (114) located in said opening (124), the adaptor block (114) modifies the opening size to reduce its width to a first width.

6. A locking system according to claim 5 wherein, with the second adaptor block located in said opening (124) the second adaptor block modifies the opening size to reduce its width to a second width, said second width greater than said first width.

7. A locking system according to any preceding claim wherein the at least first adaptor block (114) is provided with a threaded hole in its lower surface for receiving a retaining screw therein.

8. A locking system according to claim 7 wherein said casement lock has a hole therein, and a screw that passes through said hole and into said at least first adaptor block so as to retain it in place.

Patentansprüche

1. Verriegelungssystem für einen Verschluss, wobei das System Folgendes umfasst:
ein Fensterflügelschloss (112), das Folgendes umfasst:

ein primäres Verriegelungsmittel (116), das zwischen einer gesicherten und einer eingezogenen Stellung in einer jeweiligen ersten beziehungsweise zweiten Richtung beweglich ist,
primäre Betätigungsmittel (122) zur selektiven Bewegung des primären Verriegelungsmittels (116) in der ersten und der zweiten Richtung,
sekundäre Verriegelungsmittel, die selektiv betätigt werden können, um eine Bewegung des primären Verriegelungsmittels in der zweiten Richtung zu verhindern,
wobei das Fensterflügelschloss (112) ferner eine Öffnung (124) in demselben zum Aufnehmen eines Zylinderschlosses (102) durch dieselbe zum selektiven Betätigen der sekundären Verriegelungsmittel umfasst, und
ein Zylinderschloss (2, 102), das Folgendes umfasst:

eine erste Sektion, die einen Zylinder umfasst, der einen Durchgang an jedem Ende aufweist, wobei der Zylinder durch eine Nockenöffnung getrennt ist,
ein Schloss (108), das an jedem Ende in den Durchgängen bereitgestellt wird, und ein Nockenelement (106), das zwischen den Schlössern angeordnet ist, und
eine Überbrückungssektion (110), die sich entlang der Länge des Zylinderschlosses erstreckt und die Zylinder über die Nockenöffnung verbindet, und
wobei die Breite der Öffnung (124) angrenzend an die erste Sektion im Wesentlichen gleich der Breite der Öffnung angrenzend an die Überbrückungssektion (110) ist und wobei das Verriegelungssystem ferner mit wenigstens einem ersten Adapterblock

(114) versehen ist, der in der Öffnung (124) aufgenommen und aus ihr entfernt werden kann, um die Öffnungsgröße derart zu modifizieren, dass mit dem Adapterblock (114) vor Ort sich die Form der Öffnung (124) im Wesentlichen an die Form eines Europrofil-Zylinderschlosses (2) anpasst,
und **dadurch gekennzeichnet, dass**
der erste Adapterblock (114) die Öffnungsgröße modifiziert, um ihre Höhe auf eine erste Höhe zu verringern.

2. Verriegelungssystem nach Anspruch 1, wobei, wenn der wenigstens erste Adapterblock (114) entfernt ist, die Öffnung (124) eine Öffnung definiert, die ein Zylinderschloss (102) mit alternativem Profil eng umschließt, um so eine Drehung desselben zu verhindern.

3. Verriegelungssystem nach Anspruch 1, wobei das Verriegelungssystem ferner mit einem zweiten Adapterblock versehen ist und wobei, wenn der zweite Adapterblock in der Öffnung (124) angeordnet ist, die Öffnung (124) und der zweite Adapterblock eine Öffnung definieren, die konfiguriert ist zum Aufnehmen und engen Umschließen eines alternativen Zylinderschlosses, um so eine Drehung desselben zu verhindern.

4. Verriegelungssystem nach Anspruch 3, wobei, wenn der zweite Adapterblock in der Öffnung (124) angeordnet ist, der zweite Adapterblock die Öffnungsgröße modifiziert, um ihre Höhe auf eine zweite Höhe zu verringern, wobei die zweite Höhe größer ist als die erste Höhe.

5. Verriegelungssystem nach Anspruch 1, wobei, wenn der wenigstens erste Adapterblock (114) in der Öffnung (124) angeordnet ist, der Adapterblock (114) die Öffnungsgröße modifiziert, um ihre Breite auf eine erste Breite zu verringern.

6. Verriegelungssystem nach Anspruch 5, wobei, wenn der zweite Adapterblock in der Öffnung (124) angeordnet ist, der zweite Adapterblock die Öffnungsgröße modifiziert, um ihre Breite auf eine zweite Breite zu verringern, wobei die zweite Breite größer ist als die erste Breite.

7. Verriegelungssystem nach einem der vorhergehenden Ansprüche, wobei der wenigstens erste Adapterblock (114) mit einem Gewindeloch in seiner unteren Fläche zum Aufnehmen einer Halteschraube in demselben versehen ist.

8. Verriegelungssystem nach Anspruch 7, wobei das Fensterflügelschloss ein Loch in demselben und eine Schraube, die durch das Loch und in den wenigstens ersten Adapterblock hindurchgeht, um ihn an seinem Platz zu halten, aufweist.

Revendications

1. Système de verrouillage pour une fermeture, le système comprenant :
une serrure à tourniquet (112), comprenant :

un moyen de verrouillage primaire (116) pouvant être déplacé entre des positions fixée et rétractée dans des première et deuxième directions respectives ;
des moyens d'actionnement primaires (122) pour assurer un déplacement sélectif du moyen de verrouillage primaire (116) dans les première et deuxième directions ;
des moyens de verrouillage secondaires pouvant être actionnés sélectivement pour empêcher le déplacement du moyen de verrouillage primaire dans la deuxième direction ;
la serrure à tourniquet (112) comprenant en outre une ouverture (124) pour recevoir une serrure à cylindre (102) à travers celle-ci pour actionner sélectivement les moyens de verrouillage secondaires ; et
une serrure à cylindre (2, 102), comprenant :

une première section comprenant un barillet comportant un passage de traversée au niveau de chaque extrémité, ledit barillet étant séparé par une ouverture de came ;
une serrure (108) agencée au niveau de chaque extrémité dans les passages de traversée, et un élément de came (106) agencé entre les serrures ; et
une section de liaison (110) s'étendant le long de la longueur de la serrure à cylindre et reliant les barillets à travers l'ouverture de came ; et
dans lequel la largeur de l'ouverture (124) adjacente à la première section est sensiblement égale à la largeur de l'ouverture adjacente à la section de liaison (110) ; et dans lequel le système de verrouillage comporte en outre au moins un premier bloc d'adaptation (114) pouvant être reçu dans ladite ouverture (124) et retiré de celle-ci, pour modifier la taille de l'ouverture, de sorte que lorsque le bloc d'adaptation (114) est en place, la forme de l'ouverture (124) se conforme sensiblement à la forme d'une serrure à cylindre à profil européen (2) ;
et **caractérisé en ce que** :
ledit premier bloc d'adaptation (114) modifie la taille de l'ouverture pour réduire sa hauteur à une première hauteur.

2. Système de verrouillage selon la revendication 1, dans lequel, lorsque ledit au moins un bloc d'adaptation (114) est retiré, ladite ouverture (124) définit une ouverture entourant étroitement une serrure à cylindre à profil alternatif (102), de sorte à empêcher sa rotation.

3. Système de verrouillage selon la revendication 1, dans lequel le système de verrouillage comporte en outre un deuxième bloc d'adaptation et dans lequel, lorsque le deuxième bloc d'adaptation est agencé dans ladite ouverture (124), ladite ouverture (124) et le deuxième bloc d'adaptation définissent une ouverture configurée pour recevoir et entourer étroitement une serrure à cylindre alternative, de sorte à empêcher sa rotation.

4. Système de verrouillage selon la revendication 3, dans lequel, lorsque le deuxième bloc d'adaptation est agencé dans ladite ouverture (124), le deuxième bloc d'adaptation modifie la taille de l'ouverture, de sorte à réduire sa hauteur à une deuxième hauteur, ladite deuxième hauteur étant supérieure à ladite première hauteur.

5. Système de verrouillage selon la revendication 1, dans lequel, lorsque le au moins premier bloc d'adaptation (114) est agencé dans ladite ouverture (124), le bloc d'adaptation (114) modifie la taille de l'ouverture, de sorte à réduire sa largeur à une première largeur.

6. Système de verrouillage selon la revendication 5, dans lequel, lorsque le deuxième bloc d'adaptation est agencé dans ladite ouverture (124), le deuxième bloc d'adaptation modifie la taille de l'ouverture de sorte à réduire sa largeur à une deuxième largeur, ladite deuxième largeur étant supérieure à ladite première largeur.

7. Système de verrouillage selon l'une quelconque des revendications précédentes, dans lequel le au moins premier bloc d'adaptation (114) comporte un trou fileté dans sa surface inférieure pour y recevoir une vis de retenue.

8. Système de verrouillage selon la revendication 7, dans lequel ladite serrure à tourniquet comporte un trou et une vis passant à travers ledit trou et dans ledit au moins premier bloc d'adaptation, de sorte à le retenir dans sa position.

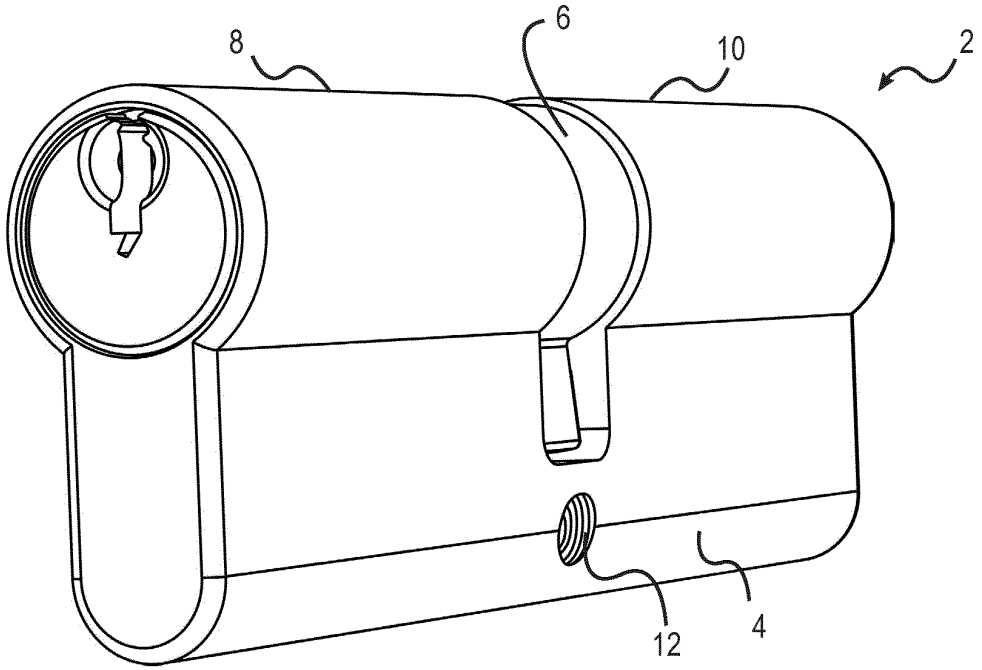


Fig 1

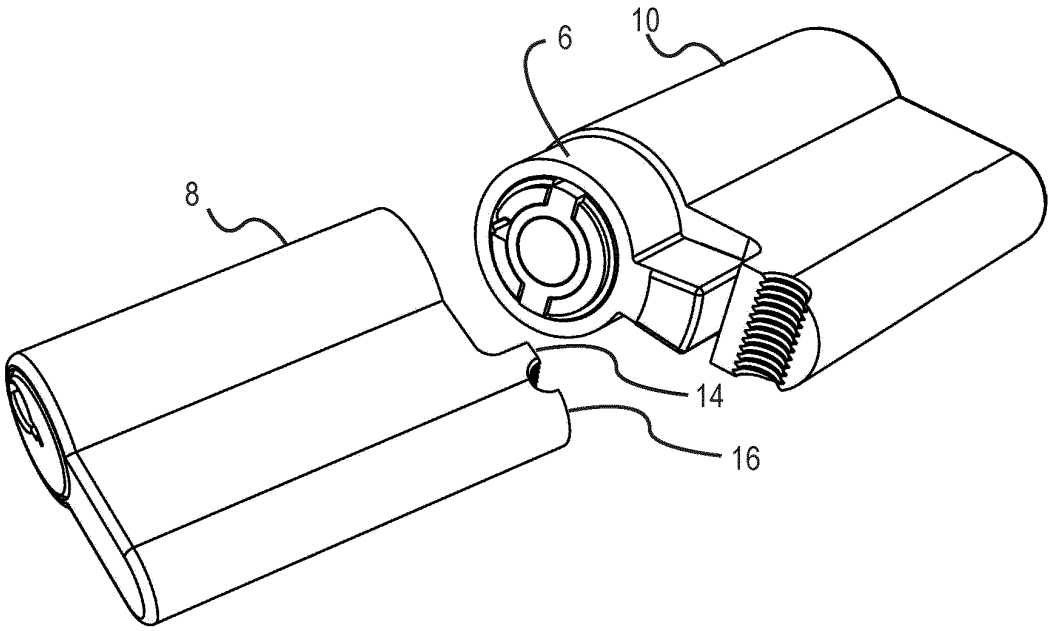


Fig 2

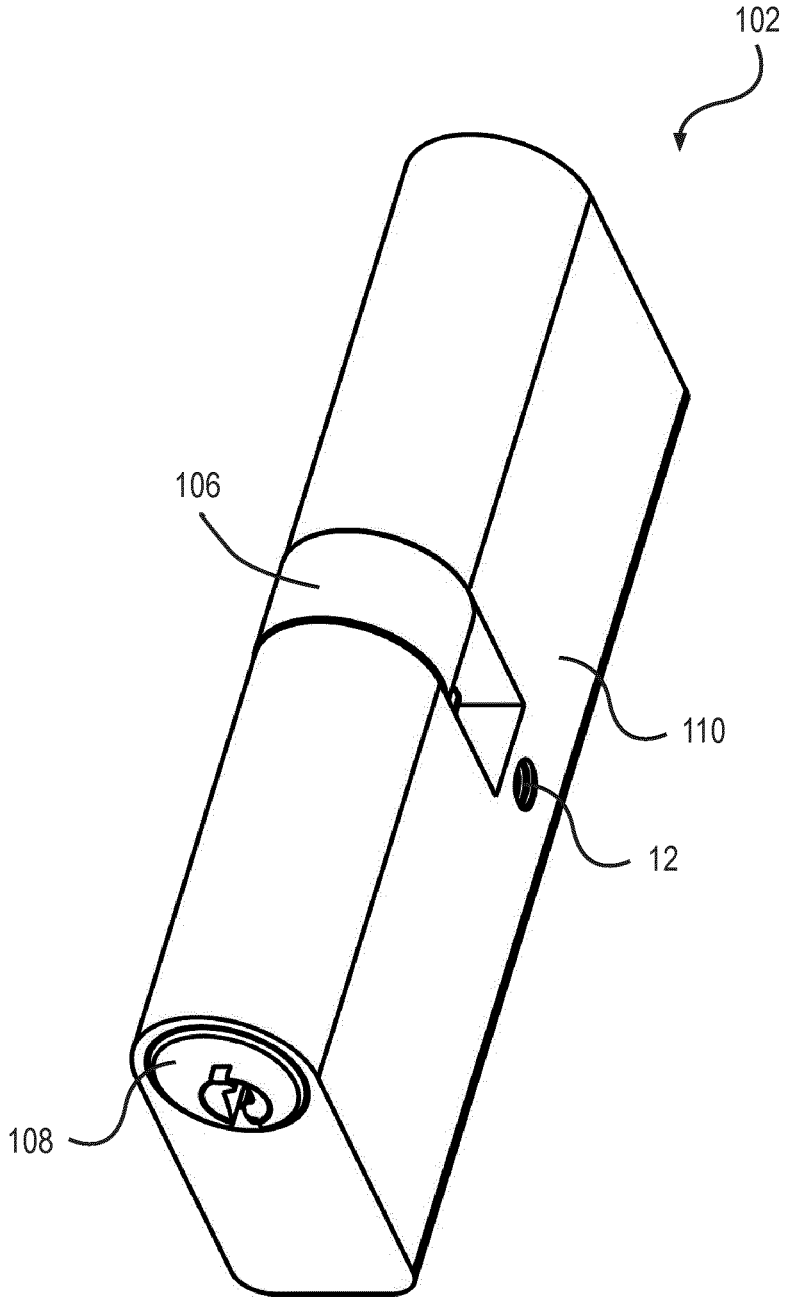


Fig 3

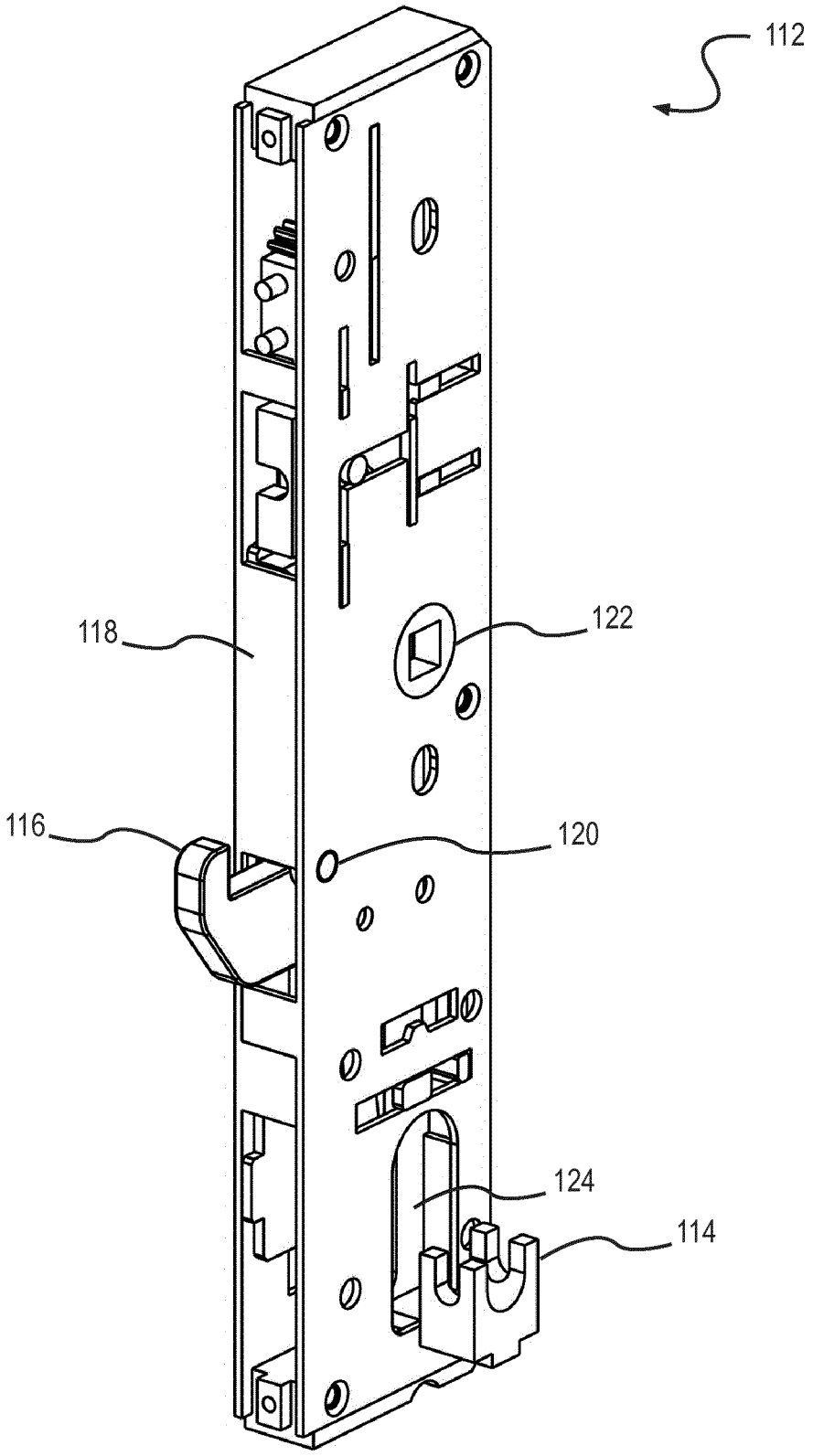


Fig 4

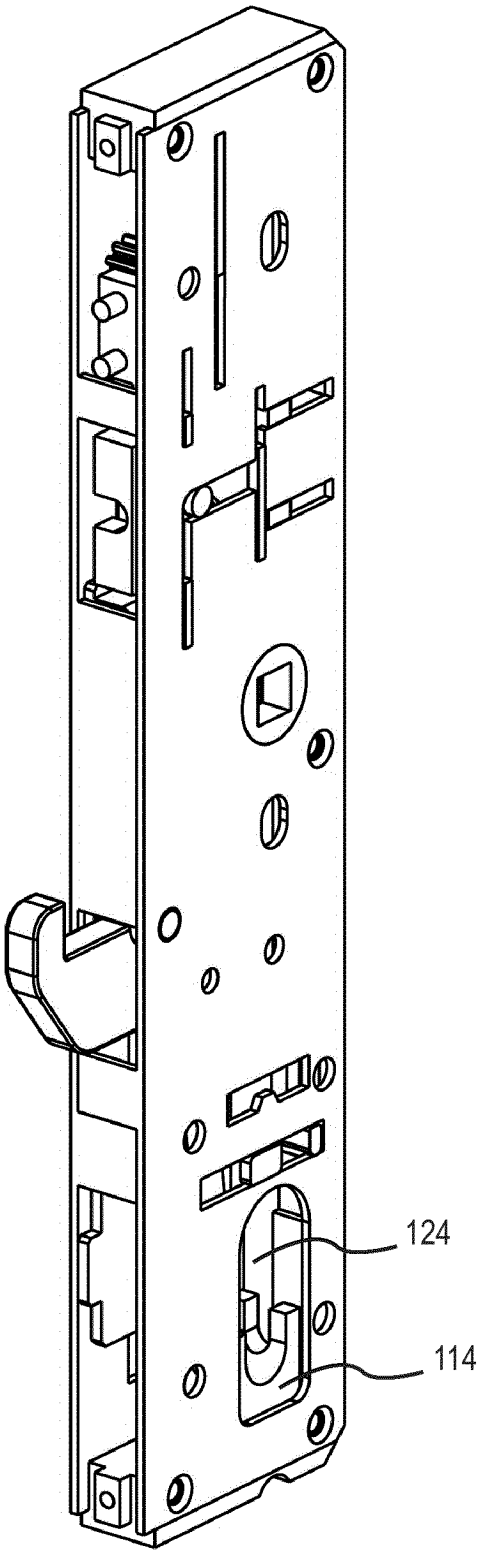


Fig 5

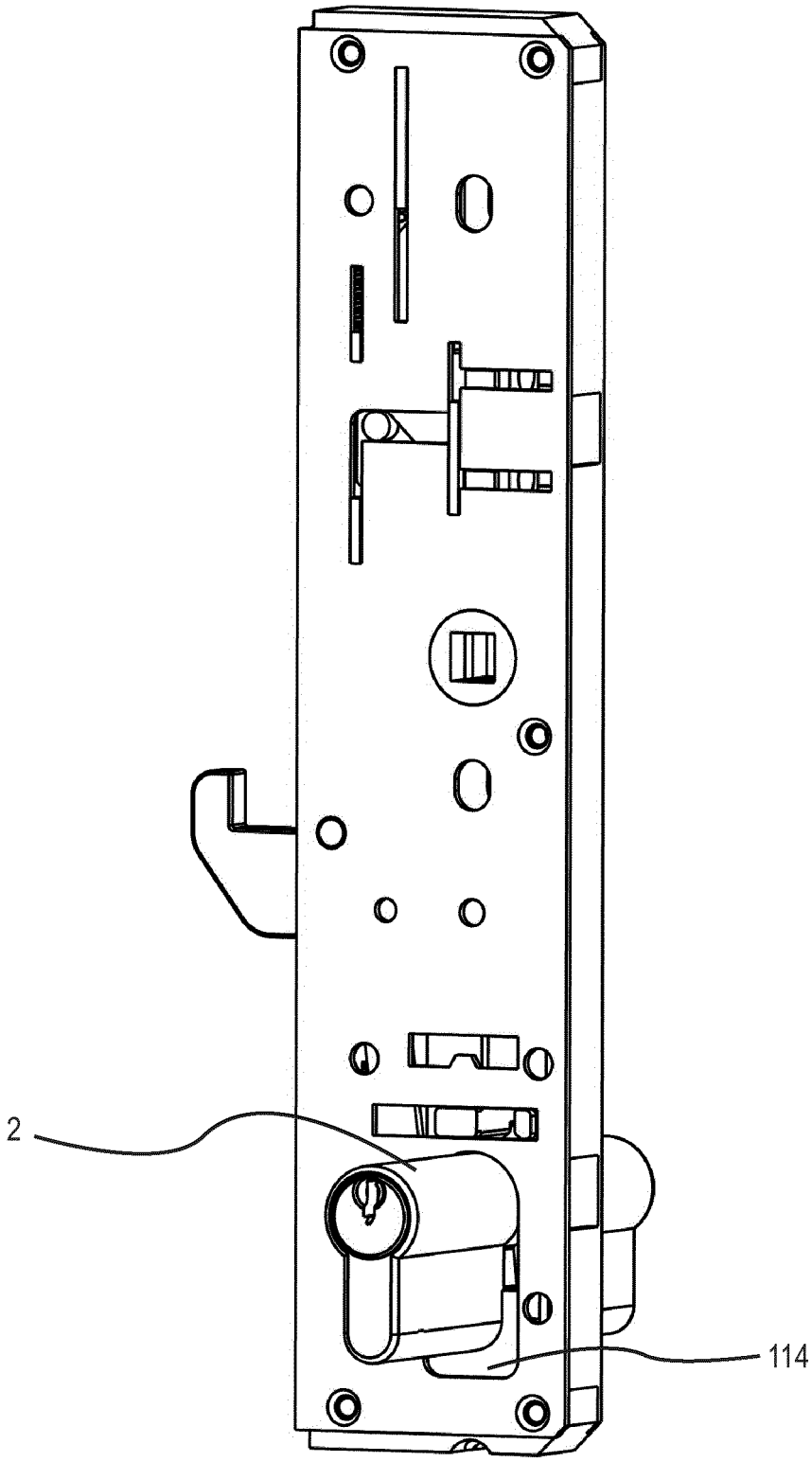


Fig 6

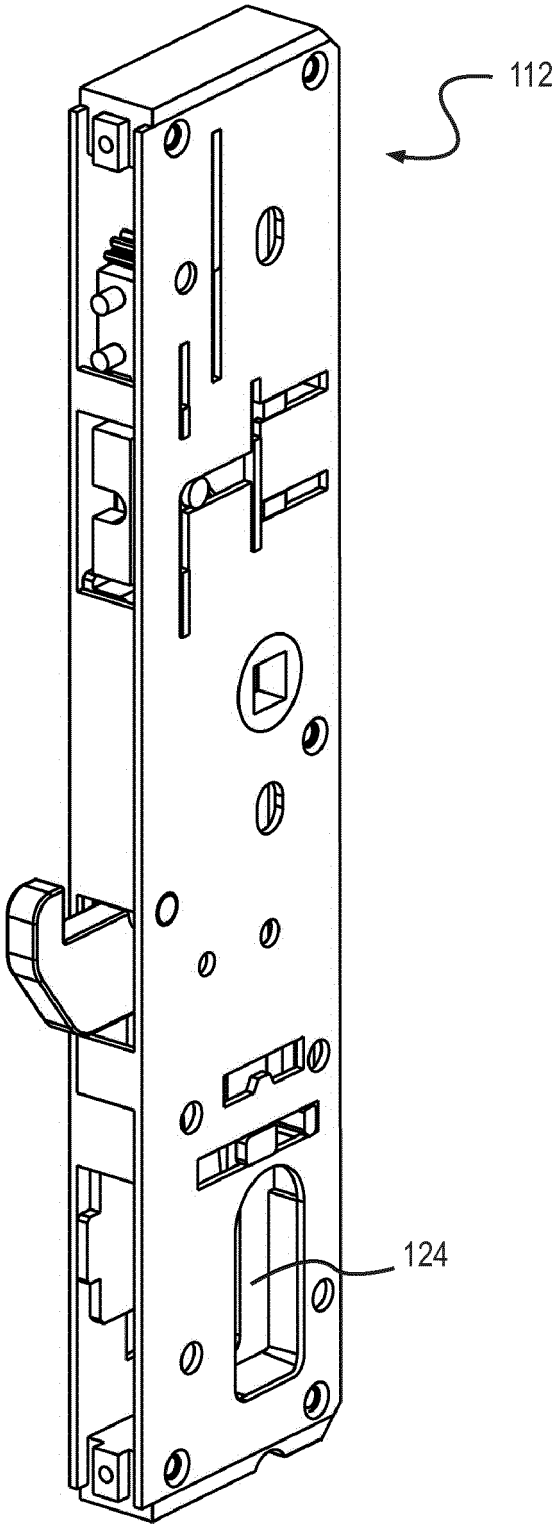


Fig 7

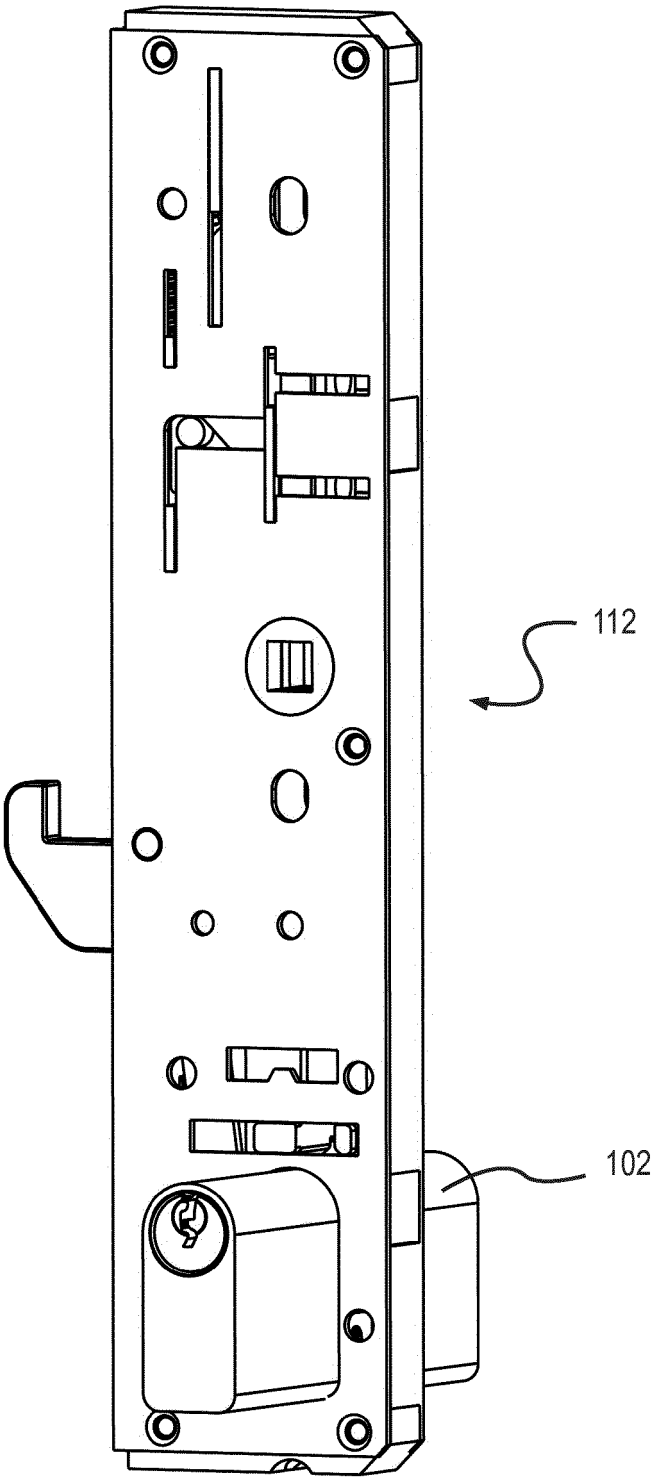


Fig 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- DE 20115832 U **[0003]**