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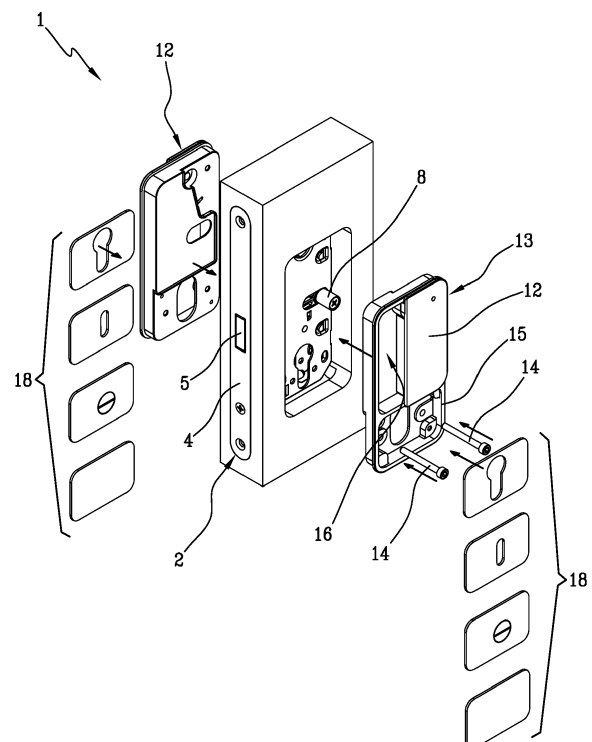
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(54) **CLOSURE SYSTEM FOR A LEAF OF A WINDOW OR DOOR**

(57) Closure system for a leaf of a window or door, comprising a lock-body (2) applicable to a leaf (100), a closing bar (5) movable between an extracted configuration from the lock-body (2) and a retracted configuration in the lock-body (2), and at least one command member (12) manually activatable by a user and kinematically connected or connectable to the closing bar (5), said command member (12) being manually subjectable to a thrust or traction force in order to assume at least two operating positions, corresponding to the extracted configuration and the retracted configuration of the closing bar (5), respectively, wherein the command member (12) acts directly on the closing bar (5) by means of at least one manoeuvring element (8) directly applied to the command member (12) or to the closing bar (5).

Fig.5



Description

[0001] The present invention relates to a closure system for a leaf of a window or door, in particular a closure system that is configured as a "flush" handle system.

[0002] Leaves for windows or doors are currently equipped with closure systems of the rotary handle type, in which the lowering movement of the handle determines the release of the opening of the leaf.

[0003] In known systems, the handle is directly mounted on the lock, generally by means of a pin with a polygonal (square) section of the handle that is inserted into a square hole in the lock. Such pin-hole coupling determines at the same time both the support of the handle and the transmission to the lock of the rotary movement impressed on the handle.

[0004] Disadvantageously such closure systems, inextricably connected to the rotary movement, have minimal dimensions determined by the dimension of the handle, measured away from the main surface of the leaf. Such dimensions cannot be reduced beyond a physical limit imposed by the fact the handle must be able to be grasped conveniently and safely.

[0005] In light of the problems disclosed above, the aim of the present invention is to make available a closure system for a leaf of a window or door that overcomes the drawbacks of the prior art mentioned above.

[0006] In particular, it is an object of the present invention to provide a closure system for a leaf of a window or door that has notably reduced dimensions.

[0007] The specified object is fully achieved by a closure system for a leaf of a window or door according to the present invention, which is characterised by what is contained in the claims set forth below.

[0008] The technical characteristics of the invention, according to the aforementioned object, can be clearly seen from the contents of the claims set forth below, and the advantages thereof will more fully emerge from the detailed description which follows, made with reference to the accompanying drawings, which represent a purely exemplary and nonlimiting embodiment thereof, wherein:

- figure 1 illustrates a view of a mounting step of a closure system according to the invention and in a first embodiment;
- figure 2 shows a subsequent mounting step of the closure system of figure 1;
- figure 3 shows a view from above of the system according to the invention corresponding to the mounting step of figure 1;
- figures 4A and 4B show two sectional views of the system of figure 1 corresponding to two mounting sub-steps corresponding to the mounting step of figure 2;
- figure 4C represents an enlarged view of a detail of figure 4B;
- figure 5 represents an exploded view of a complete closure system according to the invention and in

compliance with the embodiment of figure 1;

- figure 6 is a sectional view of a further mounting step of the system of figure 5;
- figure 7 corresponds to the view of figure 6 in the already mounted step;
- figure 8 represents the system of figure 5 with the mounting fully completed;
- figures 9-12 represent side and sectional views of the system of figure 5, in a first sub-variant of embodiment, respectively in the closing position and the opening position;
- figures 13-16 represent side and sectional views of the system of figure 5, in a second sub-variant of embodiment, in the closing position and in the opening position, respectively;
- figure 17 illustrates a view of a mounting step of a closure system according to the invention and in a second embodiment;
- figure 18 represents a sectional view of a mounting step of the system of figure 17;
- figure 19 represents an exploded view corresponding to the view of figure 18;
- figure 20 corresponds to the view of figure 18 in the already mounted step;
- figure 20A represents an enlarged view of a detail of figure 20;
- figures 21-24 represent variant embodiments of a closure system in accordance with the present invention.

[0009] The present invention relates, with reference to figures 1-16, to a first embodiment of a closure system for a leaf of a window or door according to the present invention.

[0010] The system 1 comprises a lock-body 2 applicable to a leaf 100 of a window or door (only one part of which can be seen in the figures), in particular inside a respective containing seat 110 accessible at least through a front opening 120, arranged on a front edge 130 of the leaf 100 to enable an insertion of the lock-body 2 into the containing seat 110, and by at least one lateral opening 140 arranged on a larger surface 150 of the leaf 100, as can be seen in figure 3.

[0011] The following description will refer to a leaf 100 having two opposing lateral openings 140 facing the same containing seat 110, however according to embodiments not illustrated it is possible to envisage only one lateral opening 110, in particular for windows and doors that can be activated or accessed from one side only.

[0012] In accordance with a general substantially well-known conformation, the lock-body 2 has a containing shell 3 and a front panel 4 fixed to the containing shell 3 and defining a front abutment of the lock-body 2 on the front wall 130 of the leaf 100.

[0013] The containing shell 3 can be advantageously made of two half-shells stably fixed to each other, for example to facilitate the assembly operations of the lock-body 2.

[0014] A closing bar 5, or "spring latch" is associated with the lock-body 2, movable between an at least partially extracted configuration from the lock-body 2 and a retracted configuration in the lock-body 2 (the latter visible in figure 1). Such movement of the closing bar 5 is preferably a translation along a rectilinear direction and in particular horizontal.

[0015] The closing bar 5 can be made in any form as long as it is able to perform the known function of locking and unlocking the leaf 100 during opening. In the embodiment illustrated, the closing bar 5 has a rectangular cross section oriented vertically.

[0016] Advantageously, the closing bar 5 has on its opposing lateral surfaces respective receiving portions 6 provided with a through hole 7. Such receiving portions 6, in the quantity of one per side, are intended for the application of respective manoeuvring elements 8 (in the form of cylindrical or different shaped pins), preferably by means of a single threaded element 9 (figure 2) that engages both the manoeuvring elements 8 so as to have a central portion thereof inserted into the through hole 7 (figures 4A-4C). Preferably, at least one of the pins 8 is internally threaded and the threaded element 9 has a threaded stem in at least one of its ends opposite the head so as to be screwed into the pin 8 opposite the one in which the head of the threaded element 9 is engaged.

[0017] It follows that each manoeuvring element 8, or pin, is directly applied to the closing bar 5 fixed thereto so as to be integral therewith.

[0018] On each side corresponding to the receiving portions 6, the lock-body 2 (and in particular the containing shell 3) has respective slots 10 having an elongate shape along a horizontal direction or however parallel to the movement direction of the closing bar 5, inside which a respective receiving portion 6 and/or a respective manoeuvring element 8 is slidably arranged so that the extension of the sliding movement of the receiving portion 6 and/or of the manoeuvring element 8 in the slot 10 determines (or at least includes) the maximum limit of the movement of the closing bar 5 between the extracted and retracted positions.

[0019] Preferably, the closing bar 5 is subjected to an opposing element (not illustrated) configured to maintain the closing bar 5 pressed towards the extracted position. In this way, an automatic closure of the lock can take place.

[0020] In the specific embodiment of figures 1-16 the slot 10 receives inside it a respective receiving portion 6 having a cylindrical conformation like a bushing, for example defined by a protrusion of the closing bar 5 or by another component fixed thereto, while the manoeuvring element 8 applied to the receiving portion 6 is arranged in an axially external position to the slot 10. However, in accordance with embodiments not illustrated, the receiving portion 6 could have a shorter or null length so as not to be inserted into the slot 10 and in that case the manoeuvring element 8 would be slidably inserted into the slot 10 itself.

[0021] The length of the manoeuvring elements 8 is advantageously selected as a function of the thickness of the leaf 100, in particular as the thickness of the leaf increases manoeuvring elements 8 with a longer axial length need to be used.

[0022] The lock-body 2 can also have an opening 11 for a cylinder, made in the containing shell 3 and suitable for the insertion (transversal with respect to the movement direction of the closing bar 5) of a cylinder, for example of the standard type, in the case of a lock that can be opened with a key.

[0023] The system 1 according to the invention further comprises, for each manoeuvring element 8, a respective command member 12 that can be manually activated (by grasping or direct thrust) by a user and kinematically connected or connectable to the closing bar 5 for placing the closing bar 5 in movement.

[0024] In particular, the command member 12 is manually subjectable to a thrust or traction force in order to assume at least two operating positions, corresponding to the extracted configuration and the retracted configuration of the closing bar 5, respectively.

[0025] In more detail, a lateral plate 13 can be applied to each lateral opening 140, on which the respective command member 12 is arranged or mounted.

[0026] The lateral plate 13 preferably has a peripheral profile counter-shaped to the lateral opening 140 and preferably quadrangular and has a configuration such as to be substantially flush with the largest surface 150 of the leaf 100 in a mounting configuration on the leaf 100.

[0027] The lateral plate 13 can be stably and reversibly fixed to the lock-body 2 (when the latter is inserted in the containing seat 110) and/or to the leaf 100. In the preferred and illustrated embodiment (figures 5 and 6), the lateral plate 13 is stably fixed to the lock-body 2 through threaded members 14. Preferably, with the same threaded members 14 both the lateral plates 13 can be simultaneously fixed, in particular by appropriately choosing the length of the threaded members 14.

[0028] As can be seen in detail in figures 5-8, the lateral plate 13 has a perimeter frame 15 counter-shaped to the lateral opening 140 and defining a through opening 14 on which the command member 12 is mounted.

[0029] In this way, once the plate 13 is applied to the leaf 100, the command member 12 faces a corresponding lateral portion of the lock-body 2 so as to be able to act on the manoeuvring element 8.

[0030] Entering into more detail, the command member 12 has an engagement portion configured to intercept the corresponding manoeuvring element 8 so as to draw in movement the closing bar 5 at least from the extracted position to the retracted position.

[0031] The engagement portion 17 preferably comprises a wall arranged on a rear zone of the command member 12, opposite a normally visible portion of the command member 12.

[0032] As can be seen in figures 5-18, the command member 12 is plate-shaped lying perpendicular to a lon-

gitudinal axis of the manoeuvring elements 8, i.e. parallel to the largest surface 150 of the leaf 100. In this way it is possible to contain the dimensions of the command member 12 in the transversal direction to the leaf 100.

[0033] Advantageously, the command member 12 is mounted on the lateral plate 13 and in particular on the perimeter frame 15, so as to have at least one movement component along the movement direction of the closing bar 5.

[0034] In particular, in the embodiment of figures 9-12 the command member 12 is in the form of a slider that slides along a translation direction parallel to the translation direction of the closing bar 5, while in the embodiment of figures 13-16 the command member 12 is in the form of a lever (plate-shaped) hinged in an eccentric portion with respect to the corresponding pin 8, and in particular a hinging portion arranged above the pin 8.

[0035] In order to guarantee a correct action of the command member 12 on the respective pin 8, the engagement portion 17 of the command member 12 has an extension direction that is maintained transversal to the movement direction of the closing bar 5 along the whole stroke of the closing bar 5 between the extracted and retracted positions. Preferably, the engagement portion 17 is defined by a vertical rectilinear wall in the embodiment of figures 13-16 and by a rectilinear wall that is maintained vertical at least in a non-operating configuration of the command member 12 in the embodiment of figures 9-12 (figure 9 shows the non-operating configuration).

[0036] In light of what has been described, the engagement between each manoeuvring element 8 or pin and the corresponding command member 12 is a direct contact or sliding contact relationship. It therefore follows, according to a particularly advantageous aspect of the invention, that the command member 12 acts directly on each manoeuvring element 8, i.e. through direct contact without the interposition of further elements (levers, kinematic mechanisms, returns or the like).

[0037] It also follows that the command member 12 (and in particular the lateral plate 13) is applied or applicable to the leaf 100 and/or to the lock-body 2 exclusively through fastening means (threaded members 14) that is distinct with respect to an operating coupling between the command member 12 and the manoeuvring element 8.

[0038] In an embodiment illustrated in figures 1-16, the lateral plate 13 has an extension such as to cover the mentioned opening 11 for a cylinder in a mounting configuration of the lateral plate 13 on the leaf 100.

[0039] In accordance with a further aspect of the invention, in such embodiments the lateral plate 13 can receive in application at least one removable covering element 18 arranged in such a position as to superpose the mentioned opening 11 for the cylinder.

[0040] The covering element 18, being plate-shaped, can be conformed in different ways so that it is possible to select the most suitable covering element as a function

of the specific requirements.

[0041] In fact, figure 5 illustrates four embodiments of the covering element 18, and in particular (from the top to the bottom in figure 5) with corresponding opening for the cylinder (in the event of using a cylinder, according to figure 8), with a simple vertical slit (key), with opening/closing identification (application on a leaf for a bathroom) and without any opening (in the latter case if no cylinder is used, therefore for simply covering the view of the opening 11 below).

[0042] The mentioned covering elements 18 can also have the function of covering the view of the mentioned threaded members 14 for the fastening of the lateral plates 13.

[0043] Figures 17-21 illustrate a second embodiment of the closure system 1 according to the present invention, which differs from the embodiment of figures 1-16 due to the fact that the manoeuvring elements 8 or pins are not applied to the closing bar 5 but to the command member 12, and interact with a corresponding shoulder or with a corresponding seat of the closing bar 5 for drawing in translation the closing bar 5 following the manual activation of the command member 12.

[0044] Figures 22-24 illustrate further embodiments, compatible with the embodiments of figures 1-21 but in which the extension of the lateral plates 13 is reduced, in particular it is not such as to cover the opening 11 for a cylinder of the lock-body 2 or in the event that the lock-body 2 does not have the opening 11 for a cylinder. In that case the adoption of a separate washer 19 may be envisaged (figure 22) for access to the cylinder, or a hole 160 may be provided on the leaf 100 for a cross key (figure 22) or there may be no additional opening aside from the lateral opening to which the lateral plate 13 is applied (figure 24).

[0045] Advantageously, the present invention can be applied by retrofitting also on existing windows or doors or closure systems. In fact, in such situation, starting for example from a solution with a rotary handle, it may only be necessary to make lateral millings on the leaf for perfecting the dimension and/or shape of the lateral openings and subsequently modify the lock-body for the application of the pins to the closing bar and finally apply to the lateral openings the respective lateral plates provided with the command member for manoeuvring the pin. Alternatively, according to the variant embodiment described above, the modification to the lock-body is made for providing the closing bar with a manoeuvring seat inside which a corresponding pin of the command body of the lateral plate is intended to be engaged.

[0046] The present invention achieves the proposed objects, overcoming the disadvantages complained of in the known art.

[0047] In fact, the closure system according to the invention enables the opening of the lock of a leaf to be performed simply and effectively through a direct movement on the closing bar of the lock and in particular through a command lever arranged substantially flush

with the leaf. This therefore results in distinctly reduced dimensions.

[0048] The invention can also be applied relatively simply also to existing closure systems.

Claims

1. A closure system for a leaf of a window or door, comprising:
 - a lock-body (2) applicable to a leaf (100) of a window or door,
 - a closing bar (5) movable between an extracted configuration from the lock-body (2) and a retracted configuration in the lock-body (2), and
 - at least one command member (12) manually activatable by a user and kinematically connected or connectable to the closing bar (5), said command member (12) being manually subjectable to a thrust or traction force in order to assume at least two operating positions, corresponding to the extracted configuration and the retracted configuration of the closing bar (5), respectively,

characterised in that the command member (12) acts directly on the closing bar (5) by means of at least one manoeuvring element (8) directly applied to the command member (12) or to the closing bar (5).
2. The system according to claim 1, wherein said manoeuvring element (8) is defined by a pin applied to said closing bar (5) so as to be integral therewith and directly engaged in a contacting relation with said command member (12) or by a pin applied to said command member (12) so as to be integral therewith and directly engaged in a contacting relation with said closing bar (5).
3. The system according to claim 1 or 2, wherein the command member (12) is applicable to the leaf (100) and/or the lock-body (2) by fastening means (14) that is distinct with respect to an operating coupling between the command member (12) and the manoeuvring member (8), said fastening means (14) preferably comprising one or more threaded elements.
4. The system according to claim 2 or 3, wherein the pin (8) is applied to a receiving portion (6) of the closing bar (5) and wherein the lock-body (2) has a slot (10) having an elongate shape along a movement direction of the closing bar (5) in which said receiving portion (6) and/or said pin (8) are slidably movable.
5. The system according to claim 2 or 3, wherein the pin (8) is applied to, or obtained in a single piece with, a rear portion of the command member (12) opposite a normally-visible surface of the command member (12), and wherein the lock-body (2) has a slot (10) having an elongate shape along a movement direction of the closing bar (5) in which said pin (8) is slidably movable.
6. The system according to claim 2, further comprising a lateral plate (13) applicable to the leaf (100) and/or to the lock-body (2) and wherein the command member (12) is mounted on the lateral plate (13) preferably so as to have at least one movement component along the movement direction of the closing bar (5),
7. The system according to claim 6, wherein said manoeuvring element (8) is defined by a pin applied to said closing bar (5) so as to be integral therewith and directly engaged in a contacting relation with said command member (12) and wherein the command member (12) has an engaging portion (17) configured to intercept said pin (8) so as to draw the closing bar (5) in movement at least from the extracted position to the retracted position.
8. The system according to claim 7, wherein the engaging portion (17) has an extension direction which is maintained transversal to the movement direction of the closing bar (5) along all of the stroke of the closing bar (5) between the extracted and retracted positions.
9. The system according to claim 7 or 8, wherein said command member (12) comprises a lever hinged in a hinging portion which is eccentric with respect to the pin (8), preferably in a hinging portion arranged above the pin (8).
10. The system according to one or more of claims from 6 to 9, wherein said command member (12) comprises a slidable cursor or a hinged lever, said cursor or lever being preferably substantially plate-shaped lying perpendicular to a longitudinal axis of said pin (8).
11. The system according to one or more of preceding claims from 7 to 9, wherein said engaging portion (17) comprises a wall arranged on a rear zone of the command member (12) opposite a normally-visible portion of the command member (12).
12. The system according to one or more of preceding claims from 6 to 11, wherein said lock-body (2) has an opening (11) for a cylinder and wherein the lateral plate (13) has an extension that is such as to cover said opening (11) for a cylinder in a mounted configuration of the lateral plate (13), said lateral plate (13) being equipped with at least one removable covering

element (18) arranged in such a position as to superpose said opening (11) for the cylinder.

13. The system according to one or more of the preceding claims, comprising two manoeuvring members (8) associated to relative opposite sides of the closing bar (5), each of which is associated to a respective command member (12). 5
14. The system according to claim 13, when dependent on claim 2, wherein each pin (8) is arranged on a respective lateral surface of the command bar (5) and wherein said pins (8) are connected to one another by means of a single threaded member (9) inserted in a through-hole or - seat (9) of the closing bar (5). 10 15
15. A leaf of a window or door equipped with a closure system (1) according to one or more of the preceding claims, said leaf (100) having a containing seat (110) in which said lock-body (2) is inserted and accessible by a frontal opening (120), arranged on a front edge of the leaf (130) in order to enable an insertion of the lock-body (2) into the containing seat (110), and by at least one lateral opening (140) arranged on a larger surface (150) of said leaf (100); said command member (12) being laterally applied to said leaf (10) and/or to said lock-body (2) at said lateral opening (140), wherein said command member (12) is preferably mounted on a respective lateral plate (13) having a peripheral profile that is complementarily-shaped to said lateral opening (140) and preferably quadrangular and having a configuration that is such as to be substantially flush with said larger surface (150) of the leaf (100) in a mounted configuration on said leaf (100) and/or lock-body (2). 20 25 30 35
16. A modifying method of a closure system for pre-existing windows or doors, comprising the steps of: 40
 - predisposing a leaf (100) equipped with a lock-body (2), in particular of a type activated by means of a rotating handle;
 - realising a widening of an existing lateral opening (140) of said leaf (100), said lateral opening (140) being in communication with a housing seat (110) for said lock-body (2); 45
 - modifying said lock-body (2) applying at least one lateral pin (8) on the closing bar (5) of the lock-body (2) in such a way that said lateral pin (2) exits from an elongate slot (10) of said lock-body (2); 50
 - applying a lateral plate (13) to said lateral opening (140), said lateral plate (13) having a command member (12) configured to intercept and move said lateral pin (8) according to a translation movement corresponding to a corresponding movement of the closing bar (5) between 55

respective extracted and retracted positions with respect to the lock-body (2).

17. A modifying method of a closure system for pre-existing windows or doors, comprising the steps of:
 - predisposing a leaf (100) equipped with a lock-body (2), in particular of a type activated by means of a rotating handle;
 - realising a widening of an existing lateral opening (140) of said leaf (100), said lateral opening (140) being in communication with a housing seat (110) for said lock-body (2);
 - modifying said lock-body (2) realising at least one manoeuvring seat on the closing bar (5) of the lock-body (2);
 - applying a lateral plate (13) to said lateral opening (140), said lateral plate (13) having a command member (12) provided with a pin (8) configured to cooperate with said manoeuvring seat of the closing bar (5) in order to move said closing bar (5) between respective extracted and retracted positions with respect to the lock-body (2) following a movement of said command member (12).

Fig.1

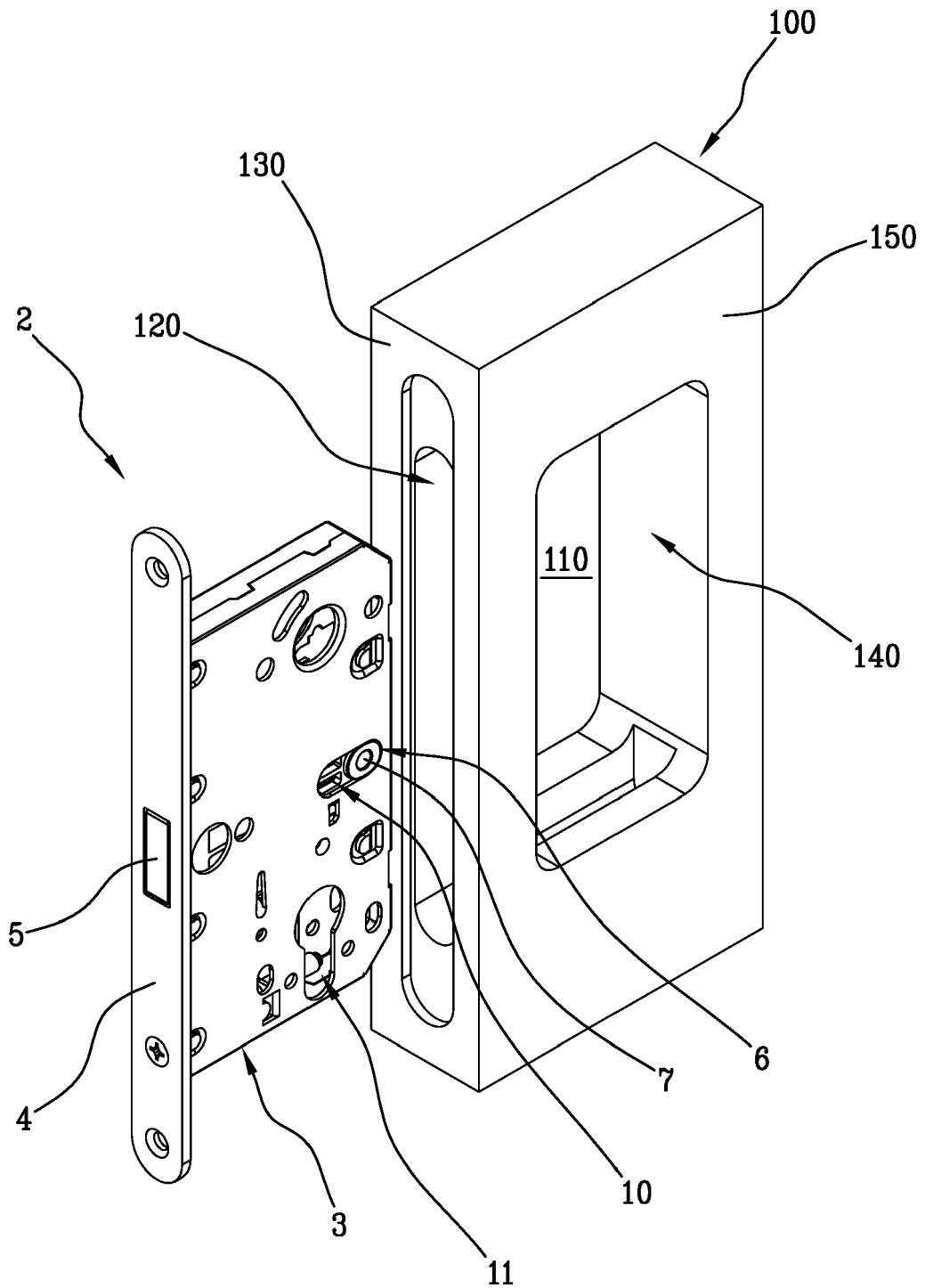


Fig.2

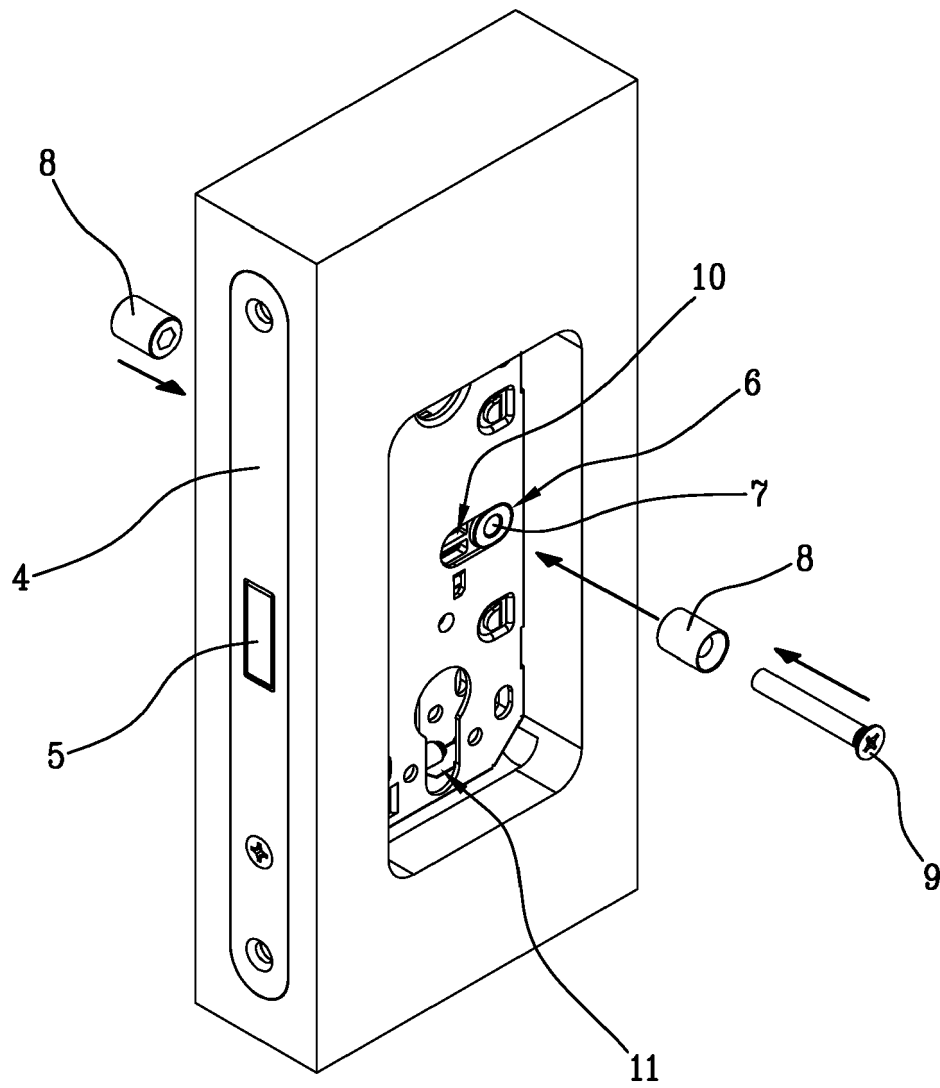


Fig.3

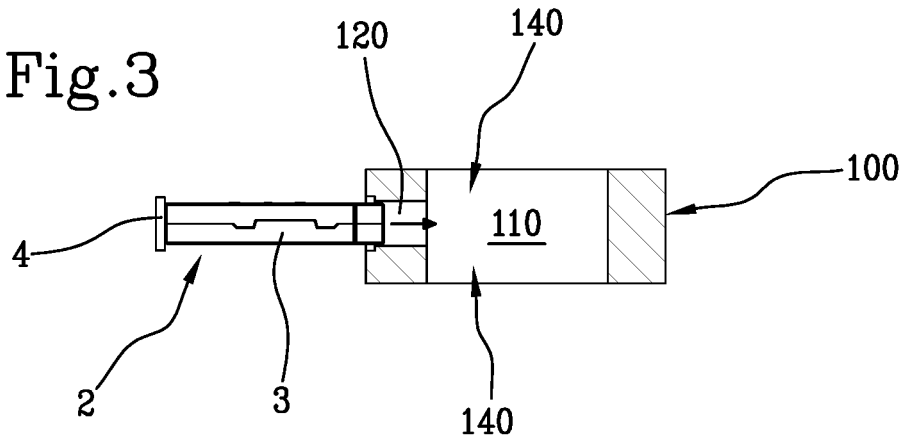


Fig.4A

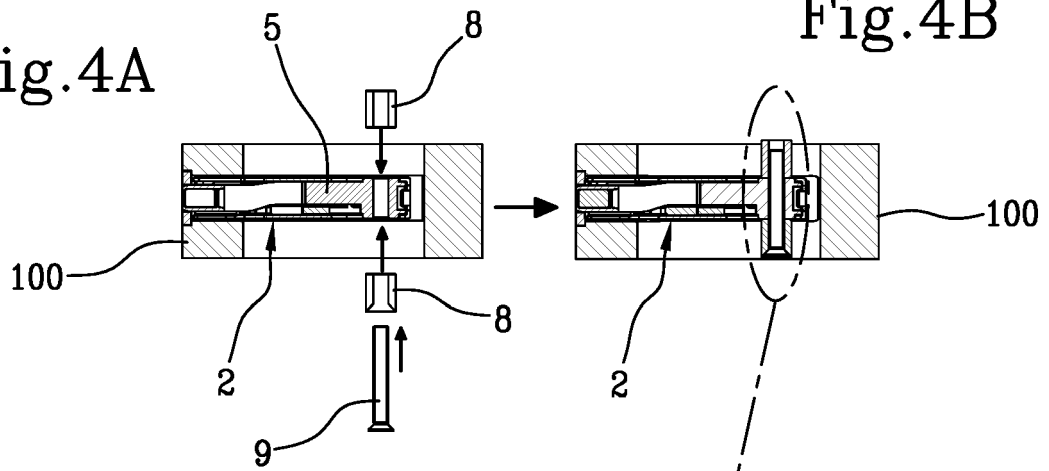


Fig.4B

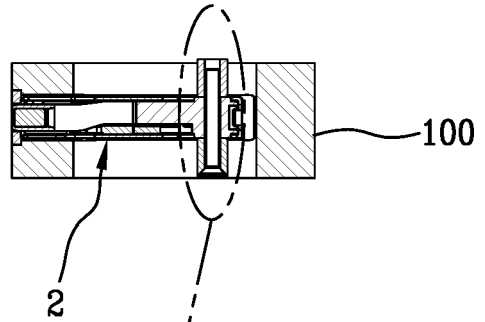


Fig.4C

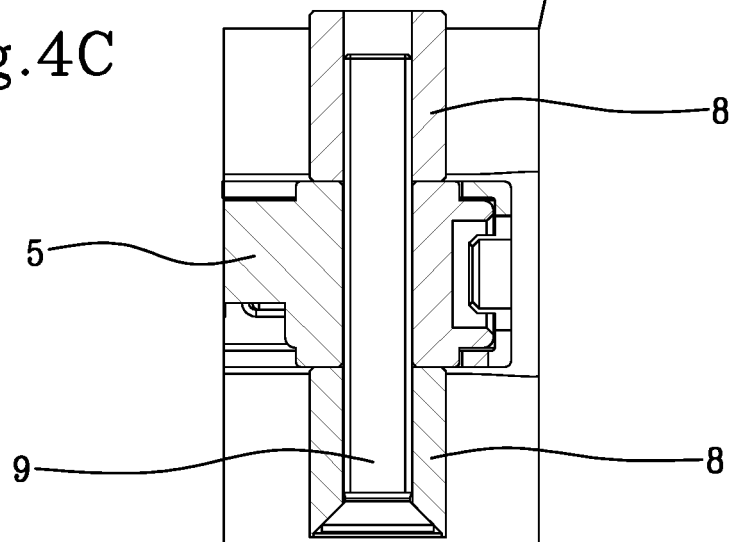


Fig.5

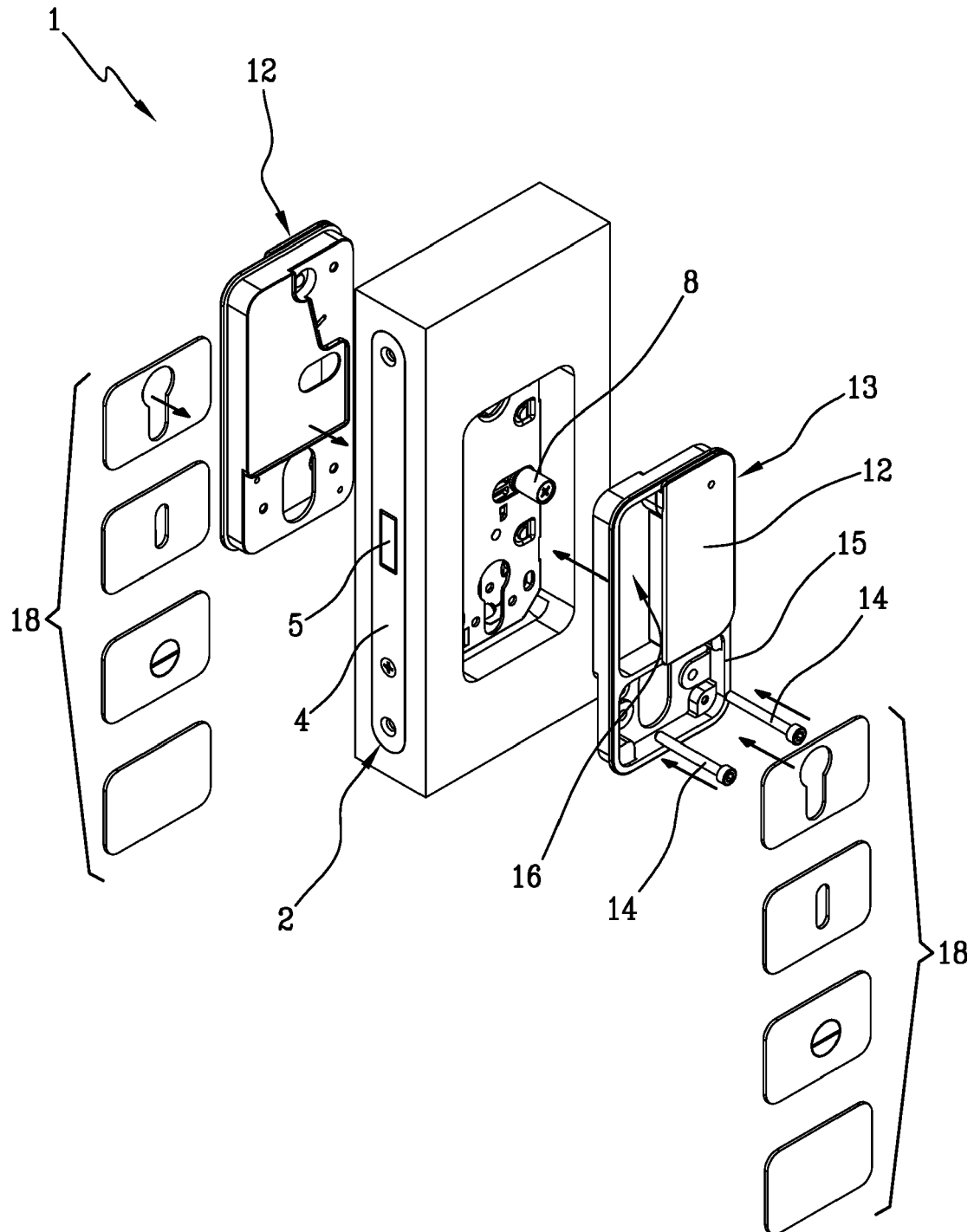


Fig.6

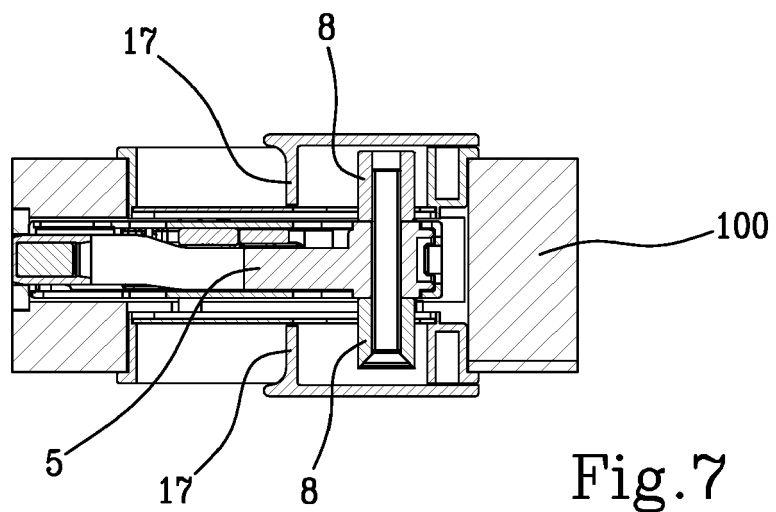
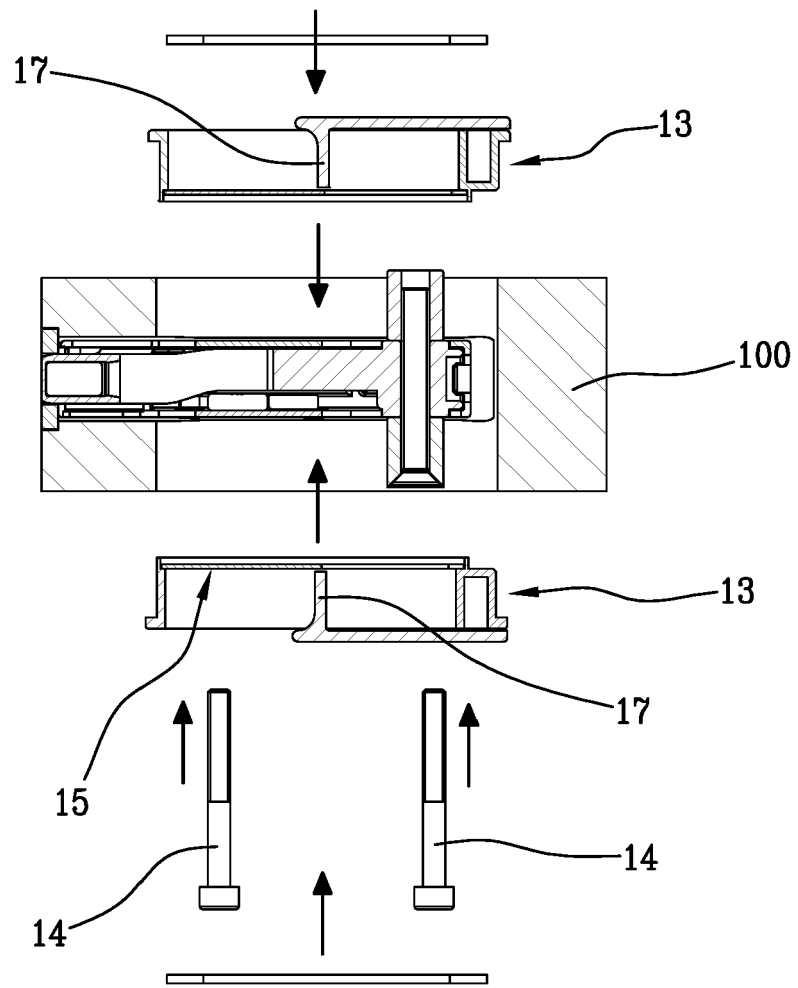


Fig.7

Fig.8

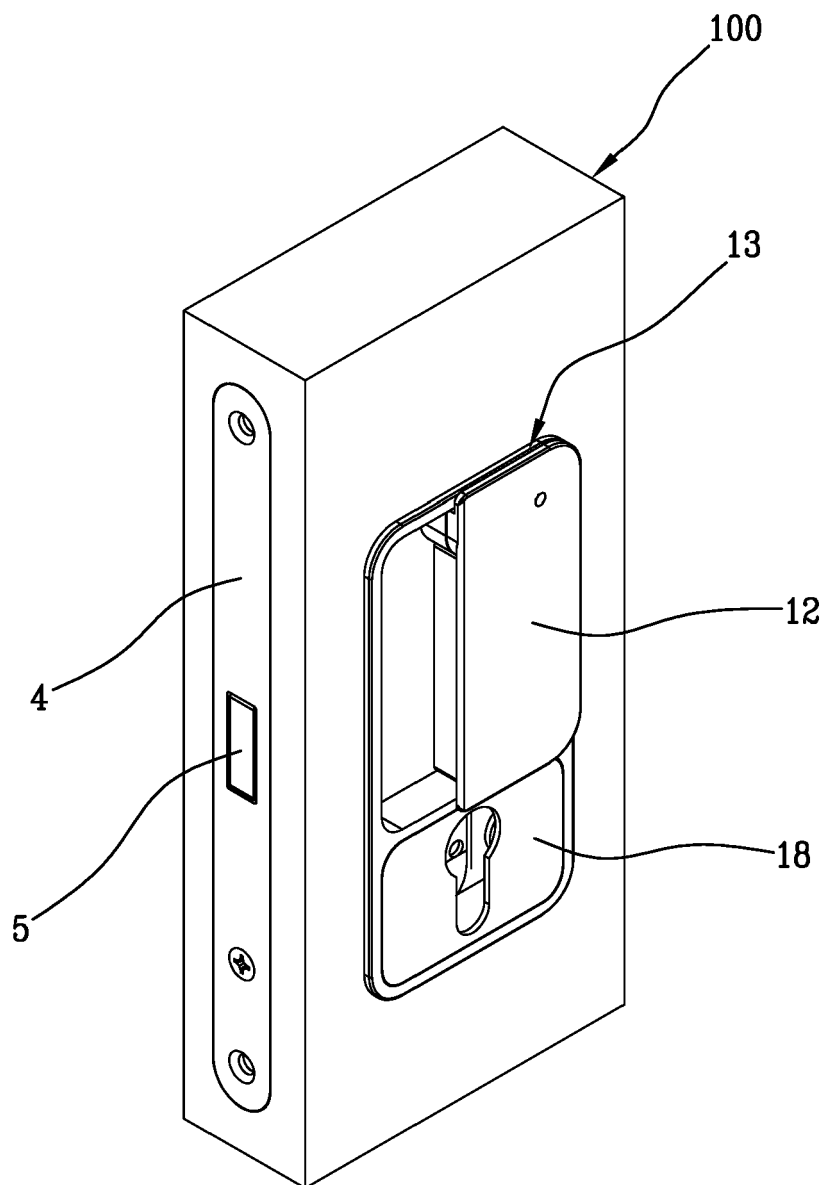


Fig.9

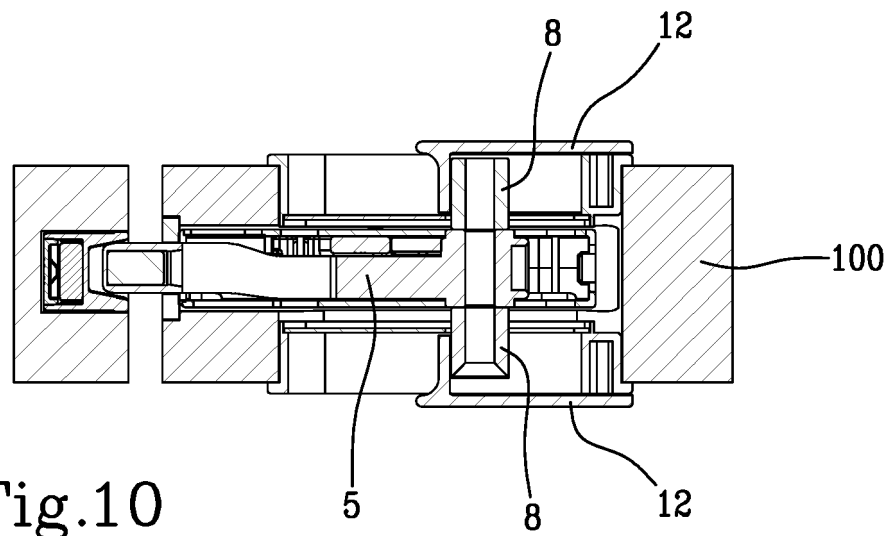
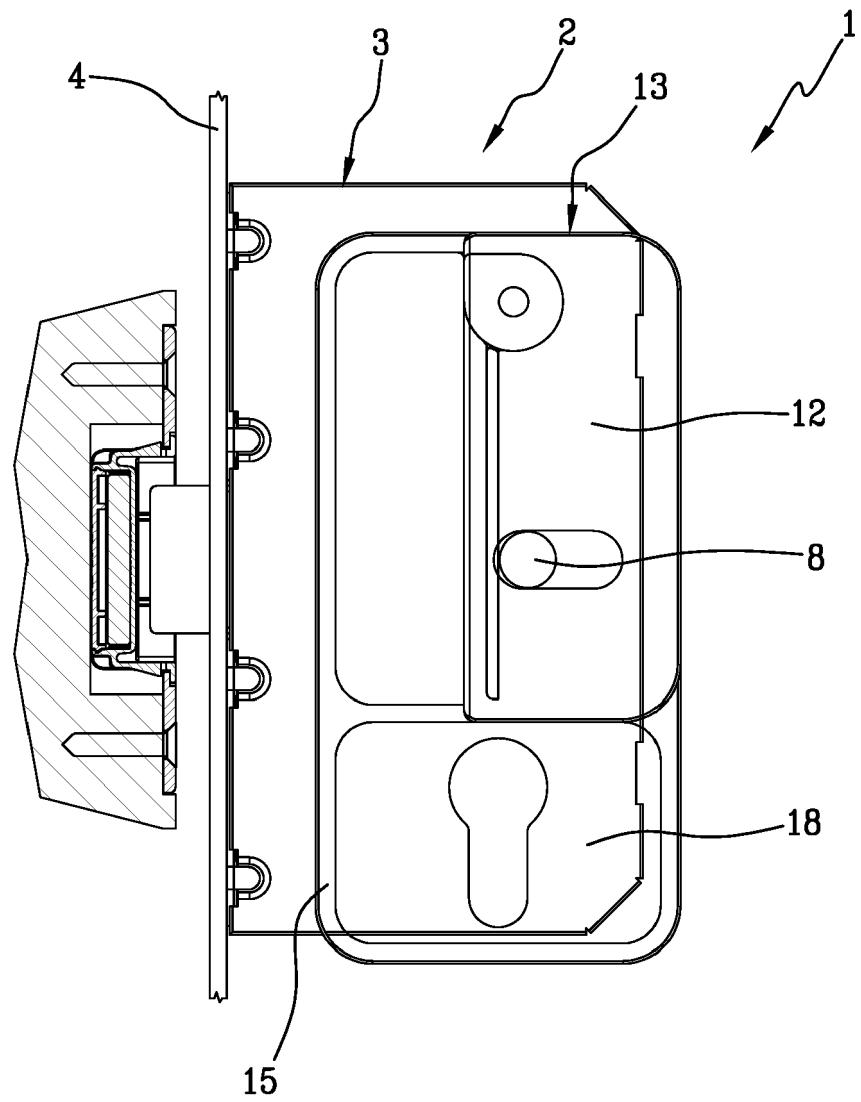


Fig.10

Fig.11

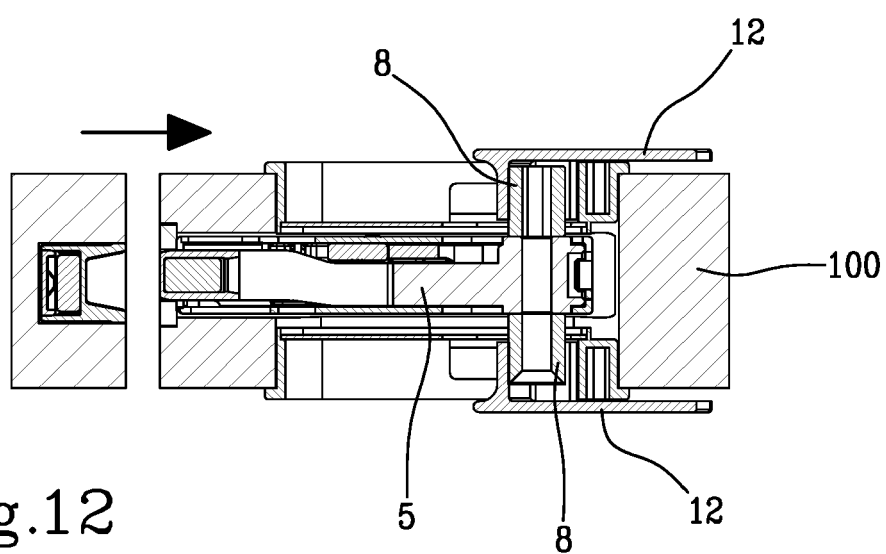
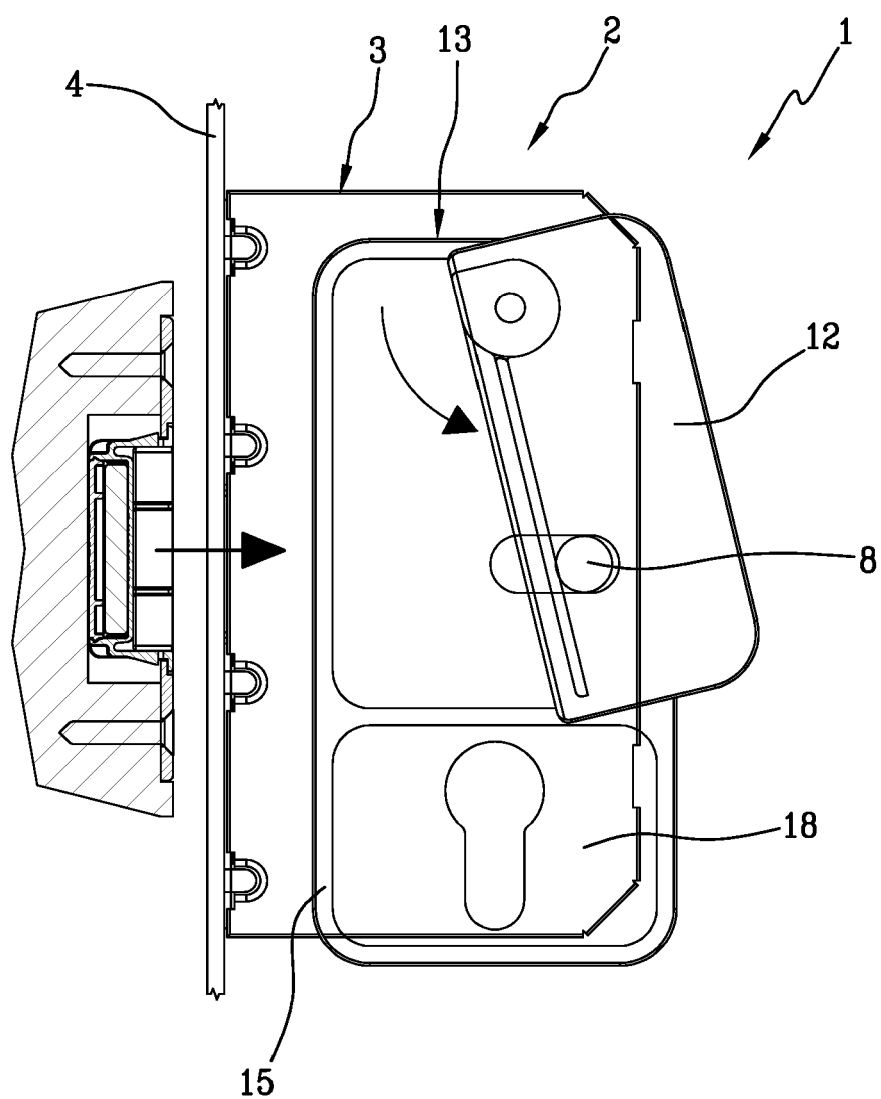


Fig.12

Fig.13

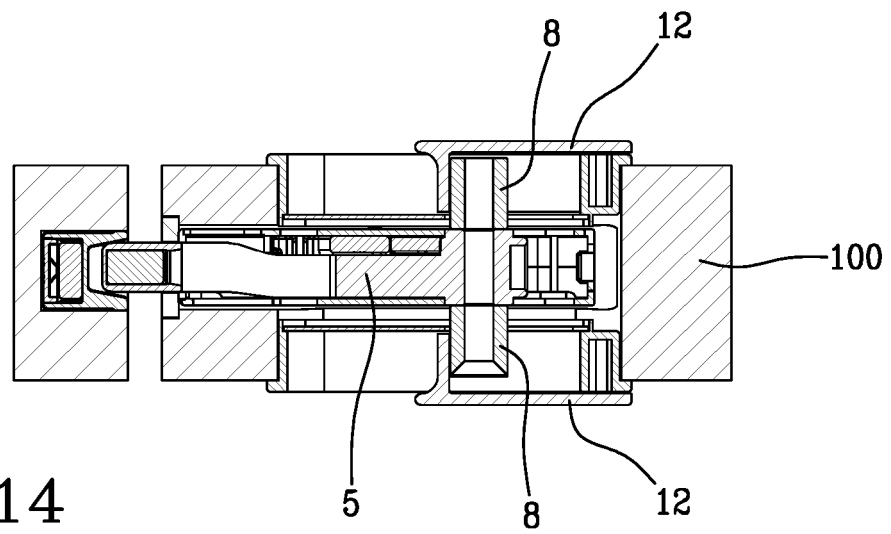
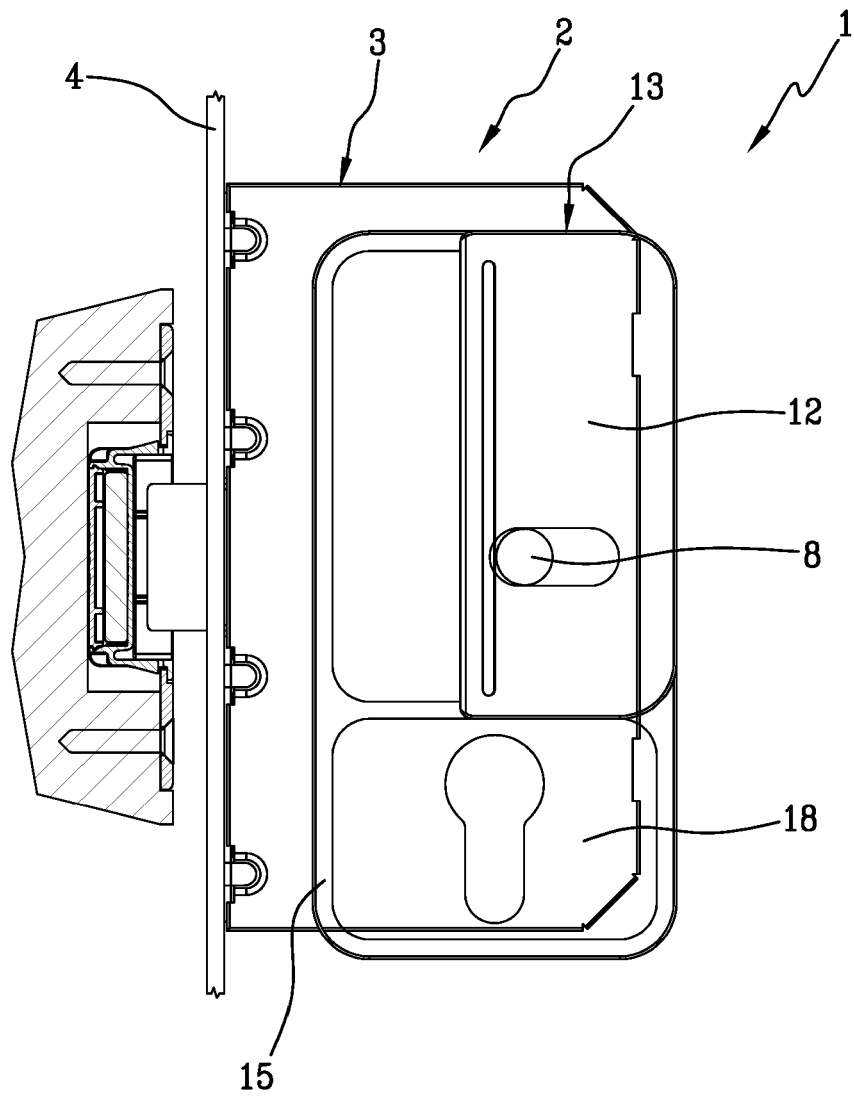


Fig.14

Fig.15

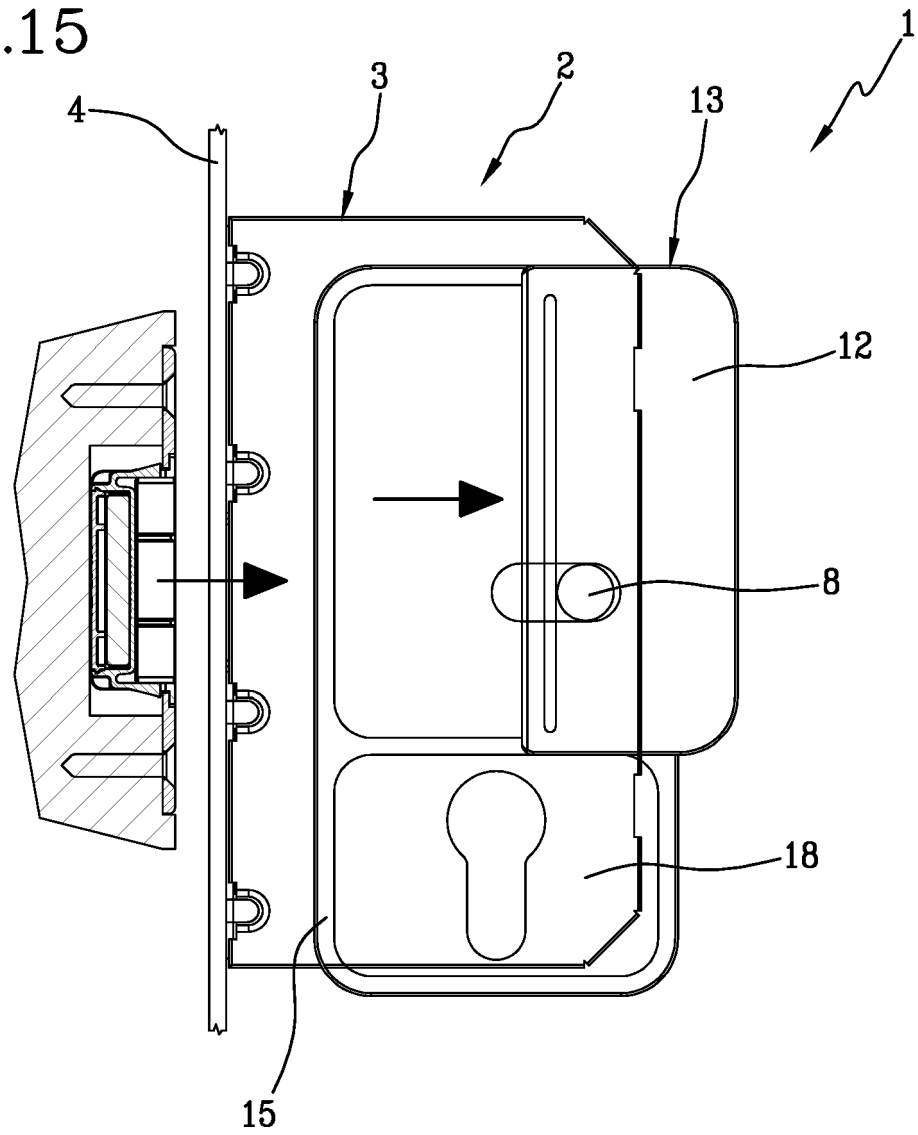


Fig.16

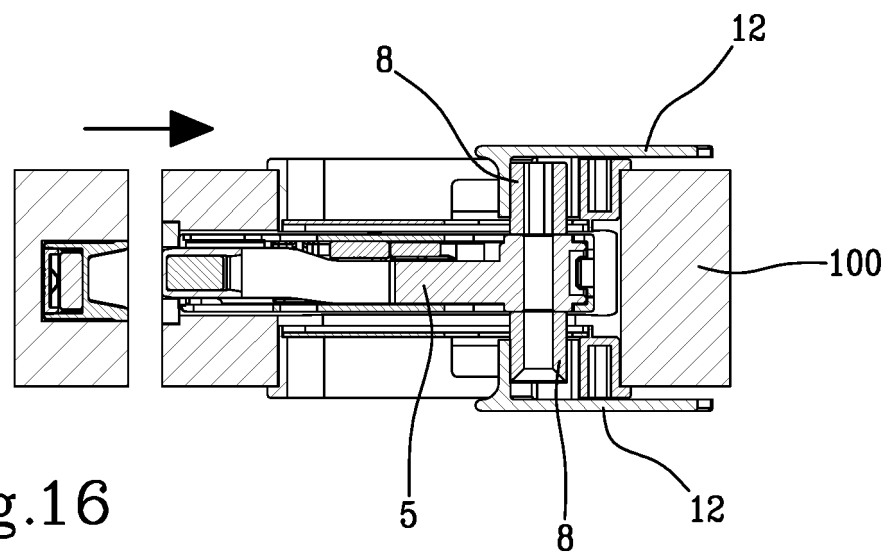


Fig.17

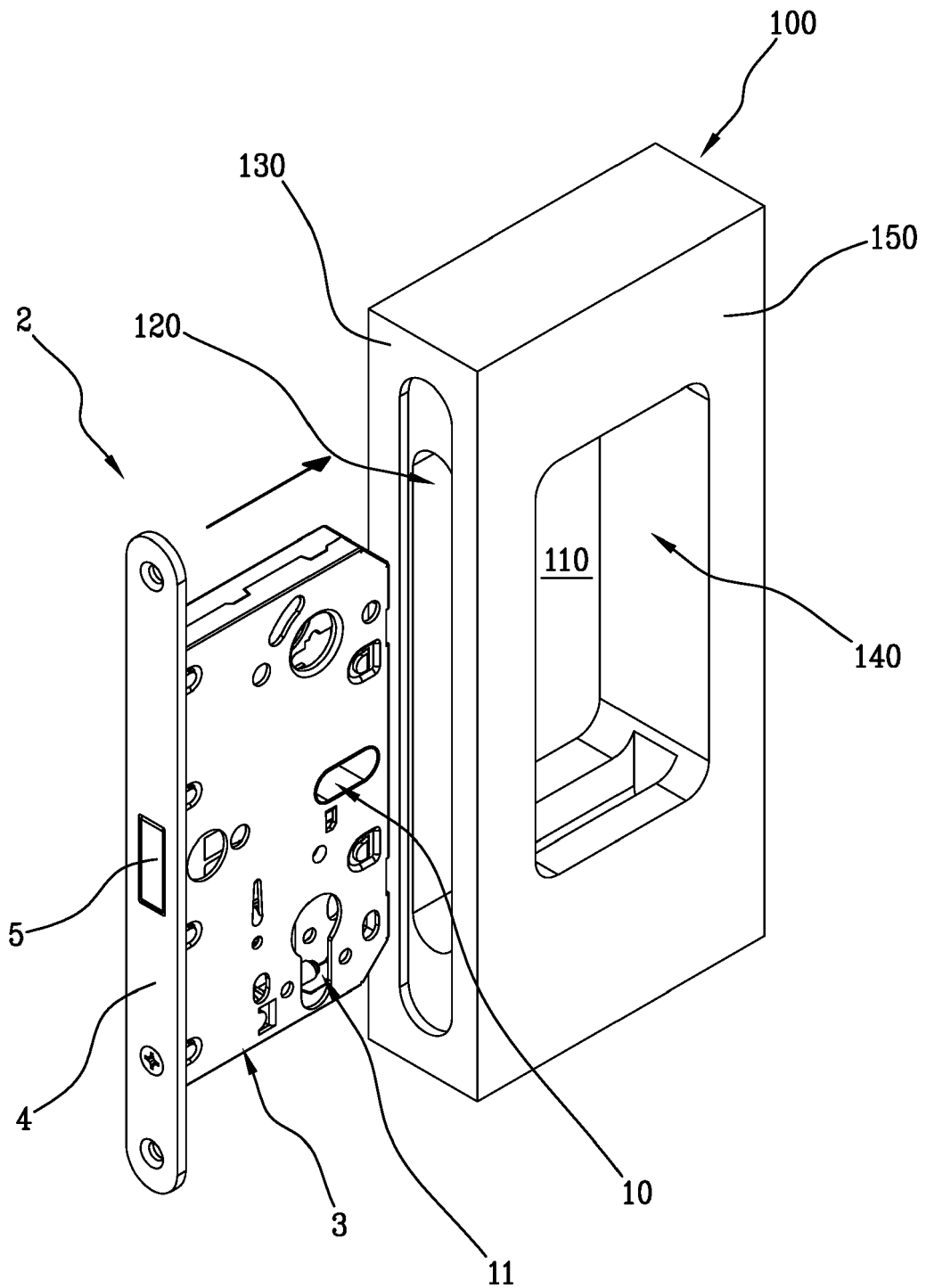


Fig.18

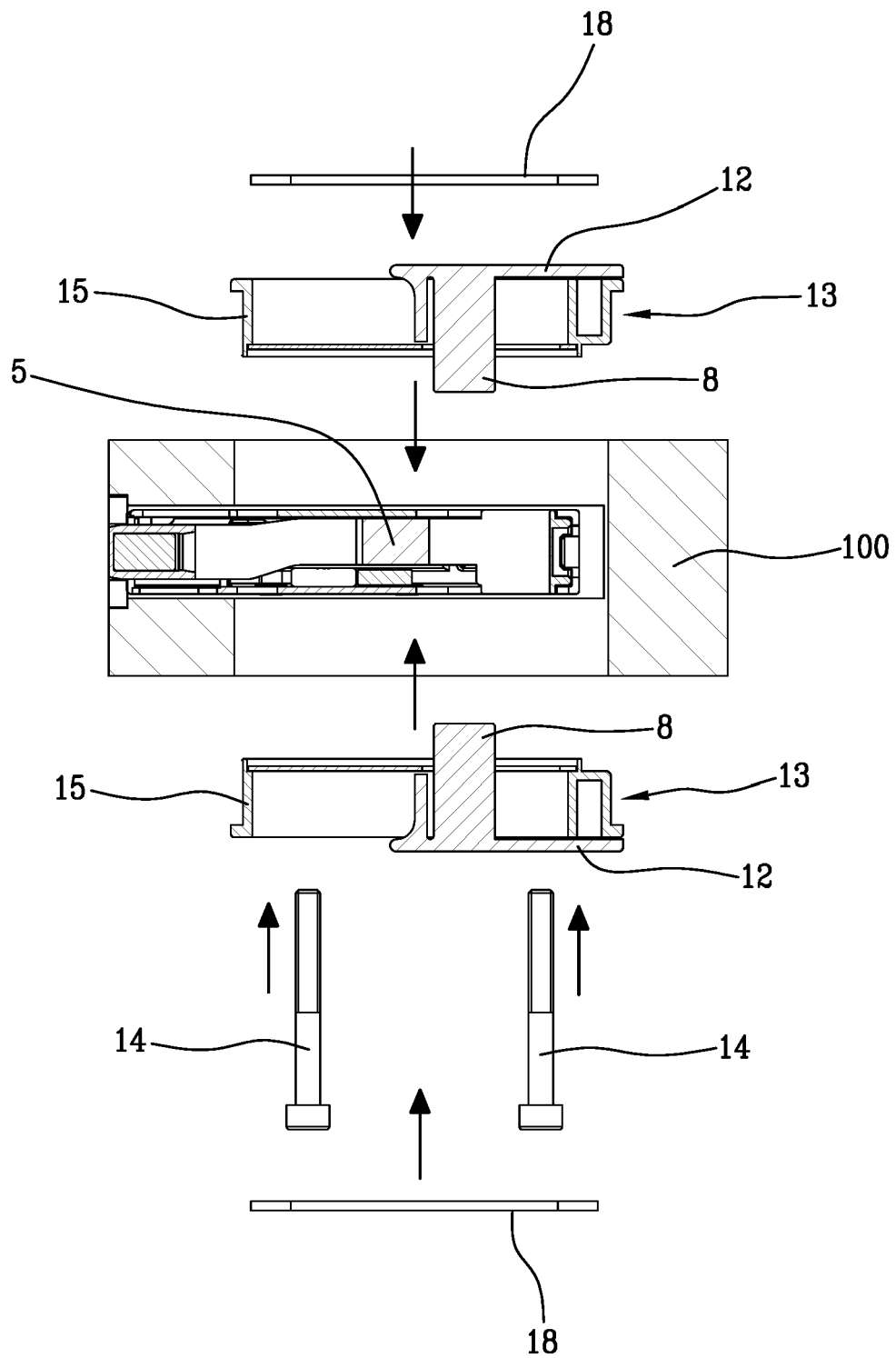


Fig.19

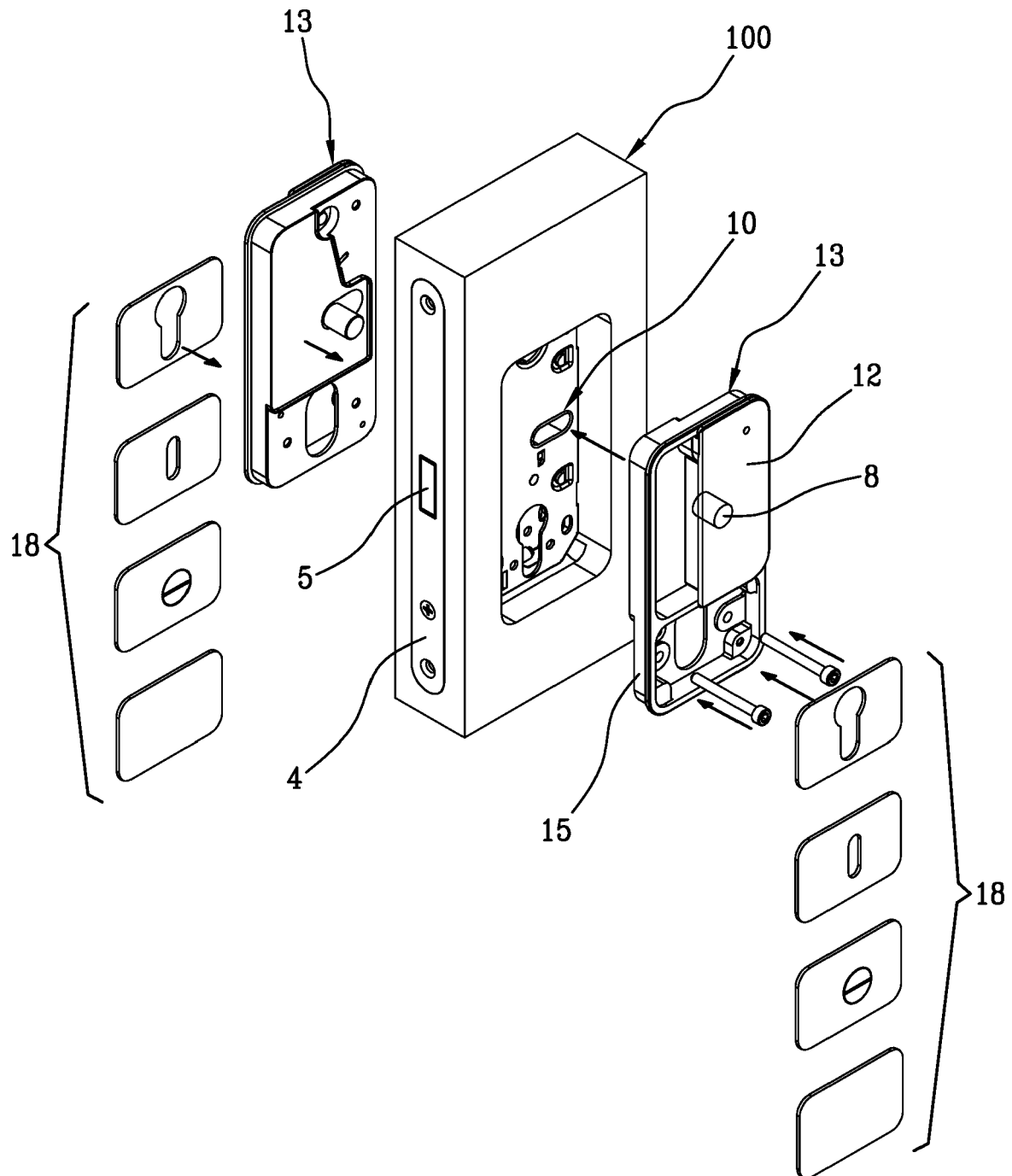


Fig.20

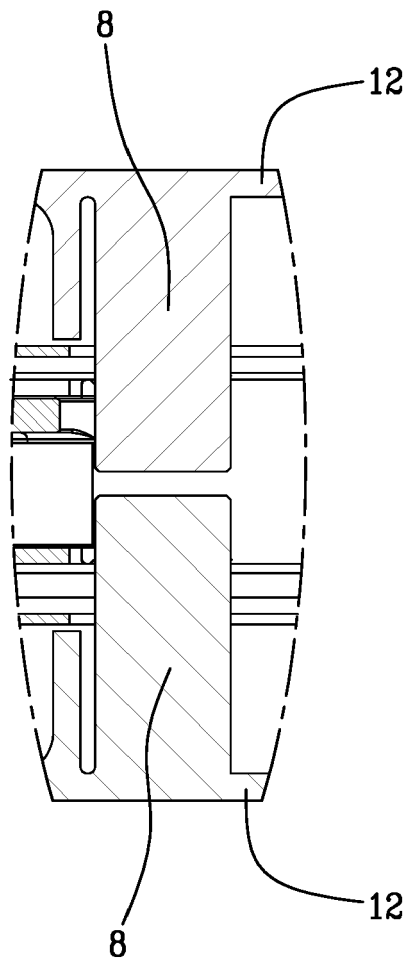
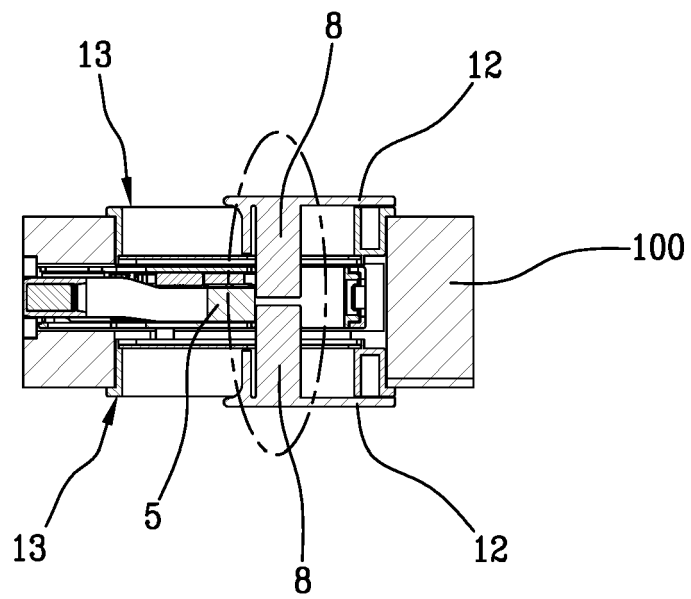


Fig.20A

Fig.21

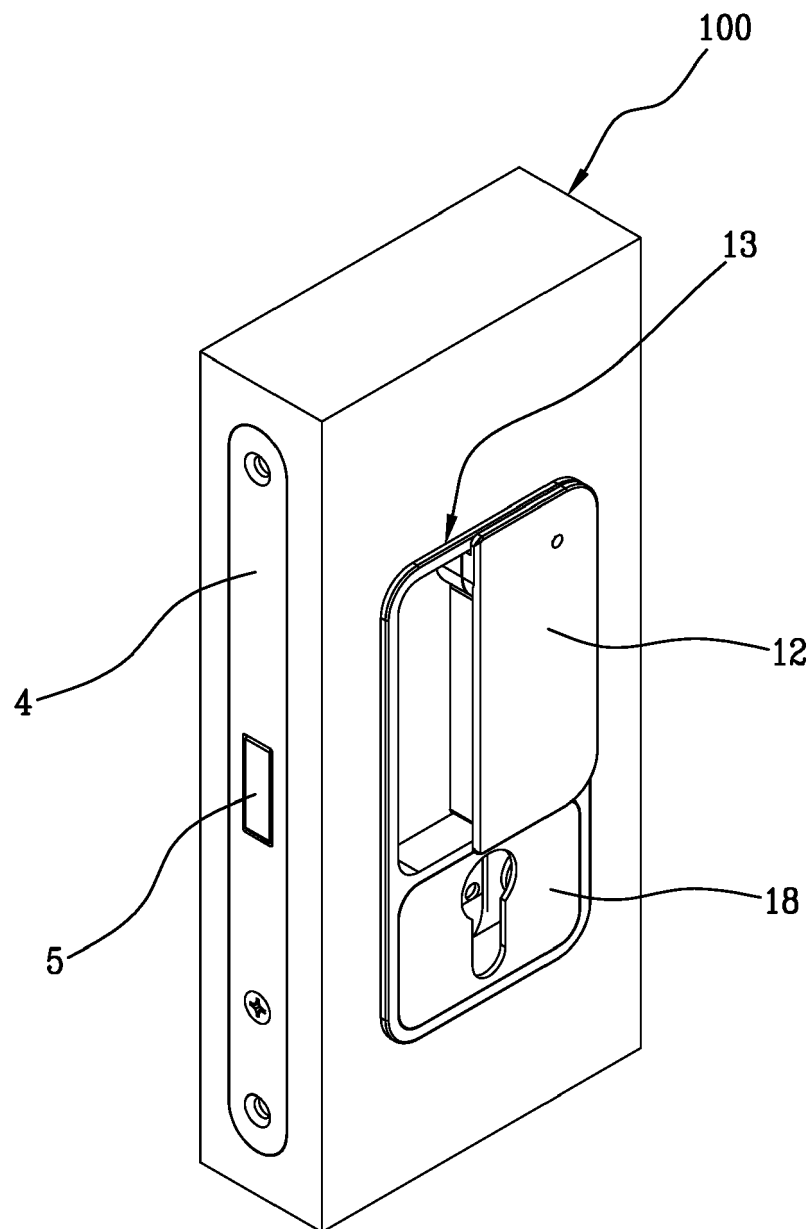


Fig.22

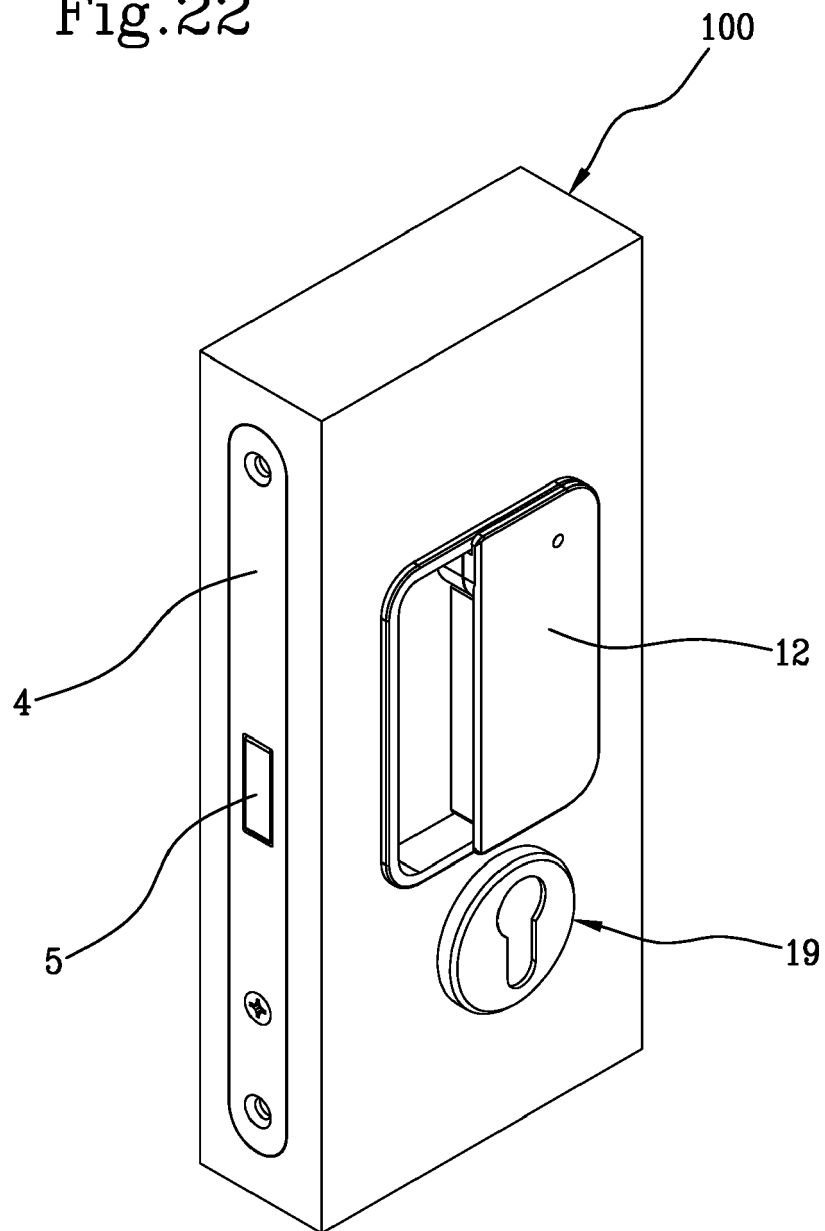


Fig.23

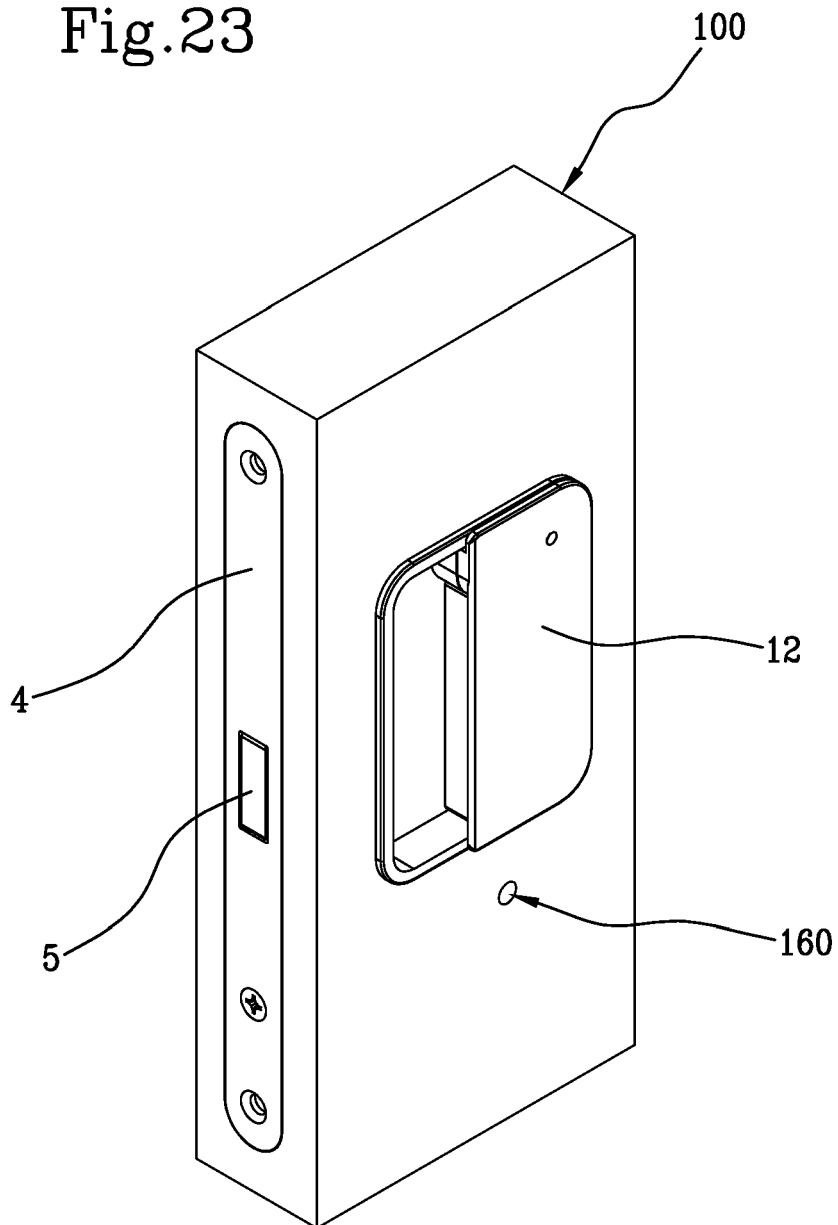
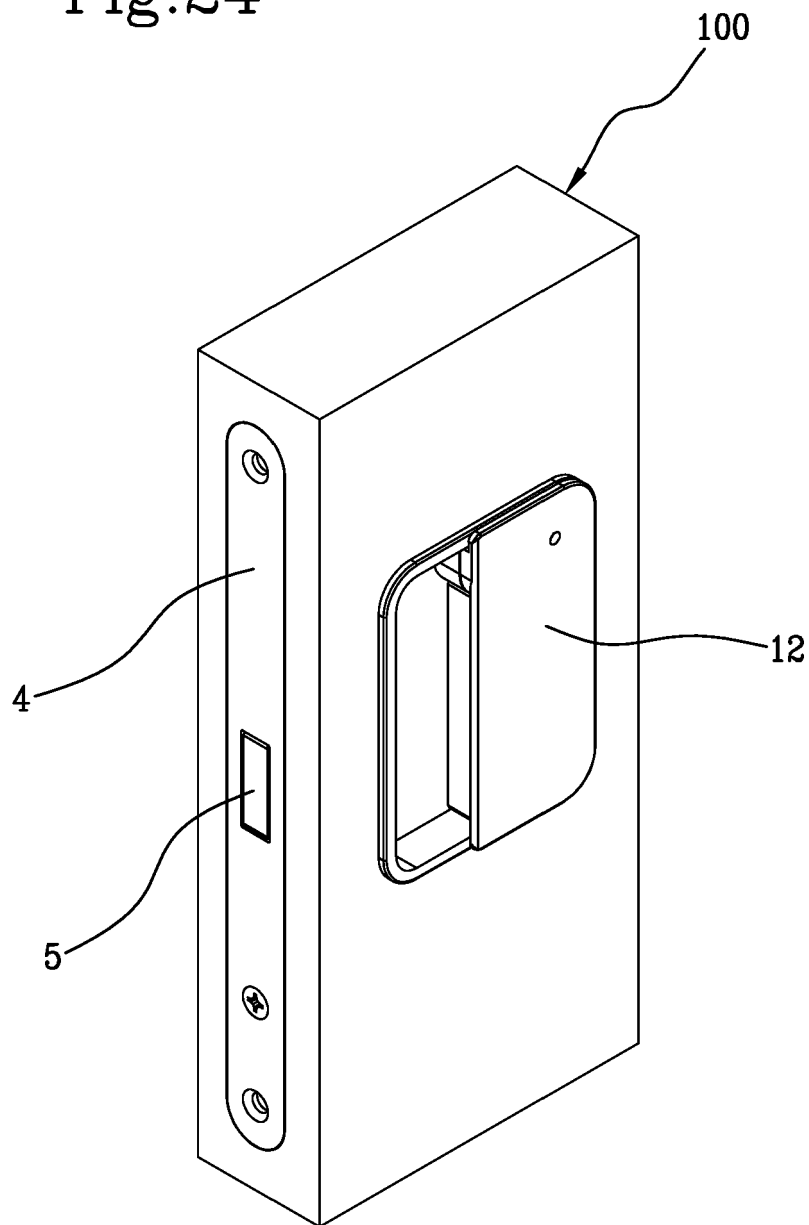


Fig.24





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X	US 9 394 732 B1 (AHMAD ABDULAZIZ K H M A A [KW]) 19 July 2016 (2016-07-19) * column 2, line 52 - column 3, line 58; figures 1-4 *	1-17	ADD. E05B9/08
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X	EP 3 327 227 A1 (ALBAN GIACOMO SPA [IT]) 30 May 2018 (2018-05-30) * abstract; figures 1-3 *	1-17	
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 January 2020	Examiner Boufidou, Maria
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The members are as contained in the European Patent Office EDP file on
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