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(54) **Device for locking doors such as, particularly, wardrobe doors, cabinet doors, drawers, and the like**

(57) The invention relates to a lock device (100) for doors, such as wardrobe doors, cabinet doors, drawers and the like, which comprises a lock block (101) to be controlled in order to shift from an open position to a closed position and vice versa.

Furthermore, an actuator (108) for the lock block can be coupled to said block and operated by means of a key to control the closure/opening of the lock block. Particularly, the actuator is provided with first engaging means

(108a) that can be operatively coupled with counter-engaging means (104a) of the lock block.

The device is characterized in that it further comprises a handle (114) for manual operation, which can be releasably coupled to the lock block. Particularly, the handle comprises second engaging means (403') that can be operatively coupled with the counter-engaging means (104a) of the lock block in replacement of said first means for controlling the closure/opening of the lock block.

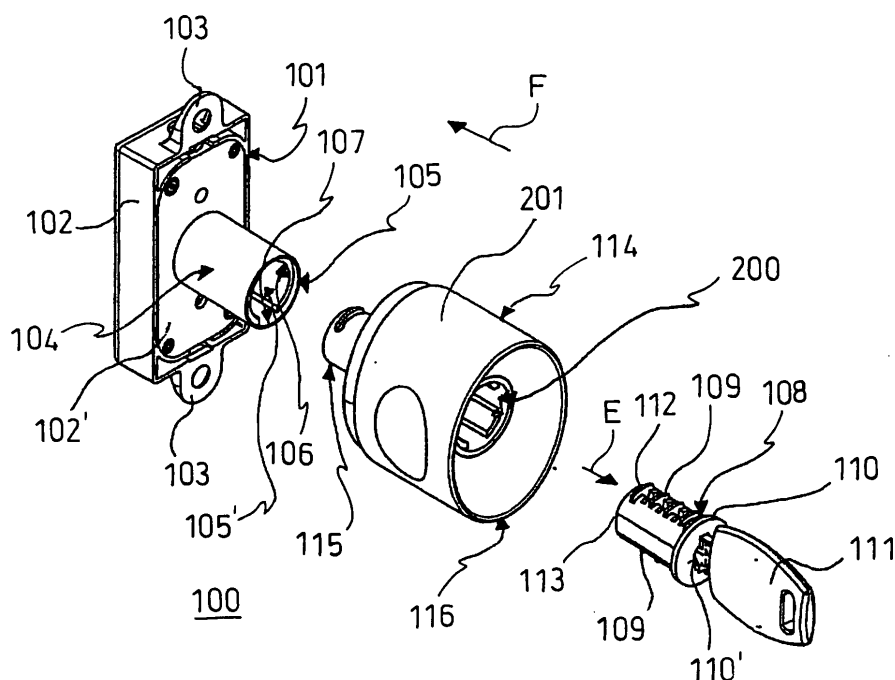


FIG.1

Description

[0001] The present invention relates to devices for locking doors, particularly, the invention relates to a locking device for closing and locking wardrobe doors, cabinet doors, drawers, and the like.

[0002] A first known type of locks that are used to close and lock wardrobe doors, cabinet doors, and drawer units comprises locks consisting of a block containing the lock mechanisms which is fixed to an inner wall of the door.

[0003] An actuating mechanism for the lock block to be operated by means of a key is, generally, housed within the door such as to project from an outer wall of the door by means of a keyhole.

[0004] Said locks can be operated from the outside of the wardrobe or cabinet by inserting the key in the keyhole in order to lock and unlock the closure of the doors.

[0005] It should be observed that a second known type of locks to be used for locking wardrobe doors includes locks comprising a handle or knob that is connected to the lock block and such as to project from the outer wall of the wardrobe door. Particularly, this knob includes the actuating mechanism for the lock (including the keyhole) to control the locking of the door by means of the key. Furthermore, the knob is a grip element that facilitates approaching and manual opening the doors by users of the wardrobe when the lock has been unlocked.

[0006] In order to modify the locks installed to wardrobe doors, for example, in order to replace the first type of locks with the more practical locks provided with knob, a quite long installation time as well as the intervention of skilled operators is currently required. In fact, this replacement provides that the whole lock block of the first type is disassembled from each wardrobe door in order to be replaced with the special lock block for the second type of lock to which the knob is connectable.

[0007] The same installation drawbacks are also met when one decides to replace the locks of the second type with those of the first type that are not provided with a knob.

[0008] The object of the present invention is to provide a lock device which allows the simple and rapid replacement of the locks of the type to be operated by a key (with keyhole in the door) with those also provided with a knob, and vice versa.

[0009] This object is achieved by a lock device such as described in the annexed claim 1. Preferred embodiments of the device of the invention are defined in the dependent claims.

[0010] The characteristics and advantages of the present invention will appear from the detailed description below of an exemplary and non-limiting embodiment thereof, in relation with the annexed drawings, in which:

- Fig. 1 shows a cut-away perspective view of a lock device in accordance with the invention comprising a lock block, a knob and a rotating actuator;
- Fig. 2 shows a perspective exploded view of the knob

of the lock device in Fig. 1;

- Fig. 3 shows a perspective view of the lock device in Fig. 1 in an assembled configuration;
- Fig. 4 shows a perspective view of a support element for the knob in Fig. 1;
- Fig. 5 shows a longitudinal section of the lock device in Fig. 3 in the assembled configuration;
- Fig. 6 shows a disassembly step of the knob from the lock block;
- Fig. 7A and 7B show a top view and a longitudinal sectional view, respectively, of an adapter for the knob in Fig. 2;
- Fig. 8 shows a detail of the rotating actuator in Fig. 1.

[0011] With reference to Fig. 1-8, a preferred embodiment of a lock device 100 for doors in accordance with the present invention will be now described. Identical or similar elements and components will be designated by the same numerals throughout the figures.

[0012] Particularly, by "doors" is meant wardrobe doors (either leaf or sliding doors), cabinet doors, drawers, and the like.

[0013] This lock device 100 comprises a known lock block 101 that can be fixed to an inner surface of a wardrobe door (not shown) by means of fixing means such as screws, nails, or the like. Particularly, the lock block 101 comprises a metal body 102 having, for example, a box-like shape and being intended for accommodating the lock mechanisms that can be operated between an open position and a closed position, and vice versa.

[0014] The lock mechanism comprises elements that are capable of preventing the opening movement of the doors, such as, for example, a latch, a spring-latch, vertically sliding or rotary rods.

[0015] Furthermore, the box-like body 102 is provided with fixing tabs 103 that are made as one piece with the latter and provided with through holes for fixing the lock block 101 to the wardrobe door.

[0016] In addition, the lock block 101 comprises a substantially cylindrical metal sleeve 104, that is made as one piece with the box-like body 102. This sleeve 104 is orthogonal to a base wall 102' of the box-like body 102 and provided with a first circular opening 105 for access to a first chamber 105'. This first chamber 105' is defined by the sleeve 104 and a bottom wall 104' (shown in Fig. 5) that is internal to the lock block 101 and opposite said first opening 105.

[0017] As it is known by those skilled in the art, with the lock block 101 being fixed to the inner surface of a wardrobe door, the sleeve 104 can be inserted within a through hole being provided in the door such that said first circular opening 105 of the sleeve 104 results to be accessible from an outer surface of the door.

[0018] Furthermore, a first inner cylindrical surface 106 of the sleeve 104 is shaped such as to comprise longitudinal grooves 107 that are parallel to the axis of the sleeve 104 and counter-posed relative to each other.

[0019] A rotating actuator 108 for the lock device 100

can be inserted within the first chamber 105' of the sleeve 104 through the first circular opening 105 in order to operate the mechanisms of the lock block 101.

[0020] Particularly, this actuator 108 comprises, for example, a rotating metal cylinder being provided with a plurality of plates 109, each of which elastically projects in the direction orthogonal to the longitudinal axis of the rotating cylinder 108 through either one of opposite slots that are formed in the outer surface of the cylinder 108. As it is known by those skilled in the art, these plates 109 are such as to interact with the teeth of a specific key (not shown in the figures) for the lock in question.

[0021] It should be observed, particularly, that the rotating cylinder 108 can be inserted and reversibly extracted from the sleeve 104 of the lock block 101 by means of a first key 111 or extraction/insertion key. This extraction/insertion key 111 can be inserted within a lock keyhole 110' being provided at a first end 110 of the cylinder 108.

[0022] Furthermore, a first retaining plate 112 is provided at a second end 113 of the cylinder 108 opposite the first end 110.

[0023] It should be observed that when the extraction/insertion key 111 is completely inserted within the keyhole of the rotating cylinder 108, this retaining plate 112 is substantially housed in a retracted position within the cylinder 108, thereby allowing the latter to be inserted within the first chamber 105' of the sleeve 104.

[0024] After said first key 111 has been extracted from the keyhole 110', this first retaining plate 112 elastically projects, similar to the plates 109, outside the rotating cylinder 108 through a further slot thus resulting in the extracted position. In this position, the first retaining plate 112 engages a seat provided on the first cylindrical inner surface 106 of the sleeve 104 to lock the metal cylinder 108 within the first chamber 105' thereby preventing an axial translation of the same.

[0025] It should be observed that, as shown in Fig. 1, the key 111 is partially inserted within the keyhole 110' such that the retaining plate 112 elastically projects outside the rotating cylinder 108.

[0026] Furthermore, with reference to Fig. 5, the rotating cylinder 108 comprises an end relief 108a at the second end 113. It should be observed that the relief 108a has, for example, a substantially pentagonal shape such as shown in Fig. 8 which is a view of the rotating cylinder 108 in the direction of the first arrow E.

[0027] This relief 108a is such as to engage a corresponding notch 104a being formed in the bottom wall 104' of the sleeve 104 and having a same shape of the relief 108a to ensure a proper orientation of insertion of the cylinder 108. Furthermore, as the end relief 108a is engaged with the notch 104, the transmission of the rotary movement from the cylinder 108 to the lock mechanisms is ensured.

[0028] It should be observed that the relief 108a (and consequently the corresponding notch 104a) can have any other shape.

[0029] It should be observed that the lock device 100 of the invention is mounted in a first operative configuration in the case where the lock block 101 is fixed to the wardrobe door and the rotating cylinder 108 is inserted within the sleeve 104 of the same block 101.

[0030] Furthermore, the lock device 100 of the invention comprises a manual operating unit 114 or handle of the lock block 101.

[0031] Particularly, this handle 114 has the shape of a knob and is suitable for controlling the mechanisms of the lock between an open position and a closed position.

[0032] Particularly, as shown in Fig. 1, the knob 114 comprises an inserting portion 115 that is suitable for being inserted within the first chamber 105' of the sleeve 104 in place of the cylinder 108. Furthermore, a front portion 116 of the knob 114 opposite said inserting portion 115 comprises an inlet to a second chamber 200 that is suitable for housing the rotating cylinder 108.

[0033] Thereby, as shown in Fig. 3, the lock device 100 can adopt a second operating configuration.

[0034] In greater detail, with reference to Fig. 2 and 4, the knob 114 comprises an outer support structure 201 having a transversal section, such as circular or elliptical. This support structure 201 is, for example, fabricated from metal or plastic.

[0035] Furthermore, the support structure 201 defines a substantially cylindrical duct 204 that is co-axial with this structure 201. Particularly, this is a through-duct 204 and substantially extends all over the length of structure 201. In addition, a first edge 202 of the duct 204 is joined to a front edge 207 of the support structure 201 by means of a substantially concave wall 206.

[0036] It should be observed that ergonomic notches 205 are advantageously formed on an outer surface 201' of the structure 201 in order to facilitate grasping the knob 114.

[0037] The knob 114 further comprises means 301 for fitting the thickness of the wardrobe door. In the example of the invention, these adapting means are embodied by a spacer 301 to be connected to a bottom portion 203 of the support structure 201 opposite said front edge 207.

[0038] Particularly, the spacer 301 comprises a substantially annular base element 302 made of plastics, for example. This base element 302 comprises an abutment wall 303 (not shown in Fig. 2 as it faces the lock block 101) which is intended to abut against the outer surface of the wardrobe door after the lock device 100 has been assembled in the second operating condition in Fig. 3.

[0039] The spacer 301 further comprises a plurality of pegs 304 for coupling the spacer 301 to the support structure 201. These pegs 304 are made as one piece with the base element 302 and orthogonally project therefrom in the opposite direction relative to the abutment wall 303. Particularly, the spacer 301 as shown in Fig. 2 comprises four pegs 304 each of which is provided with, at an end opposite the base element 302, a helical spring 305.

[0040] It should be observed that, in order to assemble the knob 114, the pegs 304 with springs 305 of the spacer

301 can be inserted within respective recesses 306 provided within the support structure 201 and shown in Fig. 4 in detail.

[0041] In addition, the knob 114 comprises means 401 suitable for housing the rotating cylinder 108 and suitable to allow inserting the knob within the first chamber 105' of the lock block 101.

[0042] With reference to Fig. 2, 7A and 7B, these inserting means and housing means are embodied by an adapter device 401 having a substantially cylindrical shape, and made of metal material, for example. Particularly, this adapter device 401 comprises a hollow cylindrical body 402 that is connected as one piece with the inserting portion 115 that is introduced with reference to Fig. 1. This inserting portion 115 is also cylindrical and has a smaller diameter than the hollow body 402.

[0043] This hollow cylindrical body 402 of the adapter 401 defines the second chamber 200 suitable for housing the rotating cylinder 108. Particularly, this rotating cylinder 108 can be inserted within said chamber 200 through a second circular opening 404.

[0044] Furthermore, a through-slit 406 extends along an arc of circle of the outer surface of the cylindrical body 402. This slit 406 is suitable for housing the first retaining plate 112 of the rotating cylinder 108 in the extracted position after said cylinder 108 is housed within the second chamber 200.

[0045] It should be observed that a cylindrical inner surface of the hollow body 402 is provided with a plurality of further longitudinal grooves 405 similar to the grooves 107 that are provided in the inner surface of the sleeve 104. Particularly, in the example in Fig. 2, the cylindrical body 402 comprises four grooves 405 that are equally spaced relative to each other.

[0046] It should be further observed that the outer surface of the adapter 401 includes a longitudinal groove 407 defined by a stop edge 407'. This groove co-operates with a respective relief 408 that is provided within the duct 204 of the support structure 201 (Fig. 4) in order to define a proper assembly orientation for the adapter 401 relative to the above support structure 201.

[0047] Furthermore, the adapter 401 includes a latch device 408 that is removably housed in a through-cavity 409 of the inserting portion 115.

[0048] With reference to Fig. 2, this latch 408 comprises a base portion 410 that is overlapped by a tapered portion or head 411 and provided with an eyelet 412 such as to have a substantially C-shaped section.

[0049] Furthermore, said through-cavity 409 extends orthogonal to the axis of the adapter 401 thereby allowing the latch 408 to translate only in this direction between two fixed positions. Particularly, in a first fixed position, the latch 408 is completely housed within the inserting portion 115 of the adapter device 401 and in a second fixed position the head 411 of the latch 408 protrudes from the adapter 401 in order to prevent the knob 114 from rotating about the axis thereof as will be discussed below.

[0050] It should be further observed that a cam element or extension 413 is inserted within the adapter 401 such as to occupy an intermediate position between said latch 408 and the second chamber 200. Particularly, this extension 413 comprises a barrel 413' that can be rotated between two fixed positions and elastically locked in these positions. As it is known by those skilled in the art, the locking of the barrel 413' in these fixed positions is provided by a first helical spring 413a that is fitted with a ball 413b, which are both housed in a respective seat that is formed on the surface of the barrel.

[0051] Furthermore, a shaped notch 415 is provided at the one end of the barrel 413' for housing the corresponding end relief 108a of the rotating cylinder 108 after the latter has been inserted within the chamber 200. In the example described herein, the notch 415 has a substantially pentagonal shape. Thereby, the barrel 413' is an extension of the cylinder 108 as it can integrally rotate therewith.

[0052] Furthermore, a through hole 414' extends from the bottom of the shaped notch 415 throughout the length of the barrel 413'.

[0053] In addition, the extension 413 includes a further peg 414 opposite said shaped notch 415 and capable of being inserted within the eyelet 412 of the latch 408 in order to convert the rotary motion imparted by the cylinder 108 to the extension 413 to the above translating motion of the latch 408.

[0054] Furthermore, the adapter device 401 comprises a second retaining plate 416 such as to orthogonally project relative to the longitudinal axis of the adapter 401 through a respective slot 417 that is arranged in the inserting portion 115.

[0055] As shown in the example in Fig. 2, this second retaining plate 416 has a hook shape and is associated with a further helical spring 416'. In an extracted position, this second retaining plate 416 is suitable for engaging the seat of the first cylindrical inner surface 106 of the sleeve 104 in order to lock the adapter 401 within the first chamber 105' of the sleeve 104, thus preventing the knob 114 from axially translating.

[0056] It should be observed that this second retaining plate 416 can be pressed to be extracted within the adapter device 401 in order to disengage the knob from the sleeve 104 of the lock block 101.

[0057] Furthermore, with reference to Fig. 7A and 7B, it should be observed that the adapter device 401 comprises a further end relief 403' that is arranged on the inserting portion 115 in the opposite direction to the hollow body 402. This further relief 403' is similar to the relief 108a that is arranged on the rotating cylinder 108 and shows the same pentagonal shape.

[0058] It should be observed that the further relief 403' is also capable of engaging the notch 104a being formed in the bottom wall 104' of the sleeve 104 in order to transmit a rotating motion being imparted to the knob 114 to the lock mechanisms. Thereby, the knob 114 is suitable to control the opening and closure of the lock mecha-

nisms.

[0059] It should be observed that the relieves 108a and 403' are equivalent control means for the lock devices. In fact, both relieves 108a and 403' are capable of mechanically coupling with the notch 104a, thereby resulting interchangeable with each other.

[0060] In addition, the further end relief 403' is provided with a further through hole 403'' such as to result on the same axis of the hole 413' of the extension 413.

[0061] In order to describe the assembly of the lock device 100 of the invention to, for example, a wardrobe door, it is assumed that, this lock device is initially in the first operating configuration, i.e. with the lock block 101 being mounted to the wardrobe door and the rotating cylinder 108 being inserted within the sleeve 104.

[0062] In this first configuration, the rotating cylinder 108 is fastened within the first chamber 105' of the sleeve 104 by means of the first retaining plate 112.

[0063] Furthermore, the end relief 108a of the rotating cylinder 108 is inserted within the notch 104a of the bottom wall 104'. Consequently, an axial rotation of the cylinder 108 carried out by means of the key specific for the lock is transferred to the lock mechanisms thus bringing the latter between an open position and a closed position, and vice versa, in order to lock/unlock the wardrobe door.

[0064] Furthermore, the knob 114 is assumed to have been already assembled as shown in Fig. 1. In other words, the spacer 301 is connected to the bottom portion 203 of the support structure 201 after the pegs 304 with springs 305 have been inserted within the respective recesses 306.

[0065] Similarly, the adapter 401 (comprising the extension 413, latch 408 and second retaining plate 416) is inserted within the axial duct 204 of the support structure 201. Particularly, the groove 407 of the adapter 401 is slidably engaged with the respective relief 408 of the duct 204 until this relief 408 is brought into abutment on the stop edge 407'.

[0066] To mount the knob 114 to the wardrobe door from the open position of the lock block 101, the rotating cylinder 108 is first extracted from the sleeve 104 by means of the extraction/insertion key 111. Particularly, by completely inserting this key 111 in the rotating cylinder 108, the retaining plate 112 is retracted within the cylinder 108 thus releasing the latter and allowing the same to be extracted from the chamber 105'.

[0067] Thereafter, the inserting portion 115 of the knob 114 is inserted within the chamber 105' until the abutment wall 303 of the spacer 301 is brought into abutment on the wardrobe door. It should be observed that the orientation of insertion of knob 114 is dictated by the shape of the further relief 403' provided within the adapter device 401 that must match with the shape of the notch 104a that is formed in the bottom wall of the sleeve 104.

[0068] As a consequence of a pressure applied on the knob 114 in the direction of the second arrow F, the inserting portion 115 is thoroughly pushed within the first chamber 105' until the second retaining plate 416 is snap-

locked within the seat arranged therefor, and the knob 114 can no longer axially translate.

[0069] It should be observed that the pressure applied on the knob 114, presses and loads the helical springs 305 of the spacer 301. Consequently, the spacer 301 pressed between the wardrobe door and support structure 201 of the knob 114 tends to be inserted within the latter thus reducing the overall length of the knob 114.

[0070] Advantageously, the spacer 301 allows adapting the knob 114 to doors having varying thicknesses thus contributing to provide a substantially snug firm anchoring between the knob 114 and the door.

[0071] The rotating cylinder 108 is then inserted within the second chamber 200 such as to match the shape of the relief 108a provided on the cylinder with the shape of the notch 415 of the extension 413.

[0072] Particularly, it should be observed that during the step of inserting the rotating cylinder 108, the extraction/insertion key 111 is held inserted in the cylinder 108.

The key 111 will be extracted only when this step is completed in order to allow the first retaining plate 112 to partially protrude from the cylinder 108 and engage the slot 406 of the adapter 401. Thereby, the cylinder 108 results to be locked within the second chamber 200 and the lock device 100 of the invention adopts the second operating condition in Fig. 3.

[0073] Advantageously, in this second operating condition, the lock mechanisms of the device 100 can be directly operated from the open and closed positions (and vice versa) by rotating the knob 114.

[0074] In addition, the device 100 also ensures that the wardrobe doors or drawer units are locked in the closed position.

[0075] Particularly, this is done by rotating the cylinder 108 within the knob 114 by means of the key specific for the lock. In fact, this rotation defines the integral rotation of the extension 413 for activating the translation of the latch 408. In greater detail, the head of the latch 408 is extracted from the adapter 401 and engages within one of the two longitudinal grooves 107 that are provided within the sleeve 104 thus preventing any further rotation of the knob 114.

[0076] As said longitudinal grooves 107 are symmetrical, the rotation of the knob 114 can be similarly locked from an open position of the lock mechanisms.

[0077] Advantageously, the first operating configuration of the lock device 100 of the invention can be restored from the second operating condition.

[0078] In fact, to this purpose, the rotating cylinder 108 is first extracted from the second chamber 200 by means of the extraction/insertion key 111.

[0079] Then, a suitable uncoupling pin 501, as shown in detail in Fig. 6, is inserted within the through hole 413' of the extension 413 such as to pass through the inserting portion 115 of the knob 114 until it reaches the further through hole 403''.

[0080] Particularly, in the vicinity of the second retaining plate 416, a tapered tip 502 of this pin 501 applies a

pressure on said second retaining plate 416 that is sufficient to disengage the latter from the seat being formed within the inner surface of the sleeve 104.

[0081] Thereby, the inserting portion 115 of the knob 114 is released and the knob can be extracted from the sleeve 104.

[0082] The first operating configuration is then completely restored by reintroducing the rotating cylinder 108 within the first chamber 105' that has been cleared of the knob 114.

[0083] Advantageously, the lock device 100 of the invention allows rapidly and easily changing the configuration of the locks for wardrobe doors, or drawer units. In fact, in order to pass from a lock without knob to one provided with a knob, one acts only on those lock components that can be directly reached from the outside of the wardrobe (knob 114, rotating cylinder 108) thus avoiding having to dismantle the whole lock block 101 from the door, unlike what happens with traditional locks.

[0084] Furthermore, this operation of changing the lock configuration can also be carried out by unskilled operators.

[0085] In addition, it should be observed that the device 100 can provide other means for controlling the opening/closure of the lock rather than the relieves 108a and 403' that are provided on the cylinder 108 and adapter device 401, respectively, and notch 104a of the lock block 101. For example, the lock block 101 can comprise a relief suitable to engage with notches that are formed on the cylinder 108 and adapter device 401.

[0086] Obviously, to the lock device of the present invention, those skilled in the art, aiming at satisfying contingent and specific requirements, will be able to carry out further modifications and variations, which are all contemplated within the scope of protection of the invention, such as defined in the claims below.

Claims

1. A lock device (100) for doors, comprising:

- a lock block (101) for at least one door that can be controlled to pass from an open position to a closed position, and vice versa,
- an actuator (108) for the lock block that can be releasably coupled with said block and operated by means of a key for controlling the opening/closing the lock block, said actuator being provided with first engaging means (108a) that can be operatively coupled with counter-engaging means (104a) being provided in the lock block,

characterized in that it further comprises a handle (114) for manual operation that can be releasably coupled to the lock block, said handle comprising second engaging means (403') that can be operatively coupled with the counter-engaging means

(104a) of the lock block in replacement of said first means for controlling the opening/closure of the lock block.

2. The lock device (100) in accordance with claim 1, wherein said first engaging means (108a) of the actuator (108) and said second engaging means (403') of the handle (114) provide a geometric coupling with the counter-engaging means (104a) being provided within the lock block (101).
3. The lock device (100) in accordance with claim 2, wherein the first (108a) and second (403') engaging means include relieves, the counter-engaging means (104a) include notches.
4. The lock device (100) in accordance with claim 1, wherein said second engaging means (403') are suitable for co-operating with said counter-engaging means (104a), in a first operating configuration of the device, in order to transmit a rotary motion of the handle (114) about an axis orthogonal to the lock block (101) to bring the latter from the open position to the closed position, and vice versa.
5. The lock device (100) in accordance with claim 4, wherein in said first operating configuration, the actuator (108) is housed within the handle (114) by being capable of rotating about said axis by means of the key for inhibiting the rotary motion of the knob.
6. The lock device (100) in accordance with claim 4, wherein said second engaging means (403') are arranged within a portion (115) of the handle (114) that can be inserted within a chamber (105') of the lock block (101).
7. The lock device (100) in accordance with claim 6, wherein said inserting portion (115) of the handle (114) comprises means (416, 416') for coupling said portion to an inner surface (106) of the chamber (105') to prevent the axial translation of the knob (114).
8. The lock device (100) in accordance with claim 7, wherein said coupling means are embodied by a retaining plate (416) which is suitable for co-operating with a spring (416') for elastically engaging a respective seat of the inner surface (106) of the chamber (105').
9. The lock device (100) in accordance with claim 6, wherein said inserting portion (115) of the handle (114) includes means (408) for inhibiting the rotation of the handle to lock the lock block (101) in the closed/open position.
10. The lock device (100) in accordance with claim 9,

wherein said inhibition means (408) can be operated by rotating the actuator (108) housed within the handle (114).

11. The lock device (100) in accordance with claim 10, wherein said inhibition means are embodied by a latch block (408) that can be extracted from the inserting portion (115) of the handle (114) in order to engage a longitudinal groove (107) being provided within the chamber (105'). 5
12. The lock device (100) in accordance with claim 11, wherein the handle (114) comprises cam means (413) that are interposed between the latch block (408) and the actuator (108) to transfer the rotary motion of the actuator to the latch block. 10
13. The lock device (100) in accordance with claim 1, wherein said handle (114) includes elastically yielding means (301) for adapting to a door thickness. 15
14. The lock device (100) in accordance with claim 13, wherein said adapting means (301) can be interposed between a support structure (201) of the handle (114) and said door. 20
15. The lock device (100) in accordance with claim 14, wherein the adapting means (301) comprise a base element (302) that is intended to be abutted against the door and a plurality of pegs (304) that are provided with helical counter-springs (305) to be inserted within said support structure (201). 25
16. The lock device (100) in accordance with claim 1, wherein said handle (114) comprises a cylindrical body (402) suitable to house the adapter (108) and connected to said inserting portion (115). 30
17. The lock device (100) in accordance with claim 6, wherein in a second operating configuration of the device, the actuator 108 is housed within the chamber (105') of the lock block (101), said actuator being capable of being extracted from the chamber by means of a extraction/insertion key (111). 35
18. The lock device (100) in accordance with claim 17, wherein the actuator (108) comprises further means (112) for coupling to the inner surface of the chamber (105') in the second operating configuration and to the cylindrical body (402) of the handle (114) in the first configuration, said further means preventing the actuator from axially translating in both configurations. 40
19. The lock device (100) in accordance with claim 18, wherein said further coupling means are embodied in a further retaining plate (112) that can be extracted from/retracted within said actuator (108). 45

20. The lock device (100) in accordance with at least one of preceding claims, wherein said actuator (108) is a plate cylinder (109).

21. The lock device (100) in accordance with at least one of preceding claims, wherein the lock block (101) includes lock mechanisms comprising elements suitable for preventing the opening movement of the doors, such as a latch, spring latch, vertically sliding or rotating rods. 5
22. The lock device (100) in accordance with at least one of preceding claims, wherein said handle is a knob (114). 10
23. The lock device (100) in accordance with at least one of the preceding claims, wherein said handle (114) comprises an outer surface (201) being provided with ergonomic notches (205) to facilitate grasping the handle. 15

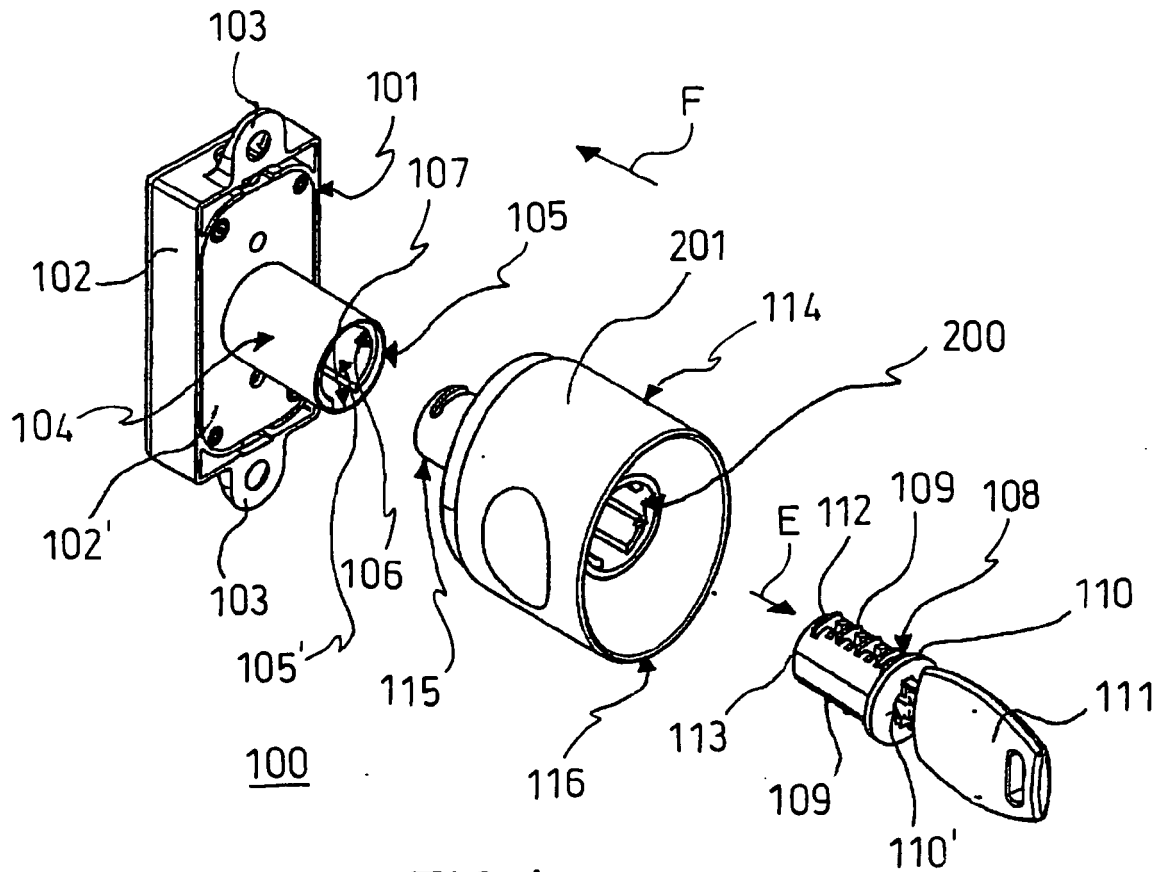


FIG.1

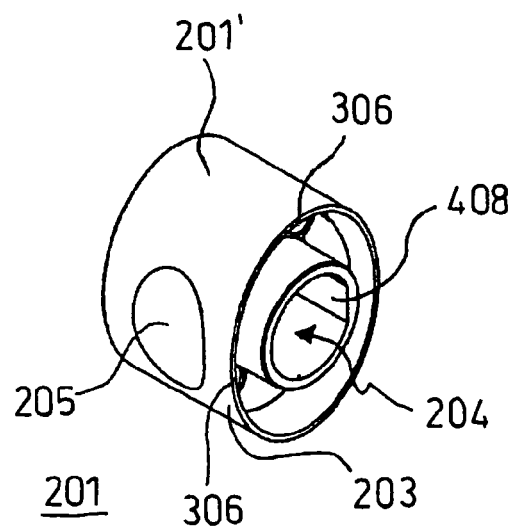


FIG.4

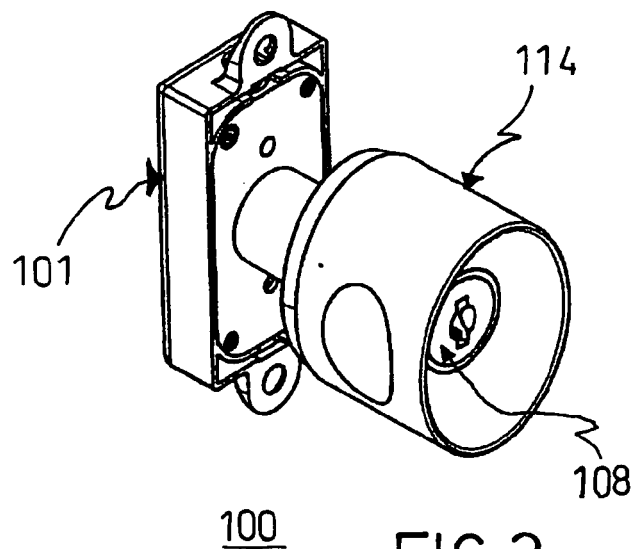
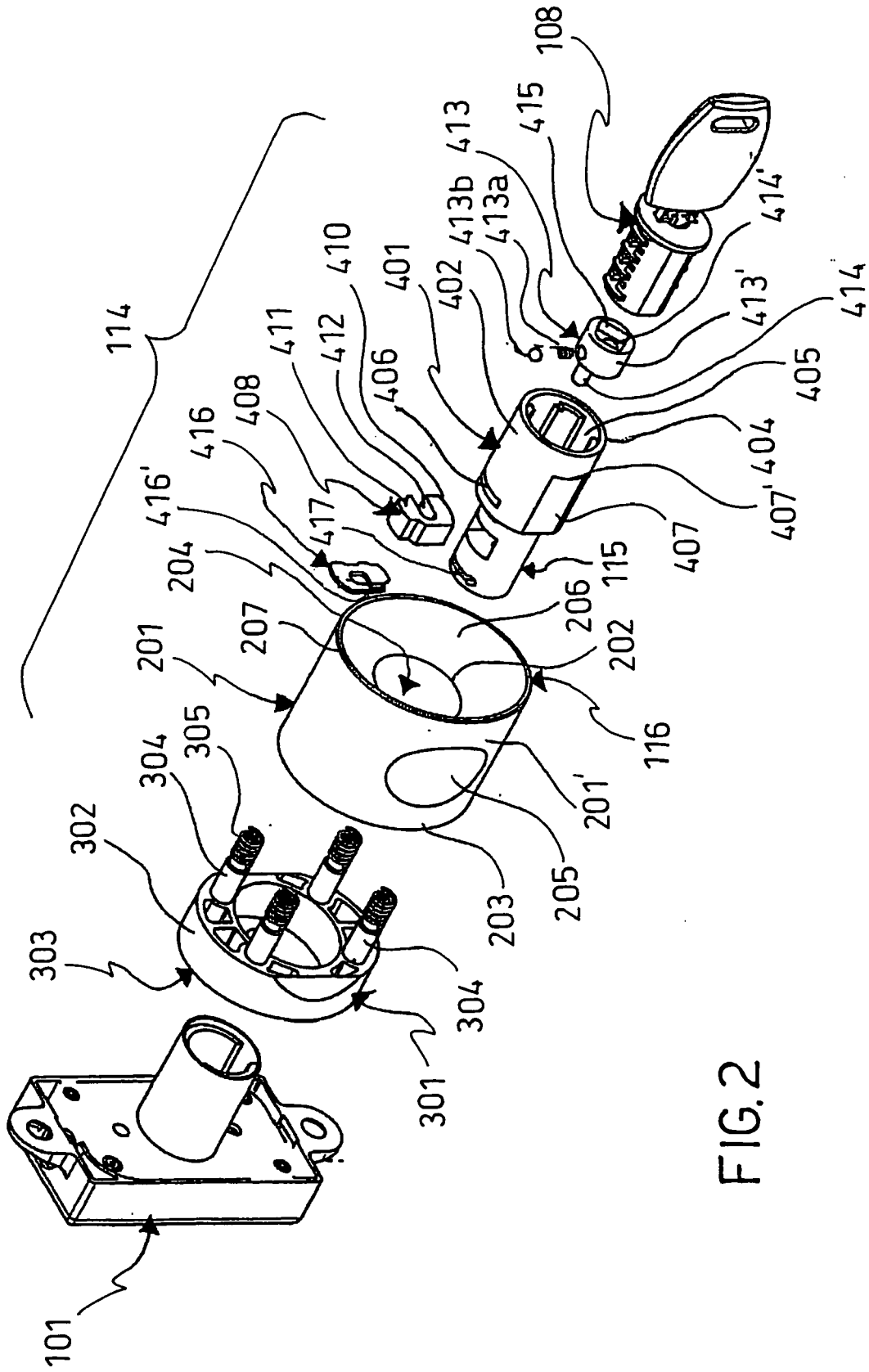


FIG.3



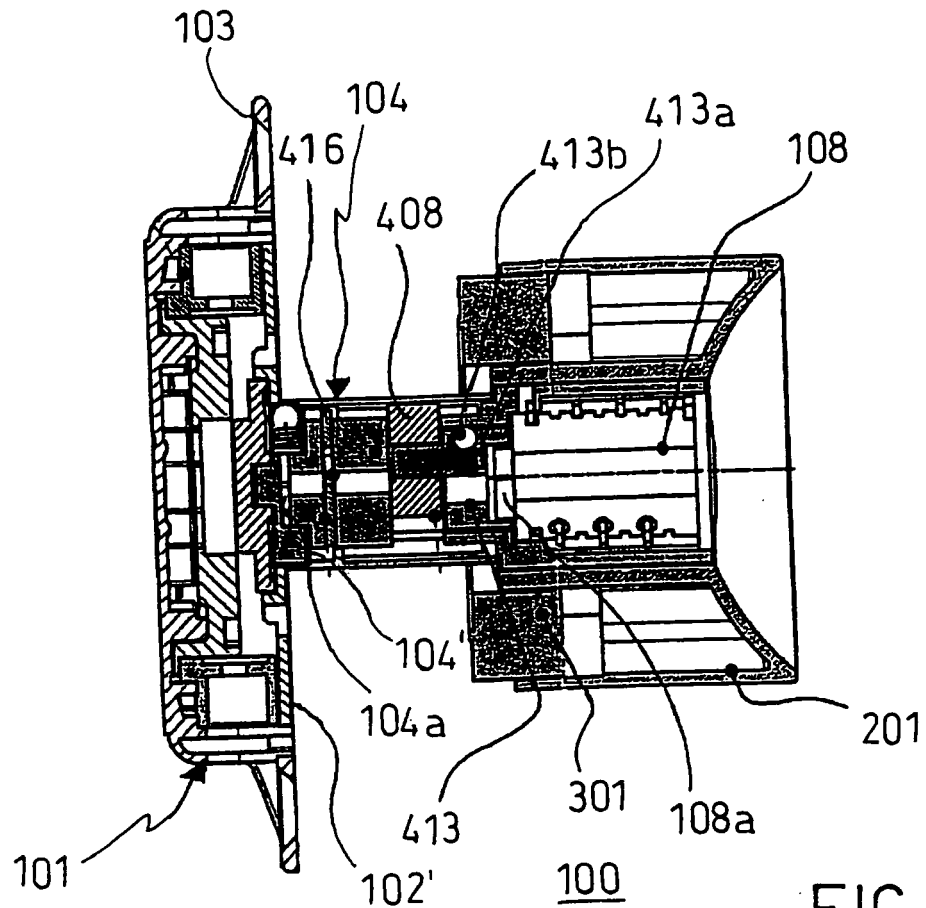


FIG. 5

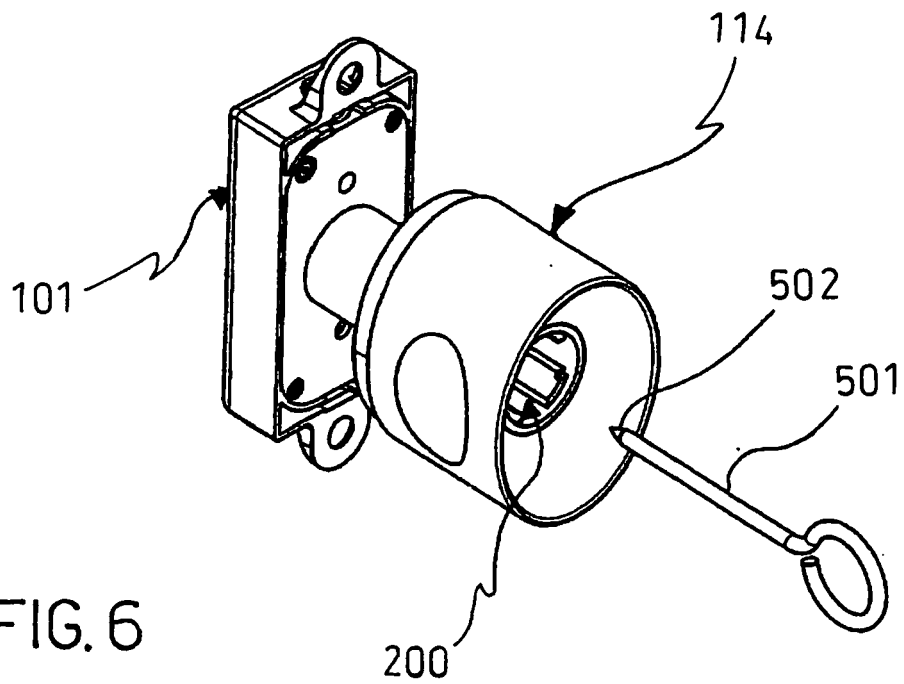
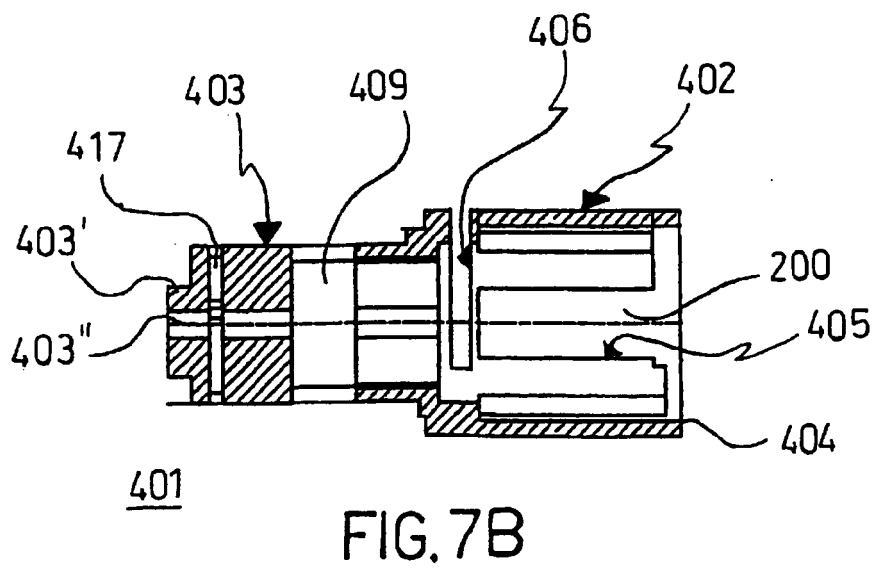
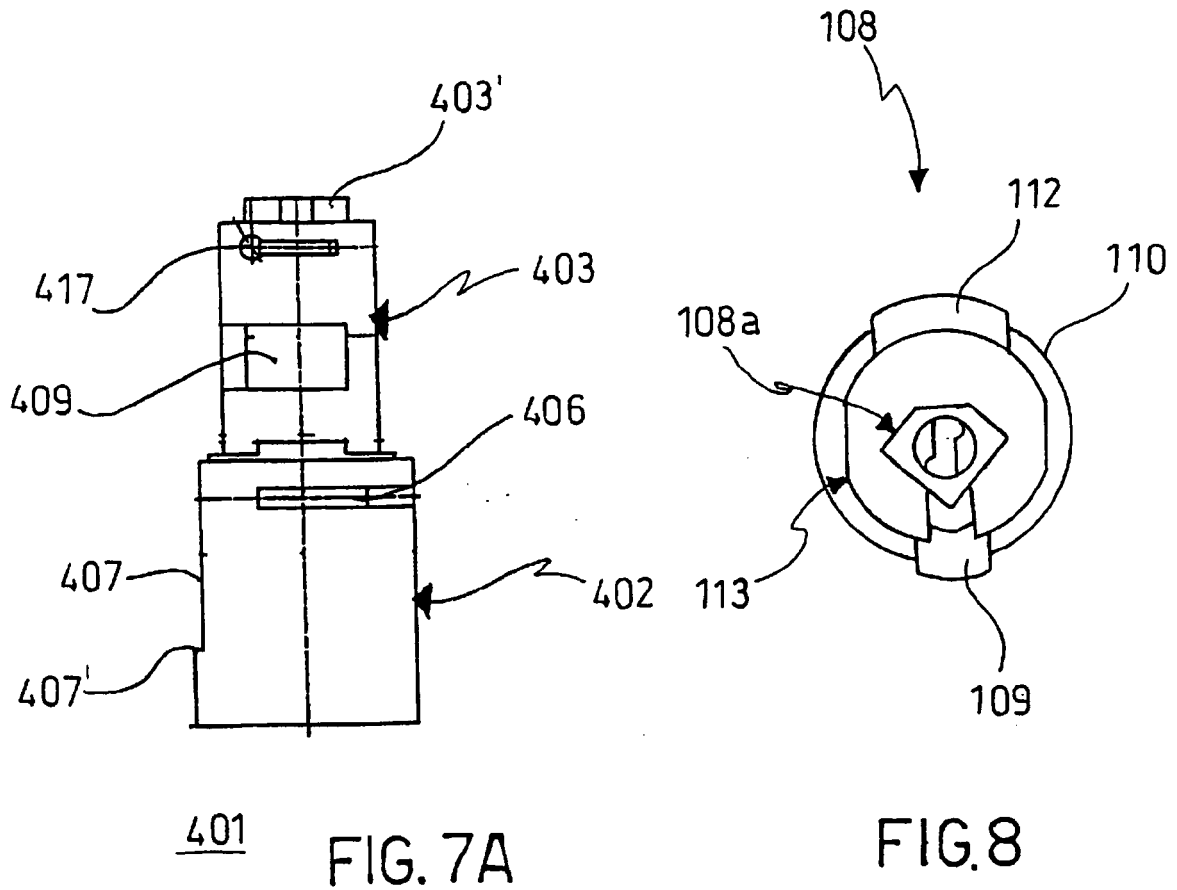


FIG. 6





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
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Place of search Munich		Date of completion of the search 26 April 2007	Examiner Friedrich, Albert
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