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(54) DEVICE FOR PROTECTING A SAFETY LOCK

(57) Described herein is a protection device (10) for a safety lock applied to a door or window, of the type comprising:

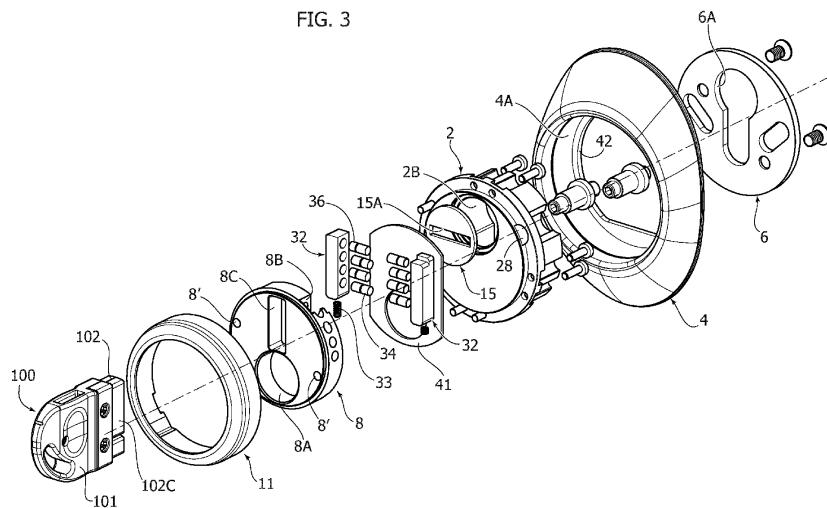
- a protection structure (2; 4), which is provided for being fixed to an outer side of the door or window so as to cover said safety lock, and which defines an opening (2B) through which it is possible to access said lock with an operating key;
- an open/close member (8) rotatable about an axis of rotation (I) with respect to the protection structure (2, 4) between a first position in which it closes said opening (2B) with respect to the outside, and a second position

in which it is possible to access said safety lock through said opening (2B);

- a blocking system, which can be actuated via key (100) operating as a result of a magnetic field, which is provided for blocking said open/close body (8) in said first position and for enabling displacement of said open/close body (8) into said second position, as a result of an interaction via a magnetic field between said key (100) and said blocking system.

The blocking system of the device presents a high degree of security in regard to attempts at forcing the lock made using magnetic means.

FIG. 3



DescriptionField of the invention

[0001] The present invention relates to a device for protecting a safety lock applied to a door or window, of the type comprising:

- a protection structure, which is provided for being fixed to an outer side of the door or window so as to cover the safety lock and defines an opening through which it is possible to access the lock with an operating key;
- an open/close body, which can turn about an axis of rotation between a first position, in which it closes the aforesaid opening with respect to the outside, and a second position in which it is possible to access the safety lock through the aforesaid opening; and
- a blocking system, which can be actuated via a key that operates as a result of a magnetic field and which is provided for blocking the aforesaid open/close body in the aforesaid first position and for enabling displacement of the open/close body into the aforesaid second position as a result of an interaction via a magnetic field between the aforesaid key and the aforesaid blocking system.

Prior art

[0002] As is known, such a device has the function of preventing access to the lock and, in particular, to its internal passage for introduction of the key in order to prevent any attempts to force the lock.

[0003] The blocking system referred to, which blocks or enables movement of the open/close body from the closing position to the opening position, is provided with magnetic-coding means designed to co-operate with an actuation key that accordingly presents a code of a magnetic type.

[0004] The documents EP 2525023B1 and IT 273011 describe two known solutions of a device for protecting a safety lock that envisage magnetic-coding means comprising magnets arranged according to a planar distribution in a generic plane parallel to the front side of the device, and mobile either in directions orthogonal to the aforesaid plane or else according to movements of rotation about axes orthogonal to the aforesaid plane. Such solutions envisage the use of an actuation key likewise provided with magnets, which are also arranged according to a planar distribution, in a plane that in operation is set parallel to the front side of the device.

Object and summary of the invention

[0005] In this context, the object of the present invention is to provide an improved protection device that will present at least one or more of the following advantages:

- a higher degree of security in regard to attempts at forcing the lock using magnets;
- a greater ease of use;
- a greater resistance to attempts at forcing the lock using drilling tools; and
- a greater adaptability to various conditions of installation.

[0006] One or more of the above objects are achieved via a device that presents the characteristics of Claim 1.

[0007] In general, the protection device described herein is characterized in that the open/close member has an internal passage for introduction of a key for actuation of the device, and in that the blocking system comprises:

- a blocking member, which is driven by an elastic element into an operating position in which it prevents rotation of the open/close body from the first position to the second position and can be moved into a position of release whereby the open/close member is free to move from the first position to the second position;
- a series of first pins, which are mounted so that they can slide in a plane transverse to the axis of rotation of the open/close member, and in respective mutually parallel directions, within respective holes provided in said open/close member;
- a series of second pins, which are mounted so that they can slide in a plane transverse to the axis of rotation of the open/close member, and in respective mutually parallel directions, within respective holes provided in said blocking member in positions corresponding to those of said holes provided in said open/close member, in such a way that, in said operating position of the blocking member, the holes of said open/close member and the holes of said blocking member are mutually aligned,

wherein said first and second pins are designed to co-operate with one another so that at least some of said first and/or second pins will arrange themselves astride of the respective holes of said open/close member and of said blocking member, thus blocking movement of the blocking member; and wherein said first and/or second pins are constituted by, or include, magnets, and wherein said magnets have poles oriented in a pre-set way so that, through insertion, within said internal passage in said open/close member, of a key provided with magnets that have a given distribution and a given orientation, said first and second pins position themselves, inside the respective holes, in a condition where displacement of the blocking member from the operating position to the position of release is enabled.

[0008] In view of the foregoing, the protection device described herein has magnet pins that are linearly mobile

in a plane transverse to the axis of rotation of the open/close member and in mutually parallel directions contained in the aforesaid plane.

[0009] The above configuration guarantees an effective protection in regard to attempts at forcing the lock made by manoeuvring magnetic means at the front side of the device to attempt to reconstruct the correct code of the blocking system in so far as there is no possibility of moving the individual magnets of the blocking system in the aforesaid parallel directions by acting from the front side of the device.

[0010] Instead, the known solutions described at the start are completely unprotected in regard to attempts at effraction of this type.

[0011] The protection device described herein is consequently more secure.

[0012] The present invention moreover regards an actuation key according to Claim 10.

Brief description of the drawings and detailed description of one or more embodiments of the invention

[0013] Further characteristics and advantages of the invention will emerge clearly from the ensuing description with reference to the annexed drawings, which are provided purely by way of non-limiting example and in which:

- Figure 1 illustrates a preferred embodiment of the device described herein, according to a front view;
- Figure 2 is a lateral view of the device of Figure 1;
- Figure 3 is an exploded view of the device of Figure 1, from the front side;
- Figure 4 is a front view in partial cross section of the device of Figure 1;
- Figure 5 is an exploded view of the device of Figure 1, from the rear side;
- Figure 6 illustrates a situation of installation of the device of Figure 1;
- Figures 7A, 7B, and 7C illustrate further examples of the device described herein and of the corresponding actuation key;
- Figure 8 is a front view in partial cross section of a further embodiment of the device described herein; and
- Figure 9 illustrates a key for actuation of the device of Figure 8.

[0014] In the ensuing description, various specific details are illustrated aimed at providing an in-depth understanding of the embodiments. The embodiments may be obtained without one or more of the specific details, or with other methods, components, or materials, etc. In other cases, known structures, materials, or operations are not illustrated or described in detail so that various aspects of the embodiment will not be obscured.

[0015] The references used herein are provided merely for convenience and hence do not define the sphere of protection or the scope of the embodiments.

[0016] As anticipated above, the solution described herein regards a device for protecting a safety lock applied to a door or window.

[0017] In general, the device described herein comprises:

- a protection structure, which is provided for being fixed to an outer side of the door or window so as to cover the safety lock and defines an opening through which it is possible to access the lock with an operating key;
- an open/close body, which can turn about an axis of rotation between a first position in which it closes the aforesaid opening with respect to the outside, and a second position, in which it is possible to access the safety lock through the aforesaid opening;
- a blocking system, which can be actuated via a key that operates as a result of a magnetic field and which is provided for blocking the aforesaid open/close body in the aforesaid first position and for enabling displacement of the open/close body into the aforesaid second position as a result of an interaction via a magnetic field between the aforesaid key and the afore said blocking system.

[0018] With reference to the preferred embodiment illustrated in the figures, the protection device - designated as a whole by the reference number 10 - comprises a protection structure 20 formed by:

- a base body 2, which is provided with a seat 2A designed to house the lock (not illustrated) and is to be received within a housing S provided on an outer panel of the door leaf, and, in this position, to be fixed to the leaf (Figure 5);
- a covering body 4, which is provided with an opening 4A for insertion of the base body 2 and is to surround the base body 2.

[0019] In preferred embodiments, as in the one illustrated, the base body 2 is constituted by a cylindrical body made of metal material, for example high-strength carburized steel, provided on the inside of which (with reference to the condition of installation) is the shaped seat 2A.

[0020] Provided, instead, on the front side of the body 2 is an opening 2B, of a circular shape, for insertion of the operating key into the lock.

[0021] In preferred embodiments, as in the one illustrated, the opening 2B is engaged by a rotary disk 15 having a slit 15A for insertion of the key, which is to turn together with the key during its actuation and has the function of further covering the lock from outside.

[0022] Provided on the rear side of the base body 2 are threaded holes 22 for fixing, using screws, the base body 2 to the leaf.

[0023] In preferred embodiments, as in the one illus-

trated, the base body 2 is fixed to the leaf via interposition of a plate 6 provided with a central opening 6A shaped for receiving the cylinder lock and, moreover, openings 6B and 6C for the passage of screws for fixing the base body 2 to the leaf and for fixing the plate 6 itself to the base body 2. In this regard, also provided on the rear side of the base body 2 are threaded holes 24 for fixing the plate 6 using screws.

[0024] In preferred embodiments, as in the one illustrated, the covering body 4 defines with its central opening 4A a substantially cylindrical seat received in which is the base body 2.

[0025] The body 4 has the function of covering the boundary region between the panel of the leaf and the base body 2 from outside so as to close any possible gaps present between these two elements.

[0026] Possibly, there may be coupled - for example, slotted - to the base body 2 and to the covering body 4 decorative plaques 2', 4' for a purely aesthetic purpose.

[0027] Rotatably mounted on the base body 2 is an open/close member 8, which is disk-shaped and is provided with an opening 8A for insertion of the key for operating the lock.

[0028] In preferred embodiments, as in the one illustrated, the open/close member 8 is constrained to the base body 2 by way of a retention ring 11 that is fixed via screws to the base body 2.

[0029] The open/close member 8 is rotatable about an axis of rotation I between a first position, in which it closes the opening 2B of the base body 2, and a second position, in which its opening 8A is aligned with the opening 2B and the safety lock is hence accessible via the corresponding operating key.

[0030] As anticipated above, the device 10 envisages a blocking system, which can be actuated via a key that operates as a result of a magnetic field, which is provided for blocking the open/close body 8 in the aforesaid first position and for enabling displacement of the open/close body into the aforesaid second position as a result of an interaction between the aforesaid key and the blocking system.

[0031] In this connection, the open/close body 8 carries on it at least one blocking member 32 to prevent rotation of the open/close body 8 with respect to the base body 2, and coding means of a magnetic type that are provided for enabling or disabling the function of the blocking member 32.

[0032] In the example illustrated, provided on the open/close member 8 are two blocking members 32. Described in detail hereinafter is just one of the two members and the corresponding coding means that co-operate therewith.

[0033] The blocking member 32 is positioned mobile in a direction Y contained in a plane orthogonal to the axis of rotation I, within an elongated cavity 8B of the open/close member 8, which gives out laterally on the outside of the member itself. A spring 33 urges the blocking member 32 into a position where it projects laterally

from the open/close member 8 and thus engages a cavity 11A provided on the inner rim of the retention ring 11.

[0034] A series of first pins 34 are mounted so that they are able to slide in a plane transverse to the axis of rotation I and in respective directions parallel to one another and orthogonal to the direction Y, within respective holes 35 provided in the open/close member 8.

[0035] A series of second pins 36 are mounted so that they are able to slide in the same plane and in respective directions parallel to one another and orthogonal to the direction Y, within respective holes 37 provided in the blocking member 32 in positions corresponding to those of the holes 35 provided in the open/close member 8, in such a way that, in the aforesaid projecting position of the blocking member 32, the holes 35 of the open/close member and the holes 37 of the blocking member are mutually aligned, and the corresponding pins 34, 36 can co-operate with one another.

[0036] The pairs of pins 34, 36 are pre-arranged for preventing the blocking member 32 from moving from the projecting position referred to. In this way, the blocking member 32 that engages the cavity 11A of the ring 11 in turn prevents the open/close member 8 from moving from its first position, where it closes the opening 2B.

[0037] In particular, the pins 34, 36 of each pair are positioned so that one of the two pins is set astride of the two aligned holes 35, 37, thus intercepting the blocking member 32 and preventing movement thereof in the direction Y.

[0038] It should now be noted that one of the two pins is constituted by a magnet, whereas the other pin is made of ferromagnetic material so as to remain always in contact with the first pin. The magnet pin has the two magnetic poles in a direction that is contained in the plane orthogonal to the axis of rotation I and is orthogonal to the direction Y.

[0039] The device 10 is pre-arranged for being operated with an actuation key 100 designed to interact with the pins 34, 36 as a result of a magnetic field so as to bring the two pins 34, 36 flush with the interface between the open/close member 8 and the blocking member 32 so that the member 32 is no longer prevented from translating in the direction Y.

[0040] In this connection, the magnet pins of all the pairs of pins 34, 36 have the respective poles oriented according to a predefined pattern that determines the "magnetic" coding of the device.

[0041] The actuation key 100 will have to envisage a corresponding series of magnets oriented according to a predefined pattern to displace the different pairs of pins 34, 36 as referred to above.

[0042] The open/close member 8 has an internal passage 8C for introduction of the actuation key 100, which is preferably in the proximity of the pins 34 so as to favour magnetic interaction between the pins 34, 36 and the magnets arranged on the key.

[0043] Once the pins 34, 36 are positioned flush with the interface between the open/close member 8 and the

blocking member 32, the latter is made to enter into the open/close body 8 as a result of rotation of the open/close body 8 about the axis of rotation I. For this purpose, the walls of the cavity 11A of the retention ring 11 have an inclination and/or a conformation such that they are able to exert an action of thrust on the blocking member 32 towards the inside of the open/close member 8 as a result of the movement of rotation of the member itself 8 about the axis of rotation I.

[0044] The movement of rotation of the open/close member 8 is determined by rotation of the actuation key itself. The internal passage 8C of the open/close member 8 and the active portion 102 of the key that is inserted therein hence have complementary shapes such as to constrain the two components in rotation.

[0045] The same configuration described above is reproduced also for the second blocking member 32 carried by the open/close member 8.

[0046] In preferred embodiments, as in the one illustrated, the second blocking member 32 and the corresponding pins 34, 36 are arranged on the opposite side of the internal passage 8C and according to a substantially specular configuration, so as to be able to interact with the same actuation key inserted into the cavity 8C.

[0047] As has been seen above, the base body 2 is preferably made of a high-strength carbonitrided steel. Hence, preferably set between the base body 2 and the open/close body 8 is an element 41 designed to shield or insulate magnetically the magnets of the pins 34, 36 from the base body 2.

[0048] Figure 3 represents an example of the key 100 for actuation of the device 10. It comprises a grip 101 and an active portion 102 configured for being inserted into the internal passage 8C of the open/close member 8. The active portion 102 comprises a wall 102A (Figure 4) arranged on the opposite faces of which are the magnets 102B that are to interact with the pins 34, 36 that control the position of the two blocking members 32. In the condition where the active portion 102 is inserted in the internal passage 8C, the wall 102A is located parallel to the axis of rotation I of the open/close member 8 and parallel to the direction Y. The active portion 102 may further comprise an outer shell 102C, preferably made of plastic material, which encloses inside it the wall 102A and the magnets 102B. In preferred embodiments, the outer shell 102C has a shaped profile, preferably with recesses and/or projections, complementary to a shaped section of the internal passage 8C of the open/close member; this shaped section of the internal passage 8C defines a mechanical coding additional to the one magnetic determined by the pins 34, 36, so that only one key having the same shaped profile can be inserted into the internal passage 8C. In this connection, Figures 7A, 7B, and 7C illustrate a series of examples in which the outer shell 102 and the internal passage 8C have sections of various profile.

[0049] It should now be noted that pins 34, 36 may be provided in a number of planes orthogonal to the axis of

rotation I, this in order to make available a larger number of coding combinations.

[0050] The blocking system described above of the device 10 presents total security in regard to attempts at forcing the key referred to at the start, where magnetic means are manoeuvred on the front side of the device to attempt to reconstruct the magnetic code of the system in so far as the particular arrangement of the pins 34, 36 prevents these from possibly being moved via an action of this type.

[0051] Moreover, precisely on account of the low susceptibility of these pins to any magnetic interaction with elements arranged in different planes parallel to the front side, it is also possible to make the base body 2 of a high-strength material that presents ferromagnetic characteristics, without thereby jeopardizing proper operation of the aforesaid pins. As has been seen above, it is possible in any case to provide an element 41 for magnetically shielding or insulating the pins 34, 36 from the base body 2.

[0052] In preferred embodiments, as in the one illustrated, the device 10 comprises means for adjusting the relative position between the base body 2 and the covering body 4 along the axis of rotation I of the open/close member.

[0053] In preferred embodiments, as in the one illustrated, these means comprise at least one spacer member 12 constituted by a screw 13 that can be freely turned, and a pusher element 14, which is mounted on the screw and is constrained so as to be mobile along the screw as a result of turning of the latter.

[0054] The above member 12 is set between the base body 2 and the covering body 4 according to a condition where the axis of the screw is oriented parallel to the axis of rotation I, and the pusher element 14 engages the covering body 4 so as to define a given relative position between the base body 2 and the covering body 4.

[0055] Rotation of the screw 13 determines movement of the pusher element along the axis of rotation I and thus enables adjustment of the relative position between the base body 2 and the covering body 4.

[0056] In preferred embodiments, as in the one illustrated, the device comprises a plurality of such spacer members 12 distributed along the lateral surface of the base body 2.

[0057] In preferred embodiments, like the one illustrated, the individual spacer member 12 is housed within a recess 26 provided in the lateral surface of the base body 2.

[0058] The recess 26 extends in a direction parallel to the axis of rotation I, preferably starting from the rear side of the body 2 and for a length that may vary from case to case, according to the requirements of the specific applications.

[0059] The screw 13 bears upon the bottom of the recess (not visible), which is set in a plane substantially orthogonal to the axis of rotation I and is contained between the bottom of the recess and the plate 6. Holes 8'

and 28 provided in corresponding positions on the open/close member 8 and on the body 2, respectively, render the screw accessible from the front side of the device to carry out the adjustment referred to via the spacer member 12. Preferably, the holes 8 are aligned with the holes 28 when the open/close member 8 is brought into an intermediate position between the first and second positions referred to above.

[0060] The pusher element 14 is set within the aforesaid recess according to a shape fit that enables it to slide with respect to the walls of the recess, but not to turn.

[0061] Preferably, the above recess has a non-circular profile, and the pusher element 14 has a cylindrical portion, which is internally threaded, radially projecting from which is a flange 14A, which also has a non-circular profile and which is coupled, along its perimetral edge, with the walls of the recess 26. Preferably, the flange 14A has a portion that reproduces the entire profile of the recess 26.

[0062] In preferred embodiments, like the one illustrated, the flange 14A moreover has a portion that projects beyond the lateral surface of the base body 2, thus engaging with an annular rim 42 of the covering body 4, which in turn projects towards the inside of the opening 4A.

[0063] In summary, the screw 13 of the spacer member is carried by the base body 2, and the pusher element 14, which is carried by the screw 13, engages the covering body 4, thus defining the relative position of the latter with respect to the base body 2.

[0064] The relative position between the two bodies 2 and 4 is thus determined by the position of the pusher element 14 along the screw 13 and can be adjusted through rotation of the screw itself.

[0065] With reference to installation of the device 10 (see Figure 6), the base body 2 is set against the bottom of the housing S provided in the leaf to cover the cylinder lock and fixed in this position via screws that will then be inserted into the threaded holes of the base body.

[0066] At the moment of installation, the spacer members 12 of the device will be adjusted so as to position the pusher elements 14 into the position closest to the front side of the base body 2, enabling the covering body 4 to move into the maximum forward position.

[0067] The covering body 4 will hence be still detached from the panel of the leaf.

[0068] The technical operator will then turn the screws 13 to operate the pusher elements 14 and thereby push the covering body 4 against the leaf.

[0069] In preferred embodiments, as in the one illustrated, the base body 2 and the covering body 4 have within their structure reinforcing bodies 90 housed within corresponding cavities provided in the two bodies 2, 4 (visible in Figure 5 are the bodies 90 inserted in the covering body 4). These elements are made of a high-hardness metal alloy, for example hardened chromium steel.

[0070] It is pointed out that, thanks to the fact that the actuation key 100 has a prevalent encumbrance in the

plane coinciding with the wall 102A of its active portion, the key 100 can be operated freely without any risk of interference with the covering body 4 whatever the relative position between the latter and the base body 2 and, in particular, even when the covering body 4 is set in the maximum forward position.

[0071] With reference now to Figure 8, the protection device 10 illustrated therein differs in that two pairs of pins 34, 36 have been replaced with non-magnetic pins 134, 136, which operate in another way, as illustrated hereinafter.

[0072] With reference to the single pair, the pins 134, 136 are mounted so that they can slide in the respective holes 35, 37 and are urged by an elastic element 135 that engages the pin 136 directly in a position where the pin 136 is located astride of the two holes 35, 37, thus intercepting the blocking member 32 and preventing movement thereof in the direction Y. On the other hand, the pin 134 is located in a position where it projects into the internal passage 8C of the open/close member 8.

[0073] According to this embodiment, the actuation key 100 (see Figure 9) has on its outer shell 102C a notch 137 provided for receiving the pin 134 so as to bring the two pins 134, 136 flush with the interface between the open/close member 8 and the blocking member 32 so that the member 32 will no longer be prevented from translating in the direction Y.

[0074] In view of the foregoing, it will be understood that the two pins 134, 136 perform a blocking function in a way similar to the one described above with reference to the pins 34, 36; on the other hand, unlike the latter, they define for the blocking system a "mechanical" coding and not a magnetic coding.

[0075] These mechanical-coding pins may be provided instead of some of the magnetic-coding pins 34, 36, as in the embodiment of Figure 8, or else may be provided in addition thereto, according to the requirements of the specific applications.

[0076] In some alternative embodiments, the pins 134, 136 may be provided in a plane orthogonal to the axis of rotation I different from the one in which the magnetic-coding pins 34, 36 are able to slide.

[0077] Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary, even significantly, with respect to what has been illustrated herein purely by way of non-limiting example, without thereby departing from the scope of the invention, as defined by the annexed claims.

Claims

1. A protection device (10) for a safety lock applied to a door or window, of the type comprising:
 - a protection structure (2; 4), which is provided for being fixed to an outer side of the door or window so as to cover said safety lock and de-

fines an opening (2B) through which it is possible to access said lock with an operating key;

- an open/close member (8), which can turn about an axis of rotation (I) with respect to the protection structure (2, 4) between a first position where it closes said opening (2B) with respect to the outside, and a second position where it is possible to access said safety lock through said opening (2B); and

- a blocking system, which can be actuated via a key (100) operating as a result of a magnetic field, which is provided for blocking said open/close member (8) in said first position and for enabling displacement of said open/close member (8) into said second position, as a result of an interaction via a magnetic field between said key (100) and said blocking system, said device being **characterized in that** said open/close member (8) has an internal passage (8C) for introduction of a key (100) for actuation of the device, and **in that** said blocking system comprises:

- a blocking member (32) urged by an elastic element (33) into an operating position where it prevents rotation of the open/close body (8) from the first position to the second position, and can be moved into a position of release whereby the open/close member (8) is free to move from the first position to the second position;

- a series of first pins (34), which are mounted so that they can slide in a plane transverse to the axis of rotation (I) of the open/close member (8), and in respective mutually parallel directions, within respective holes (35) provided in said open/close member (8);

- a series of second pins (36), which are mounted so that they can slide in a plane transverse to the axis of rotation (I) of the open/close member (8), and in respective mutually parallel directions, within respective holes (37) provided in said blocking member (32) in positions corresponding to those of said holes (35) provided in said open/close member (8), in such a way that, in said operating position of the blocking member (32), the holes (37) of said open/close member (8) and the holes (35) of said blocking member (32) are mutually aligned, wherein said first and second pins (34, 36) are designed to co-operate with one another so that at least some of said first and/or second pins (34, 36) will arrange themselves astride of the respective holes (35, 37) of said open/close member (8) and of said blocking member (32), thus blocking movement of the blocking member (32); and

wherein said first and/or second pins (34, 36) are constituted by, or include, magnets, and wherein said magnets have poles oriented in a

pre-set way so that, through insertion within said internal passage (8C) in said open/close member (8) of a key (100) provided with magnets that have a given distribution and a given orientation, said first and second pins (34, 36) position themselves, inside the respective holes, in a condition where the displacement of the blocking member (32) from the operating position to the position of release is enabled.

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2. The device according to Claim 1, wherein said protection structure comprises:

- a base body (2), which is provided with a seat (2A) designed to house said lock and is to be fixed to said door or window within a housing (S) provided on an outer panel of said door or window;
- a covering body (4), which is to surround said base body (2), which is provided with an opening (4A) for housing said base body (2); and
- means for adjusting the relative position between said base body (2) and said covering body (4), along the axis of rotation (I) of the open/close member (8), according to the thickness of said panel.

3. The device according to Claim 1, wherein said open/close member (8) is rotatably mounted on said base body (2).

4. The device according to Claim 3, wherein said open/close member (8) is positioned on a front side of the base body (2) opposite to said seat (2A) and is constrained to the base body (2) by way of a retention ring (11) fixed to the front side of the base body (2).

5. The device according to Claim 3, wherein said blocking member (32) is mounted mobile on said open/close member (8) between a position projecting laterally from said open/close member, in which it engages a cavity (11A) of said retention ring (11) and which corresponds to said operating position, and a position in which said blocking member (32) is completely inside said open/close member (8) and which corresponds to said position of release.

6. The device according to Claim 5, wherein the walls of the cavity (11A) of the retention ring (11) have an inclination and/or a conformation such that they are able to exert an action of thrust on the blocking member (32) towards the position of release, as a result of the movement of rotation of the open/close member (8) about the axis of rotation (I).

7. The device according to any one of the preceding claims, wherein said base body (2) is made of a fer-

romagnetic material and wherein set between said base body (2) and said open/close body (8) is an element (41) for shielding or insulating magnetically the magnets of said first and second pins (34, 36) from the base body (2) made of ferromagnetic material.

8. The device according to any one of the preceding claims, wherein said blocking member (32) is mobile in a direction (Y) contained in a plane transverse to the axis of rotation (I) of the open/close member (8), and said magnets have the two magnetic poles in a direction that is contained in the plane transverse to the axis of rotation (I) and is transverse to the direction (Y).

9. The device according to any one of the preceding claims, wherein said blocking system further comprises:

- at least one third pin (134), which is mounted so that it can slide in a plane transverse to the axis of rotation (I) of the open/close member (8), and in a direction parallel to the directions in which the first pins are mobile (34), within a further hole (35) provided in said open/close member (8);
 - at least one fourth pin (136), which is mounted so that it can slide in a plane transverse to the axis of rotation (I) of the open/close member (8) and in a direction parallel to the directions in which the second pins (36) are mobile, within a further hole (37) provided in said blocking member (32) in a position corresponding to that of said further hole (35) provided in said open/close member (8), in such a way that, in said operating position of the blocking member (32), the further hole (35) of the open/close member and the further hole (37) of the blocking member are mutually aligned,

wherein said third and fourth pins (134, 136) are urged by an elastic element (135) into a position in which the fourth pin (136) sets itself astride of the further hole (35) of the open/close member (8) and of the further hole (37) of the blocking member (32) and where the third pin (134) projects in the internal passage (8C) for introduction of a key (100) for actuation of the device, so that insertion of an actuation key into said internal passage (8C) will cause displacement of the third and fourth pins (134, 136) as far as a position in which the third and fourth pins (134, 136) are contained, respectively, within the further hole (35) of the open/close member (8) and the further hole (37) of the blocking member (32) and are flush with the ends of the corresponding holes so as to enable displacement of the blocking member (32) from the operating position to the position of

release.

5 10 15 20 25 30 35 40 45 50 55

10. A key (100) for actuation of a protection device according to any one of the preceding claims, said key comprising a grip (101) and an active portion (102) configured for being inserted into the internal passage (8C) of the open/close member (8), wherein the active portion (102) comprises a wall (102A), there being carried on at least one of the two opposite faces of said wall (102A) magnets (102B) designed to interact with the pins (34, 36) of the device (10), wherein said magnets (102B) each have the two magnetic poles in a direction that is orthogonal to the wall (102A) in the condition where the key is inserted into the internal passage (8C) of the open/close member (8), said wall (102A) being set orthogonal to the directions of movement of the pins (34, 36).

11. The key according to Claim 10, wherein the active portion (102) may moreover comprise an outer shell (102C) that encloses inside it the wall (102A) and the magnets (102B).

12. The key according to Claim 11, wherein the outer shell (102C) has a shaped profile, preferably provided with projections and recesses, which is complementary to a shaped profile of the internal passage (8C) of the open/close member (8).

13. The key according to Claim 11, wherein the outer shell (102C) comprises a notch (137) provided for receiving, in the condition where the key is inserted in the internal passage (8C) of the open/close member (8), the third pin (134) of the blocking system in a position such that the third and fourth pins (134, 136) are contained, respectively, within the further hole (35) of the open/close member (8) and the further hole (37) of the blocking member (32) and are flush with the ends of the respective holes so as to enable displacement of the blocking member (32) from the operating position to the position of release.

FIG. 2

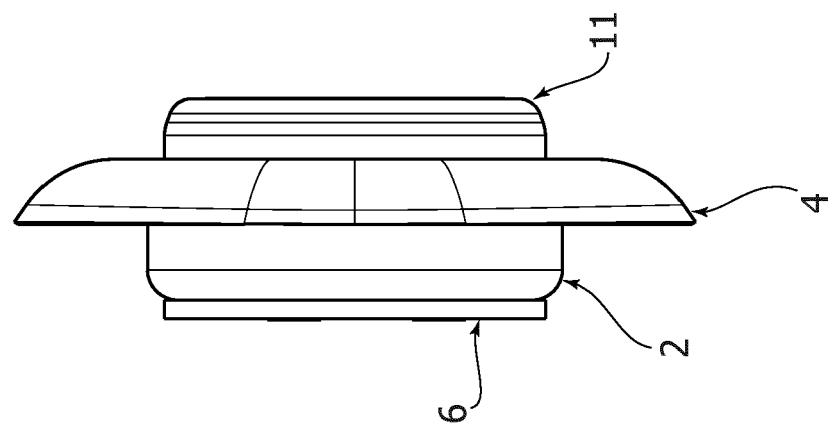


FIG. 1

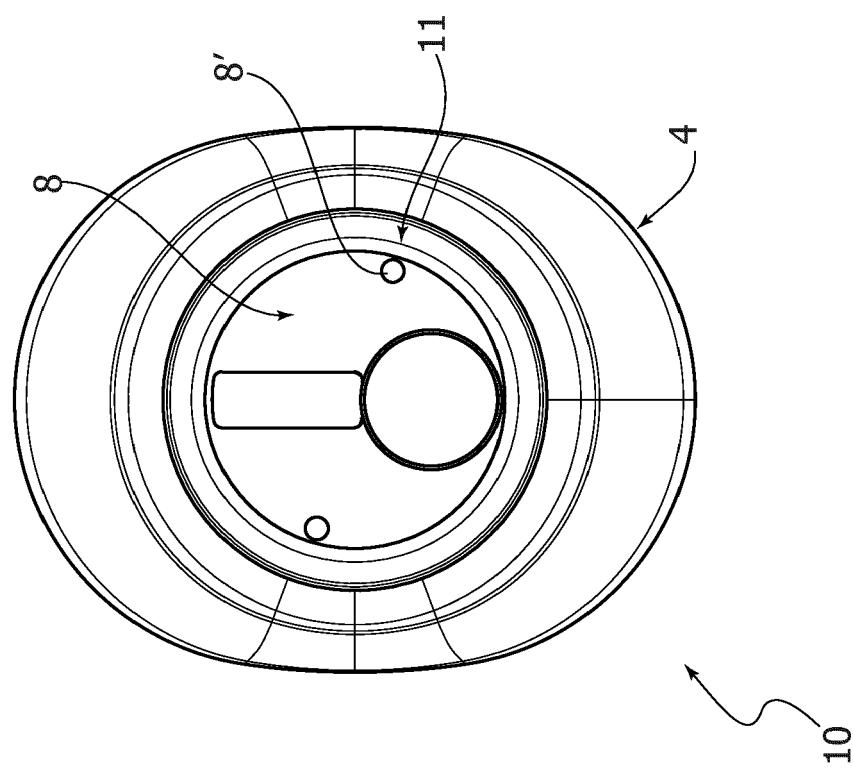


FIG. 3

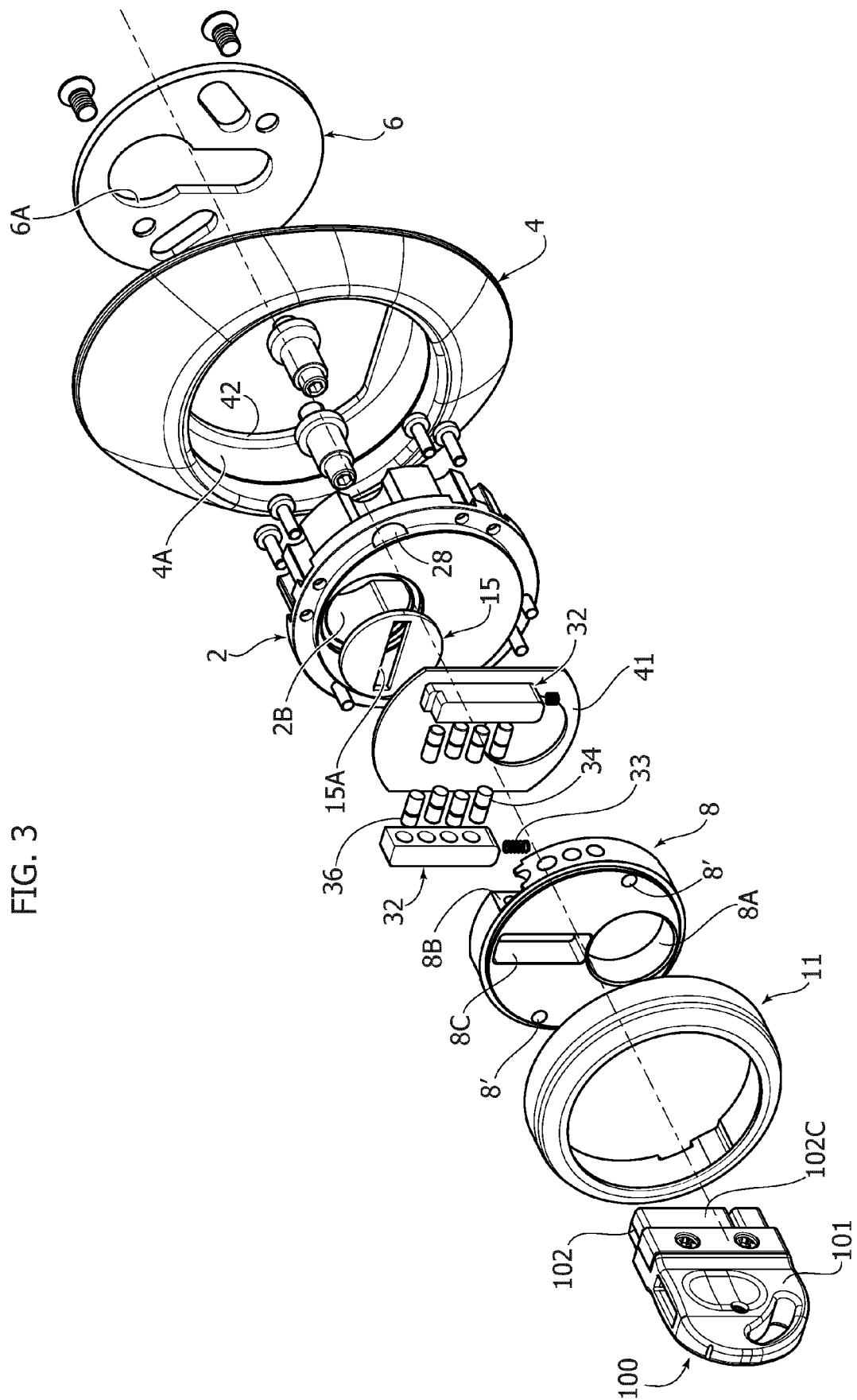


FIG. 4

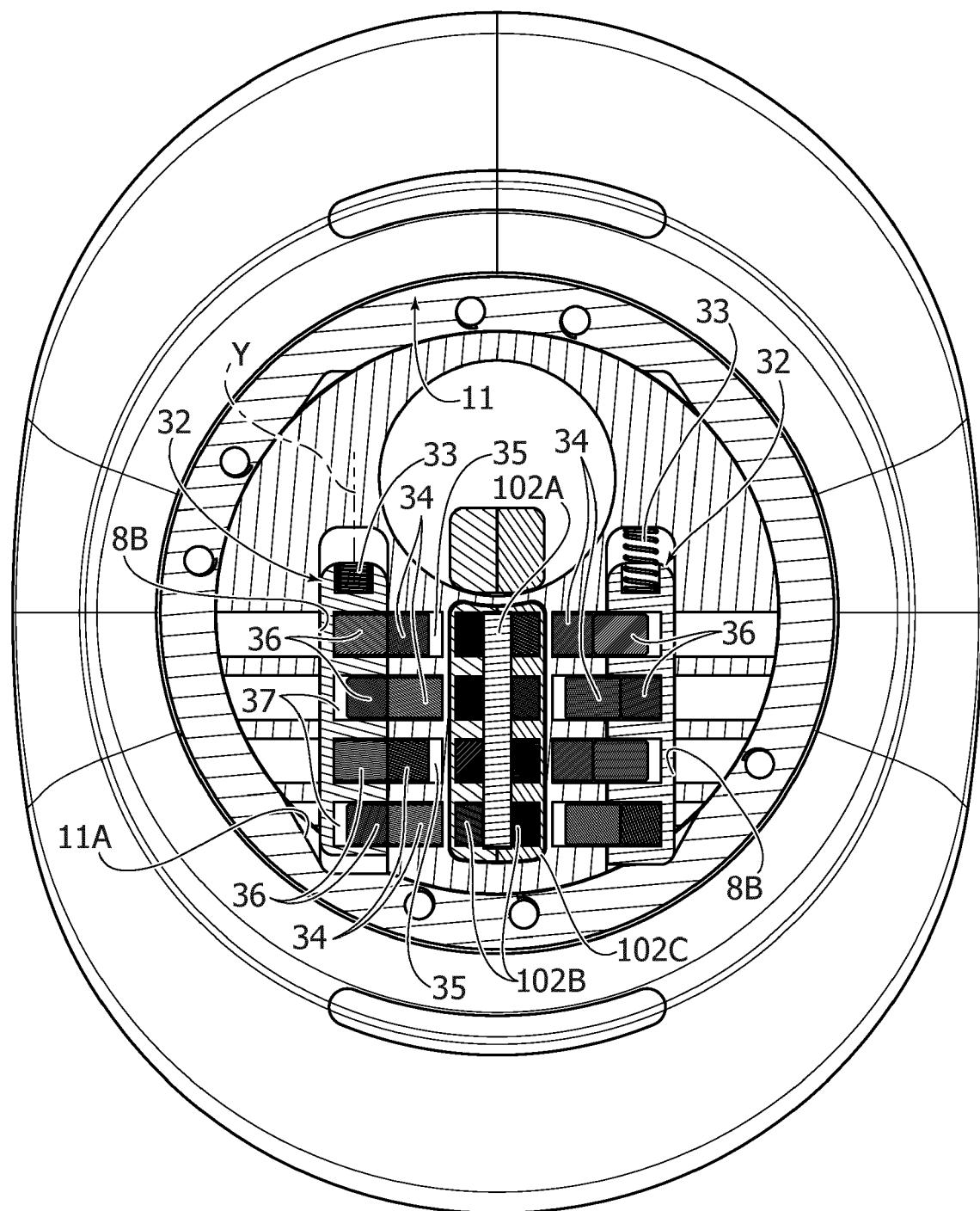


FIG. 5

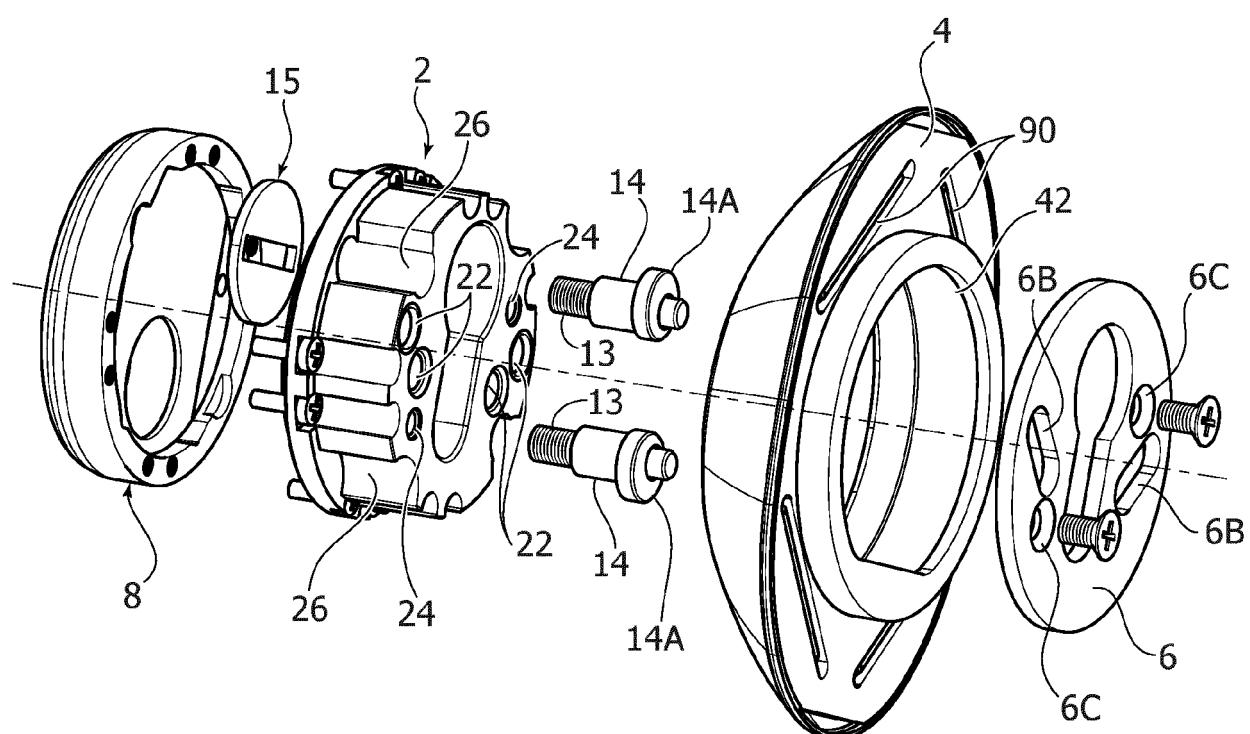


FIG. 6

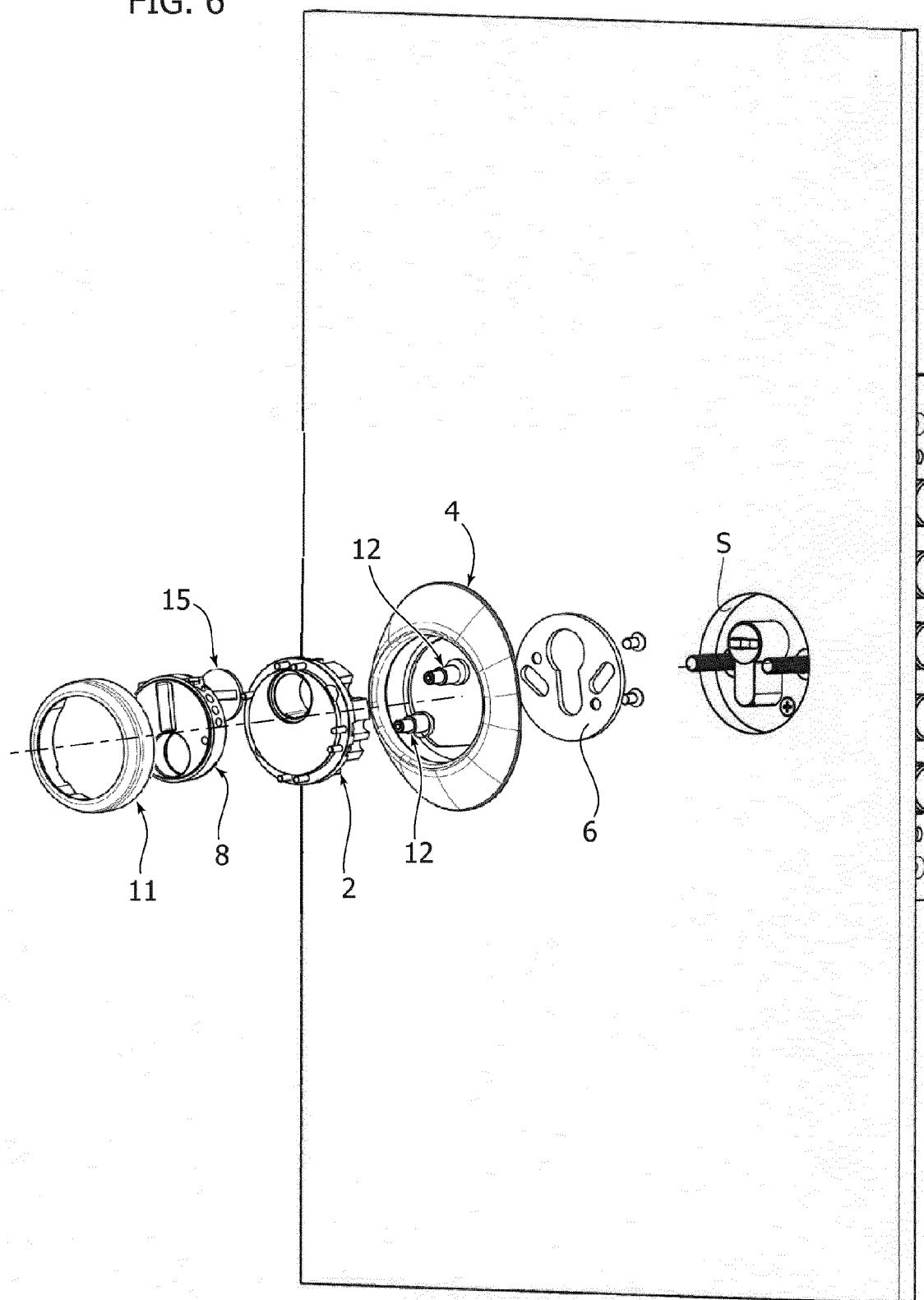


FIG. 7A

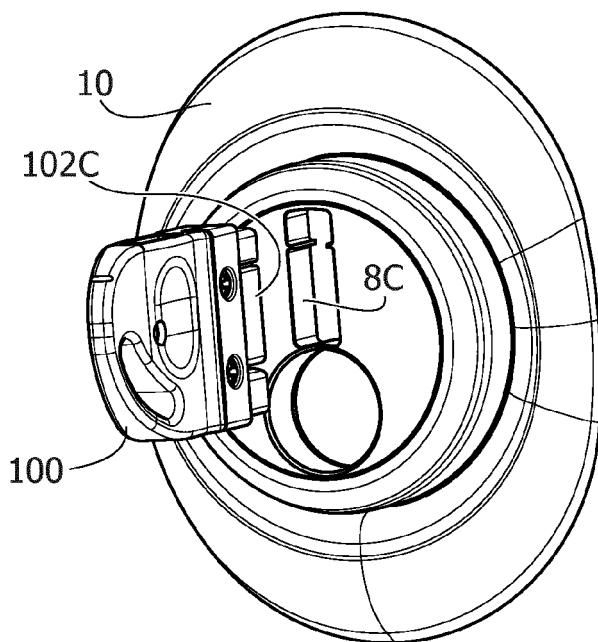


FIG. 7B

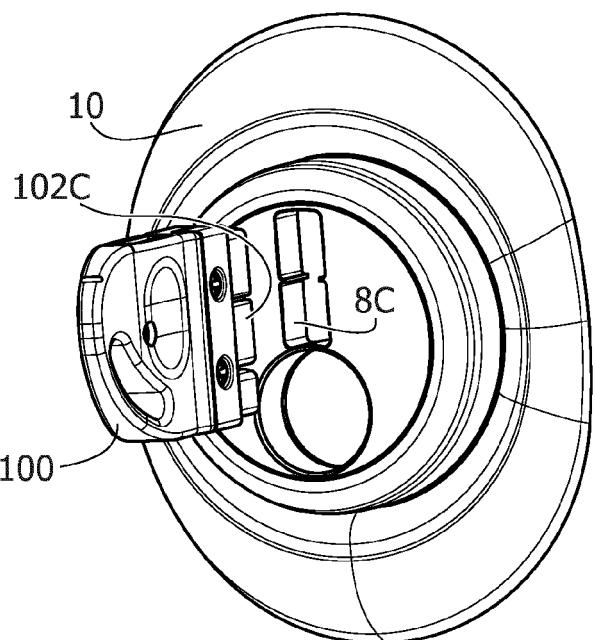
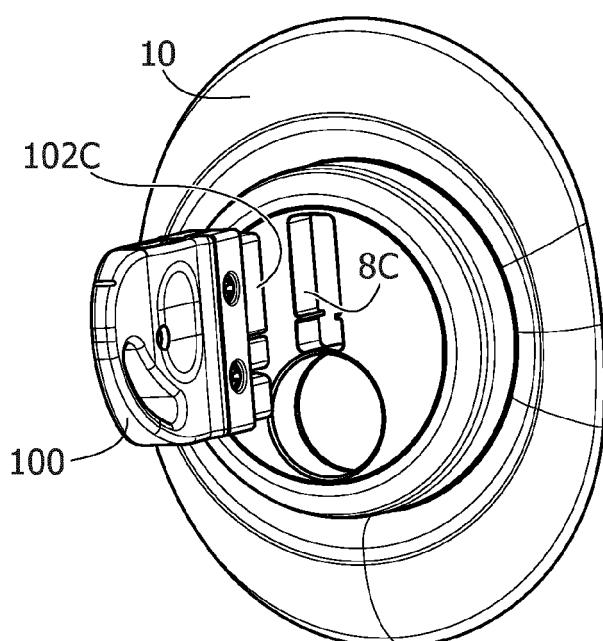


FIG. 7C





EUROPEAN SEARCH REPORT

Application Number

EP 21 20 6542

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50	<p>4 The present search report has been drawn up for all claims</p>		
	Place of search	Date of completion of the search	Examiner
	The Hague	31 March 2022	Koster, Michael
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	<p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>		
55	EPO FORM 1509 03/82 (P04C01)		

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