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(54) **Cabinet door for electrical panel cabinet**

(57) The invention regards a cabinet door for electrical panel cabinets comprising a plane (2) able to be hinged in order to be movable between a closing position in which it closes the cabinet, and an open position in which it opens the cabinet, said plane (2) being formed in such a manner that it has, on its external side, a projecting portion (3) that contains a shaped recess (4) formed to receive at least partially an activation lever (10) for opening/closing the door, said recess (4) comprising first fastening means (5) configured to cooperate with corresponding second fastening means (11) provided on the activation lever (10) so that the plane (2) can be operated in opening/closing position, where said first fastening means (5) and said projecting portion (3) presenting said recess (4), are integrally formed with the door (1).

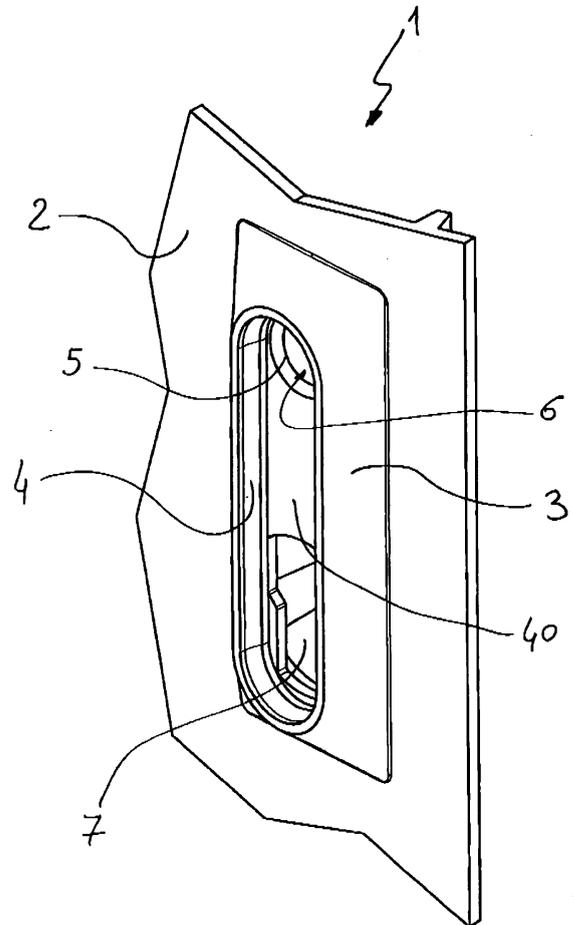


FIG. 2

Description

Field of application

[0001] The present invention refers to a cabinet door for electrical panel cabinets.

[0002] More in particular, the present invention refers to a cabinet fixed onto which is a lock of the handle type to allow closing/opening the cabinet door for an electrical panel cabinet.

Prior art

[0003] Known in the electrical panel cabinets industry are handle locks made of thermoplastic material that are fixed onto the cabinet door.

[0004] These handle locks of the prior art comprise a fixed part and a moveable part consisting of the lever that controls the opening and closing of the cabinet door itself.

[0005] In the prior art the locks are fixed onto the cabinet door by providing two specific holes to be made in the cabinet door into which two fixing screws are inserted that attach the fixed part onto the cabinet door.

[0006] A lock comprising a lever and the respective accommodation to be fixed onto the cabinet door is described in US 7,454,933. In this case, the accommodation corresponds to the fixed part which is screwed onto the cabinet door.

[0007] One of the problems that handle locks known from prior art may be subject to, is the loosening of the fastening between the fixed part of the lock and the cabinet door, with the ensuing jeopardizing of the operation of the system for closing the cabinet door.

[0008] In other words, should the fastening between the fixed part of the closing means and the cabinet door loosen, the entire lock could detach from the cabinet door, thereby reducing the functional characteristics of the electrical cabinet to the point of limiting the operation in the closing system.

[0009] In addition, it should also be borne in mind that should one want to replace the lock, it will often be necessary to entirely replace both parts, i.e. both the accommodation, i.e. the fixed part (which is screwed onto the cabinet door), and the lever, i.e. the moveable part (which allows opening/closing), with increased replacement costs as a result.

[0010] Another drawback deriving from the use of the handle locks of the prior art lies in the fact that, especially due to the fixed part of the lock, a protrusion is formed on the cabinet door that is poorly integrated with the entire structure of the cabinet, thus compromising the aesthetic aspects of the entire cabinet.

[0011] As a result there is a strongly felt need for a cabinet door for electrical panel cabinets with a construction that allows for an easy mounting of the closing/opening lever and that is at the same time simple and inexpensive to make, avoiding the need to use locks with two parts according to the prior art, in a simple and rational

construction solution.

[0012] The object of the present invention is meeting the abovementioned need and simultaneously overcoming the drawbacks mentioned above in relation to the prior art.

Summary of the invention

[0013] This object is obtained by means of a cabinet door for electrical panel cabinets according to claim 1.

[0014] The dependent claims outline preferred and particularly advantageous embodiments of the cabinet door according to the invention.

[0015] Further characteristics and advantages of the invention shall become clear from the following description, provided by way of non-limiting example, with reference to the figures illustrated in the attached drawings, wherein:

Brief description of the drawings

[0016]

- figures 1 and 2 show a perspective view of the front of a portion of a cabinet door, respectively with and without the presence of an activation lever, according to the present invention;
- figures 3 and 4 show a plan view of the front of a portion of a cabinet door, respectively with and without the presence of an activation lever, according to the present invention;
- figures 5 and 6 show a rear view of figures 1 and 2 respectively.

Detailed description

[0017] Referring to the abovementioned figures, 1 generally and schematically indicates a portion of a cabinet door for electrical panel cabinets according to the present invention.

[0018] Such a cabinet door 1 comprises a plane 2 suitable to be hinged in order to be moveable between a closing position, in which it closes the cabinet, and an opening position, in which it opens the cabinet. According to the present invention, the plane 2 is configured in such a manner that it has on the external side, i.e. on the side that is exposed when the cabinet door is closed, a projecting portion 3, which has a shaped recess 4, formed in such a manner as to at least partly receive an activation lever 10 for opening/closing the cabinet door 1. In addition, the shaped recess 4 comprises first closing means suitable to cooperate with corresponding second closing means obtained on the activation lever 10.

[0019] According to the present invention, these first closing means are obtained directly on the projecting portion 3, which together with the first closing means are integrally formed with the cabinet door 1, i.e. they are made as a single piece. This construction may be ob-

tained by means of fibreglass moulding or any other type of plastic, as well as in any other type of non-plastic material, such as for example aluminium or steel.

[0020] In the illustrated example such first closing means are formed by a bushing 5 obtained directly on the projecting portion 3, and the second closing means consist of a pin 11, barely visible in the figures, obtained on the activation lever 10.

[0021] The bushing 5, which is integral with the projecting portion 3, extends towards the interior of the cabinet door starting from the shaped recess 4, and it defines a first through aperture 6 with an axis that is perpendicular to the plane 2, in which the pin 11 is rotatably mounted.

[0022] Fixed at the free end of the pin 11, which projects from the inner side of the cabinet door 1, is at least one bar 12 for blocking/unblocking the cabinet door 1, to execute the blocking of the opening of the cabinet door, in the manner known in the field. Illustrated in the example is a single bar 12 that starts from a flange 13 (Fig. 5) keyed onto the pin 11 that is integral with the activation lever 10. This flange 13 has two small pins 14 fixed opposite each other, fixed onto which there are respectively a second and a third bar, not illustrated for the sake of simplicity.

[0023] With the aim of facilitating the closing of the cabinet door 1, the projecting portion 3, which - it should be borne in mind - is integral with the cabinet door itself, on which the activation lever 10 is mounted, is obtained in proximity to a lateral edge, usually on the side opposite to the one where the cabinet door is hinged onto the cabinet.

[0024] In the illustrated embodiment, the projecting portion 3 has a tapered configuration with a rectangular base and it has a maximum height starting from the plane 2 of the cabinet door 1 comprised between 1 and 4 cm. The shaped recess 4 is obtained on the top part of the projecting portion and has a depth lower than that of the height of the projecting portion 3, preferably equivalent to about 1/3.

[0025] In practice, the shaped recess 4 defines a seat 40 as may be observed in figures 2 and 4, in which the activation lever 10 is accommodated when it is in the closed position.

[0026] In order to allow the blocking of the activation lever 10 when the cabinet door 1 is in closing position, the shaped recess 4 is further provided with a second through aperture 7 suitable to accommodate first means for blocking the activation lever 10. These first blocking means cooperate with second blocking means obtained on the internal side of the plane 2 of the cabinet door 1, at the projecting portion 3.

[0027] Similarly to the first closing means, the second blocking means are preferably made integral with the cabinet door 1, i.e. they are constructed as a single piece.

[0028] In the illustrated example, the first blocking means obtained on the activation lever 10 comprise a latch 15 (Fig.5) controlled by a key, not illustrated, which is inserted into a keyhole 16 fixed onto the control lever

10, at the end opposite to the one with the pin 11. The keyhole 16 can, if necessary be concealed by a lid element 17 rotatably mounted on the activation lever 10 itself, so that the activation lever 10 is protected against possible acts of vandalism. This latch 15, controlled to be rotated by the user's key, cooperates with the second blocking means, which in the example are formed by a counter element 8 which serves as a shoulder against which the latch 15 ends up in abutment, when the activation lever 10 is in a blocking position.

[0029] In practice, in the position of blocking the activation lever 10, as is clearly observable in figure 5, the latch 15 blocks the activation lever 10 in the seat 40 obtained in the shape 4.

[0030] Therefore, in order to be able to actuate the lever 10 to open the cabinet door 1, it is necessary in the first place to unblock the latch 15 by disengaging it from the countering element 8 of the cabinet door 1. This is obtained by rotating the key fitted into the key hole 16, after lifting possible lid element 17.

[0031] In order to facilitate the disengagement of the latch 15 from the counter element 8, sliding means 9 (Figs 5, 6) are provided at the side of the counter element 8. In the illustrated example, the counter element 8 and the sliding means 9 are obtained integral with the cabinet door 1, being manufactured as a single piece with the cabinet door 1.

[0032] By disengaging the latch 15 from the counter element 8 of the cabinet door 1, the activation lever may be raised with respect to the shaped recess 4 in which it was accommodated, rotating with respect to the bushing 5, moving away from the plane 2 of the cabinet door 1. Through this first rotation, the blocking system formed by the latch 15 and by the keyhole 16 is extracted from the second aperture 7 of the cabinet door 1 freeing the activation lever 10. At this point, through a second rotation around the bushing 5, with respect to an axis substantially perpendicular to the plane 2, the bar 12 is disengaged, allowing the opening of the cabinet door 1 and access to the cabinet.

[0033] In order to isolate the blocking system formed by the latch 15 and keyhole 16 from the environment inside the cabinet, the use of a closing plug, not illustrated, is provided, to be screwed onto the internal side of the cabinet door 1 at the second opening 7, beside which are specifically provided two hollow pins 20, internally threaded or conceived to accommodate self-threading screws. This allows direct access to the cabinet from the second aperture 7.

[0034] As may be observed from the description, the cabinet door for electrical panel cabinets according to the present invention meets the needs and overcomes the drawbacks mentioned in the introduction of the present invention with reference to the prior art.

[0035] As a matter of fact, due to the presence of the projecting portion and the closing means made integral with the cabinet door, one no longer requires using closing systems made up of two parts, one of which is fixed

and one is moveable with respect to the cabinet door, as disclosed in the prior art, in that all that is required is to have the lever directly engage the closing means present on the projecting portion, to obtain a system for closing the cabinet door entirely equivalent to those obtainable using the system of the prior art, but without the drawback of first having to suitably fix the fixed part onto the cabinet door.

[0036] In this respect all the parts that in the prior art were part of the fixed part of the closing system, were directly transferred to the cabinet door, thereby considerably facilitating the operation of applying the handle.

[0037] Furthermore, providing the protrusion as integral with the cabinet door allows for cabinets with a higher aesthetic value, given that there are no parts (such as the fixed part of the locks of the prior art) of different colour, material, allowing for considerable personalization when configuring the protrusion right from the manufacture of the cabinet door.

[0038] Last but not least, there is the advantage of reducing the costs for replacing the closing system with respect to those of the system of the prior art.

[0039] Obviously, to meet contingent and specific requirements a person skilled in the art could apply various modifications and variants to the cabinet door described, all of which, however, would fall within the scope of protection of the invention as defined by the following claims.

Claims

1. Cabinet door for electrical panel cabinets comprising a plane (2) able to be hinged in order to be movable between a closing position in which it closes the cabinet, and an open position in which it opens the cabinet, said plane (2) being formed in such a manner that it has, on its external side, a projecting portion (3) that contains a shaped recess (4) formed to receive at least partially an activation lever (10) for opening/closing the door, said recess (4) comprising first fastening means (5) configured to cooperate with corresponding second fastening means (11) provided on the activation lever so that the plane can be operated in opening/closing position, **characterized in that** said first fastening means (5) are obtained directly on the projecting portion (3) and together with said projecting portion (3) presenting said recess (4), are integrally formed with the door (1).
2. Cabinet door according to claim 1, in which said door (1) together with the first fastening means (5) and the projecting portion (3) are made of a plastic material manufactured by injection moulding.
3. Cabinet door according to claim 1 or 2, in which said recess (4) has a first aperture (6) which is located in correspondence with said first fastening means (5) through which the activation lever (10) activates a bar (12) for locking/unlocking the door (1).
4. Cabinet door according to one of the preceding claims, in which said recess (4) has a second aperture (7) to accommodate the first blocking means (15) of the activation lever (10).
5. Cabinet door according to claim 4, in which on the internal side of said cabinet door (1) in correspondence with said projecting portion (3) second blocking means (8) are provided that are configured to cooperate with said first blocking means (15) of the lever when the latter are placed inside said second aperture (7).
6. Cabinet door according to claim 5, in which said second blocking means (8) are integrally formed with the door.
7. Cabinet door according to one of the preceding claims, in which said projecting portion (3) is provided in proximity to a lateral edge of said plane (2) of the cabinet door (1).
8. Cabinet door according to one of the preceding claims, in which said projecting portion (3) has a rectangle-based tapered configuration.
9. Cabinet for electrical use comprising a cabinet door (1) according to one of the previous claims.
10. Cabinet door structure for electrical panel cabinets with activation lever (10) for opening/ closing, comprising a movable plane (2) between a closing position in which it closes the cabinet, and an open position in which it opens the cabinet, said plane being formed in such a manner that it has a projecting portion (3) on its external side that contains a shaped recess (4) formed to receive at least partially said activation lever (10), said recess (4) comprising first fastening means (5) that cooperate with second corresponding fastening means (11) provided on the activation lever (10) so that the plane can be operated in opening/closing position, **characterized in that** said first fastening means (5) are obtained directly on the projecting portion (3) and together with said projecting portion (3) presenting said recess (4), are integrally formed with the movable plane (2).

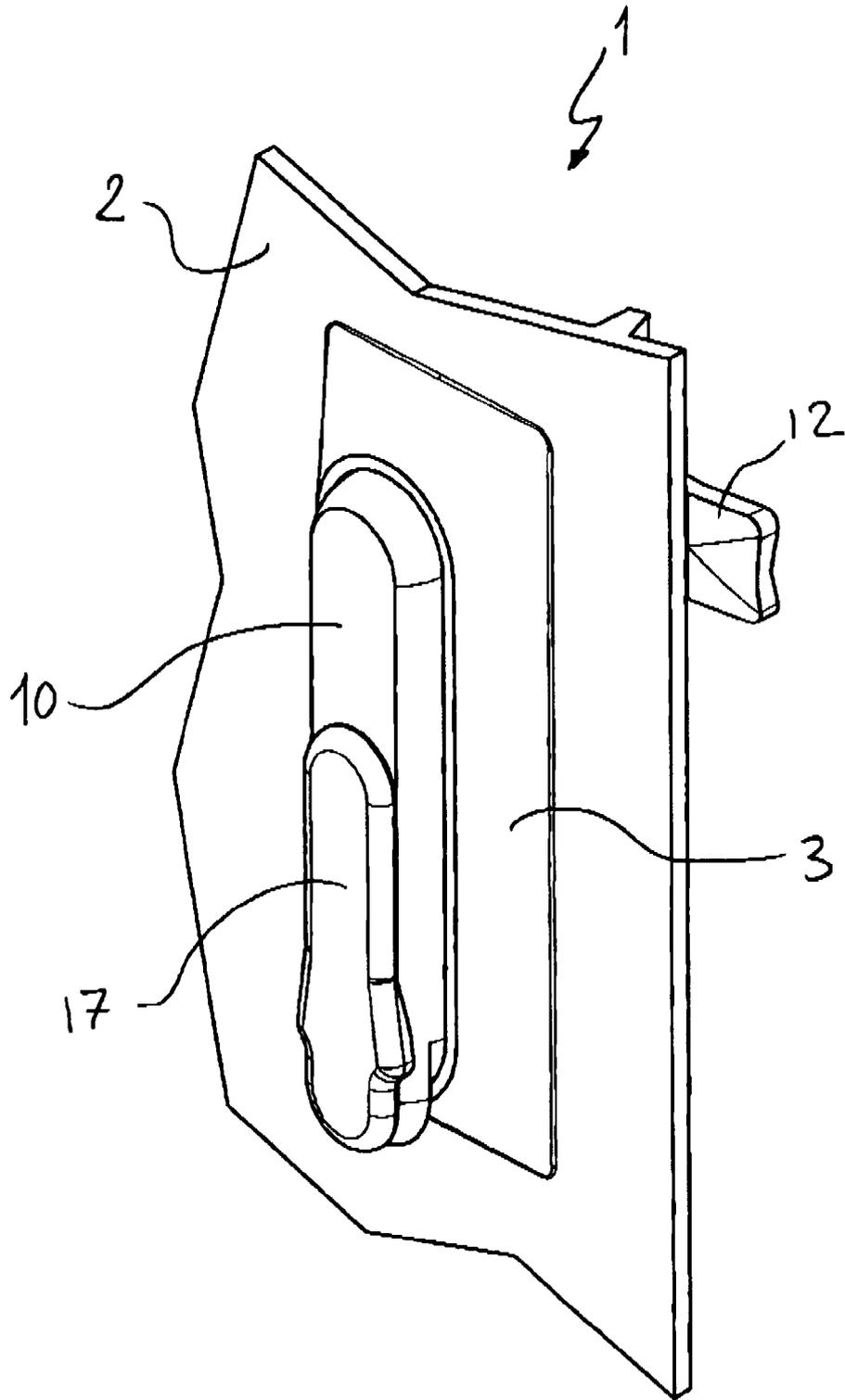


FIG. 1

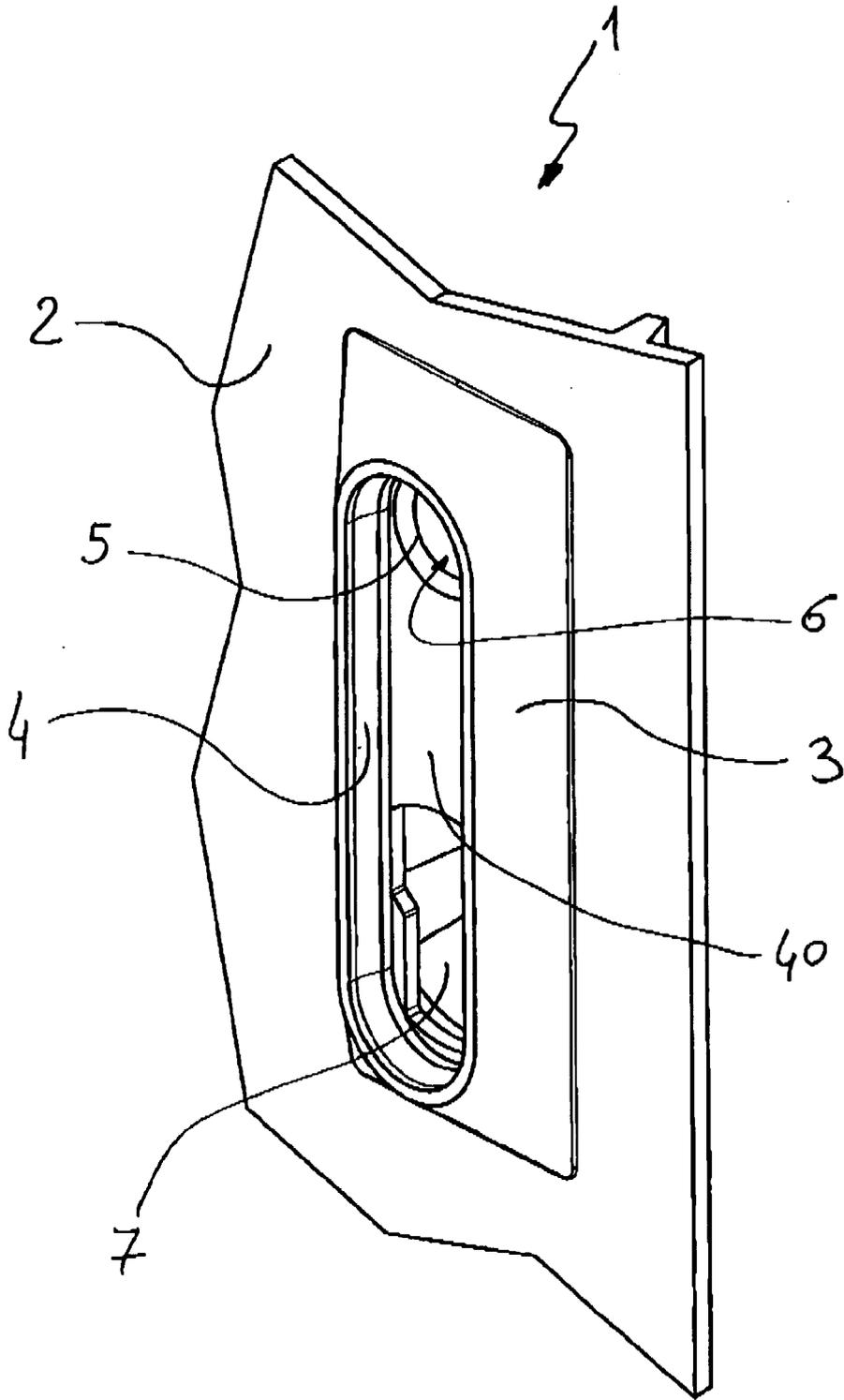


FIG. 2

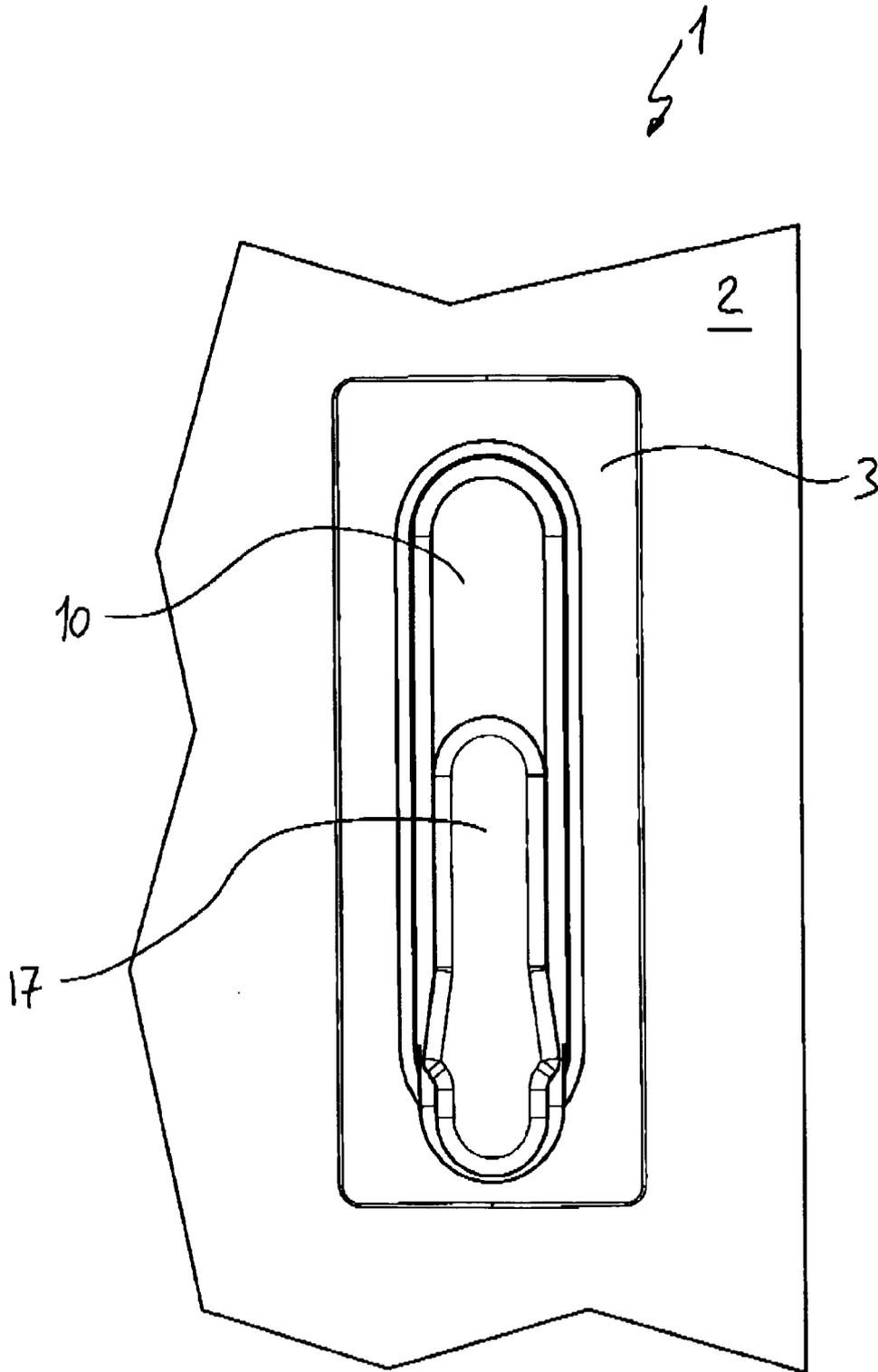


FIG. 3

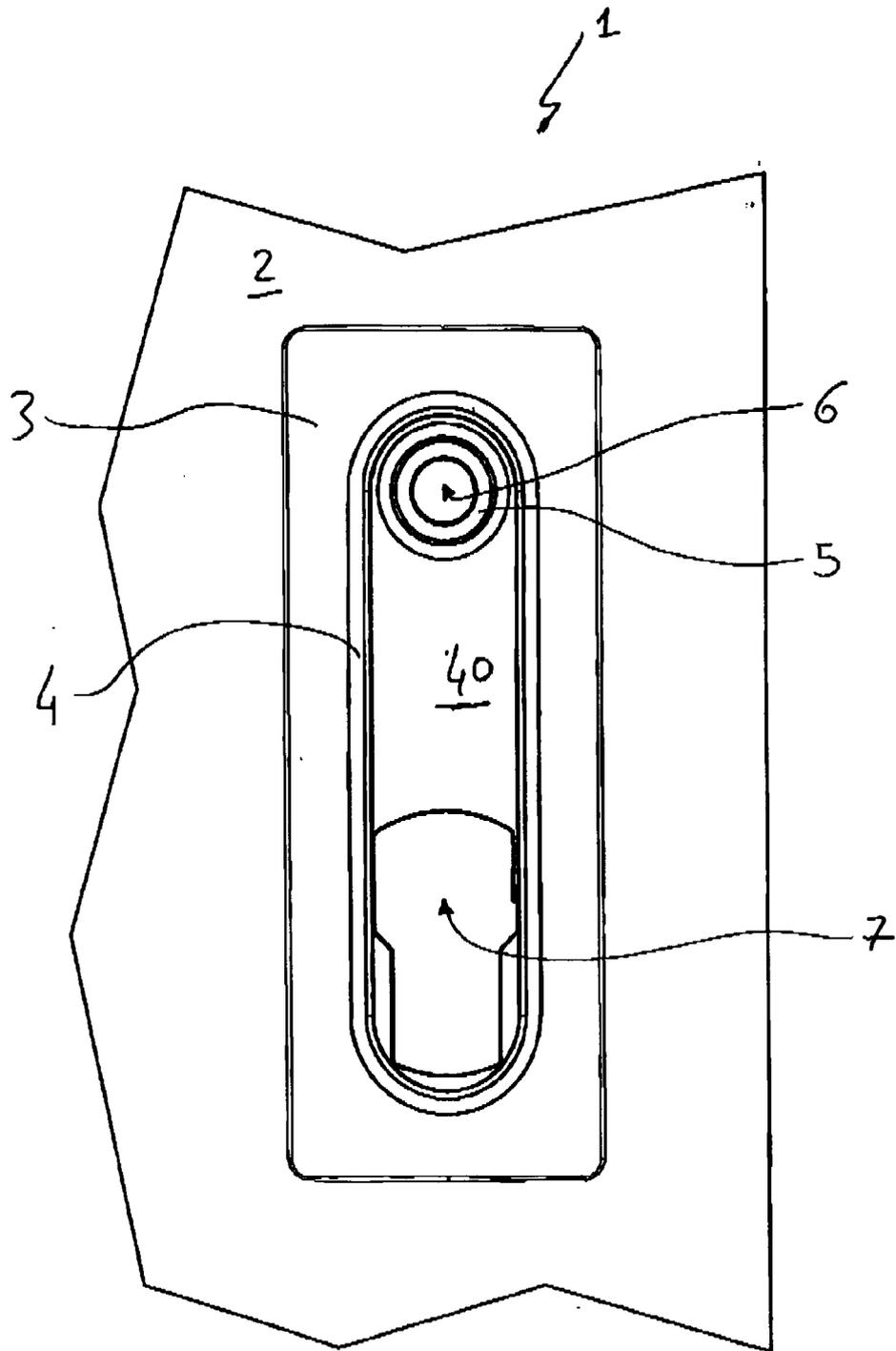


FIG. 4

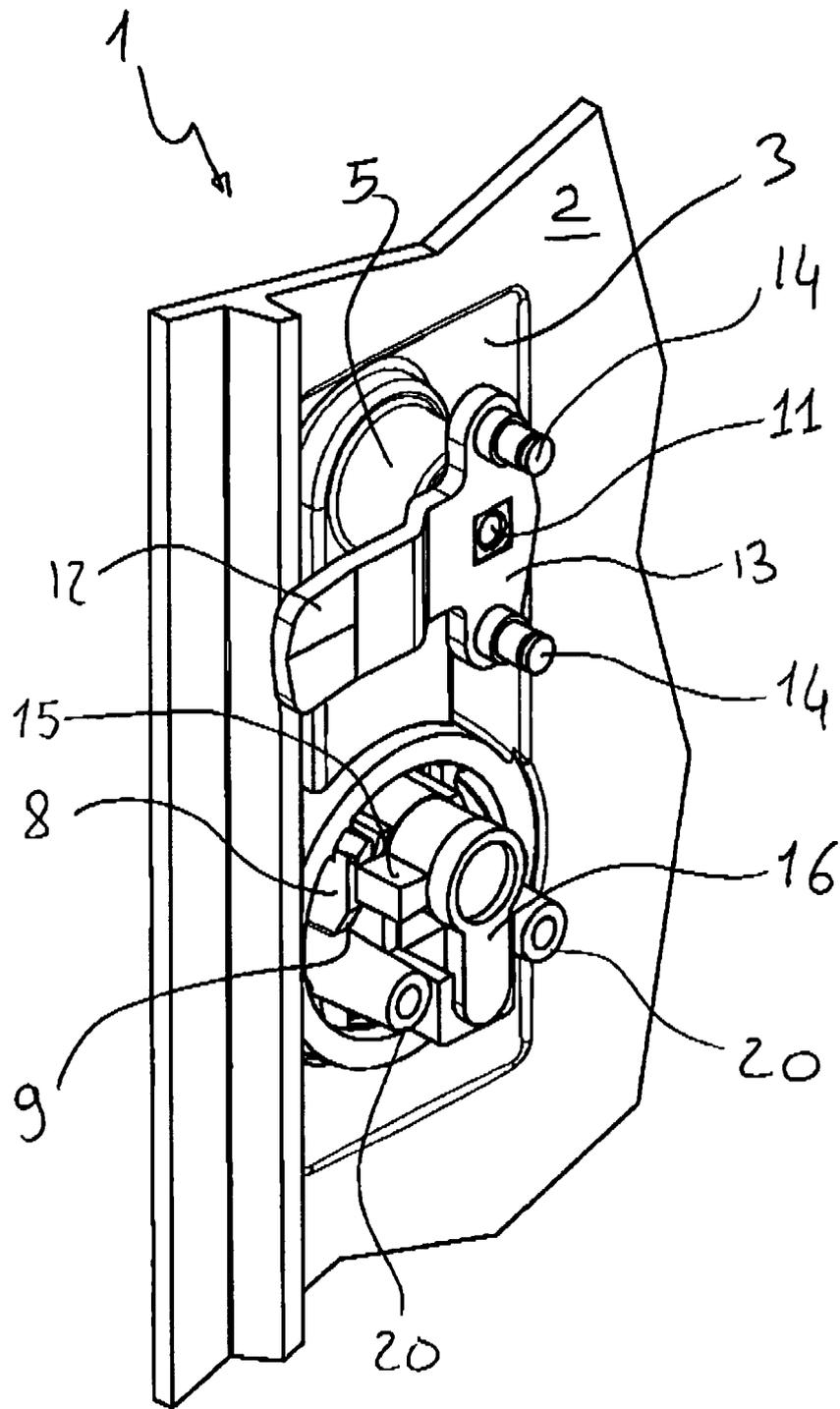


FIG. 5

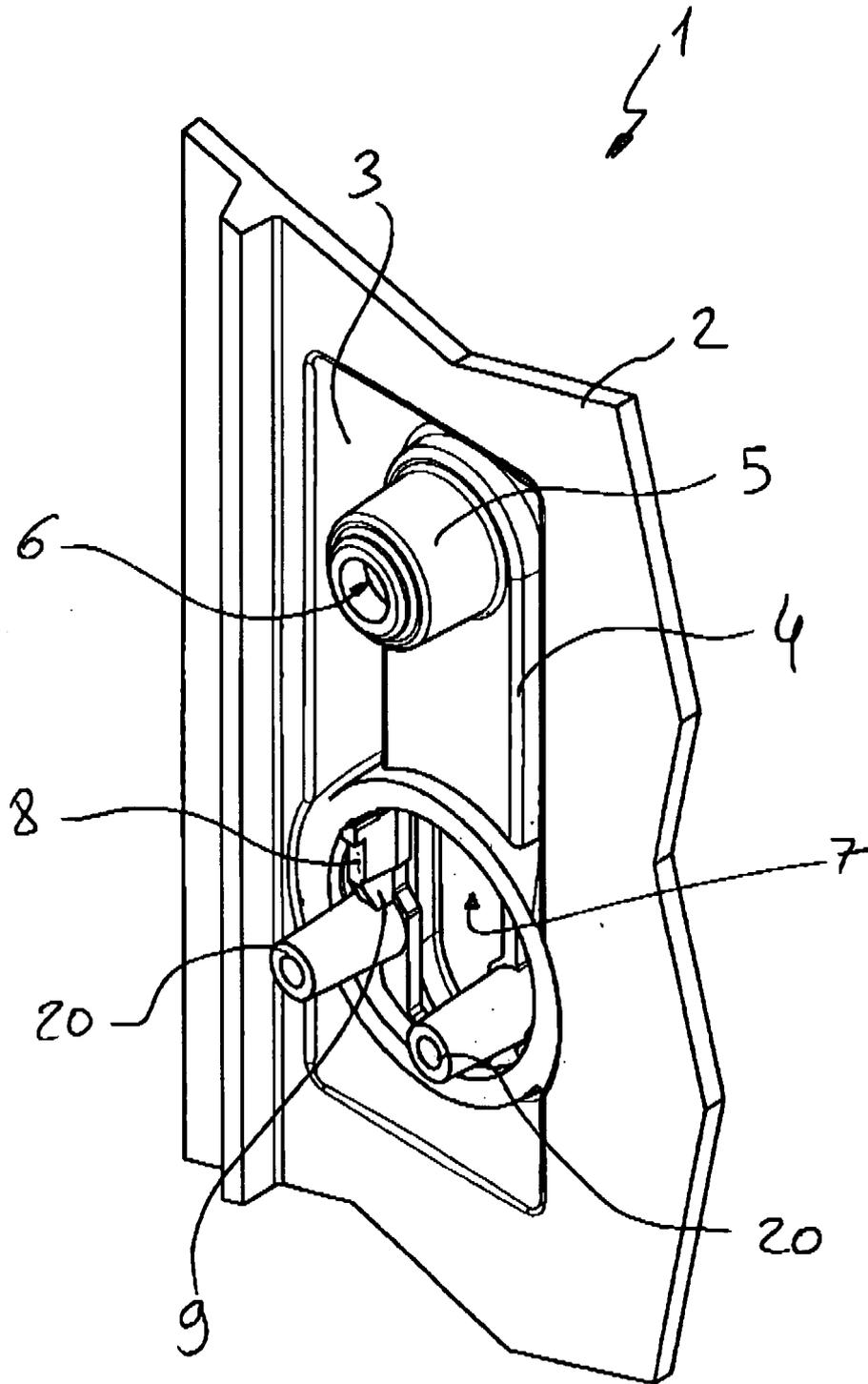


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
EP 10 00 3680

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Place of search Munich		Date of completion of the search 6 August 2010	Examiner Friedrich, Albert
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