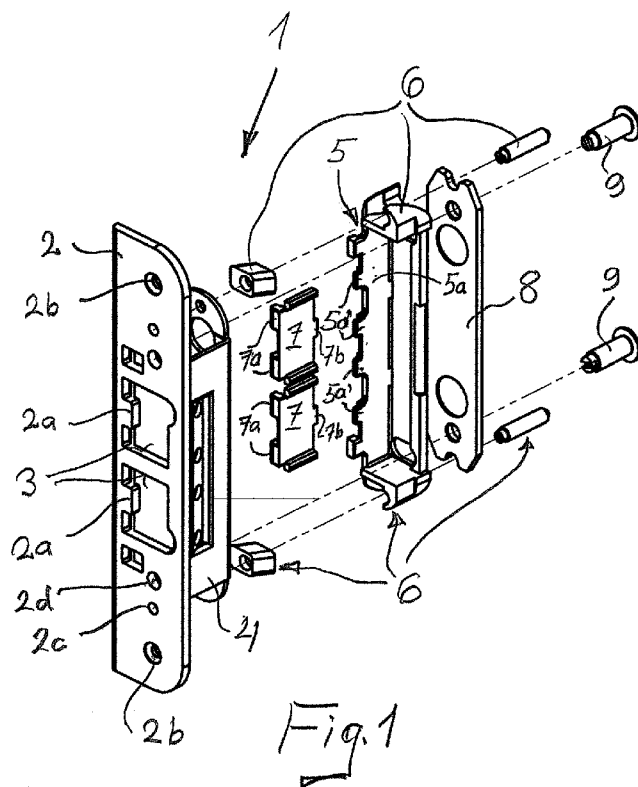




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(54) Title: COUNTERPLATE ARRANGEMENT



(57) Abstract: A counterplate arrangement (1) comprising of a plate element (2) with at least one bolt opening (3) for accommodating a lock bolt, and a casing element (5) located below the plate element that is moveable transversely in relation to the plate element (2) and that contains a tongue element (5a) that extends into the bolt opening (3) in the plate element in order to adjust the grip between the counterplate and the lock bolt. The tongue element (5a) is fitted with a separate control piece (7) installed on top of the tongue element (5a) that is arranged to control the lock bolt in relation to the bolt opening (3).



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COUNTERPLATE ARRANGEMENT

5 The object of the invention is a counterplate arrangement according to the preamble of Claim 1, comprising of a plate element with at least one bolt opening for accommodating a lock bolt, and a casing element located below the plate element that is moveable transversely in relation to the plate element and that contains a tongue element that extends into the bolt opening in the plate element in order to adjust the grip between the counterplate and the lock bolt.

10

Counterplate arrangements in which the grip between the bolt opening in the counterplate and the lock bolt that interoperates with the counterplate can be adjusted are known from prior art. In practice, the lock bolt and the parts of the counterplate that are in contact with the lock bolt are made of metal because of
15 fire safety reasons and in order to achieve better breaking strength. Due to this, interoperation of the bolt and the counterplate involves friction and may cause a noise problem. Long-term intensive use is also likely to cause wear and tear on the parts.

20 The purpose of the invention is to provide an improved counterplate arrangement that will minimise the problems of prior art.

The objectives will mostly be achieved in the way presented in more detail in Claim 1 and the other claims. According to the invention, the tongue element is
25 fitted with a separate control piece installed on top of the tongue element that is arranged to control the lock bolt in relation to the bolt opening. This arrangement provides freedom of choice with regard to the control piece, making it possible to select the most appropriate alternative for achieving the objectives of the invention.

30

The control piece is preferably shaped and installed so that it serves as the sole or almost sole mating surface for the lock bolt when the bolt is inserted into the

bolt opening. Furthermore, the control piece is preferably made of a material different from said tongue element, most preferably plastic. Thus a suitable choice of material for the control piece can reduce the noise problem caused by the interoperation of the bolt and the counterplate arrangement. The friction
5 between the mating surfaces of the bolt and the counterplate arrangement can also be preferably reduced, which will also affect the durability of the functional parts.

10 In a preferred practical solution, the tongue element is a part of the planar side section of the casing element, which is mainly perpendicular to the plane of the counterplate's plate element, and comprises at least one connecting projection on which the control piece is arranged to be supported.

15 The plate element may have a projection parallel to its planar direction, as such known from prior art, that extends from roughly the middle of the bolt opening's edge towards the centre of the bolt opening. In this case the tongue element preferably comprises connecting projections located on both sides of said plate element projection. In this case the control piece is arranged to be supported by both connecting projections.

20 When installed, the control piece also extends to the plane of the outer surface of the plate element. This means that the bolt can partially slide on the surface of the control piece before it extends into the bolt opening.

25 In the following, the invention will be described by way of example through reference to the enclosed schematical drawings, in which

- Figure 1 illustrates an exploded view of a counterplate arrangement according to the invention,
- Figure 2 illustrates the counterplate arrangement of Figure 1 when assembled,
- 30 - Figure 3 illustrates the counterplate arrangement of Figure 2 viewed from the front,

- Figure 4 illustrates the counterplate arrangement of Figure 3 viewed from direction IV – IV,
- Figure 5 illustrates a sectional view of the counterplate arrangement of Figure 3 at position V – V after adjustment,
- 5 - Figure 6 illustrates section VI – VI of the counterplate arrangement of Figure 3,
- Figure 7 illustrates section VII – VII of the counterplate arrangement of Figure 3.

10 In the drawings, reference number 1 generally refers to a counterplate arrangement that comprises a planar plate element 2 with openings 2b for fastening the counterplate arrangement in a door frame or similar using screws. In this case, the plate element 2 comprises two bolt openings 3 both having plate element projections 2a directed towards the middle of the bolt openings 3, controlling the movement of the lock bolt in interoperation with the counterplate

15 into the bolt opening 3. Furthermore, a casing 4 is immovably supported on the plate element 2, and when the counterplate arrangement is assembled, said casing contains a separate casing element 5 that is movably supported on the plate element 2 and that can be fixed in its chosen position using a mounting plate 8 and mounting screws 9 that are supported on the plate element 2 and

20 screwed through openings 2d in the plate element.

The casing element 5 includes a tongue element 5a that extends to the plate element's bolt openings 3. The casing element 5 and thus the tongue element 5a are adjusted in relation to the bolt openings 3 using adjustment means 6

25 known from prior art, which are arranged in both ends of the counterplate arrangement and whose operation is particularly evident from Figures 4 and 5. An adjustment screw belonging to the adjustment means is supported by threads on an adjustment element having inclined adjustment surfaces that interoperate with correspondingly inclined mating surfaces in the casing

30 element 5. Thus, turning the adjustment screw through the plate element opening 2c moves the adjustment element vertically in the figures, which, due to

the inclined mating surfaces, makes the casing element 5 move in the planar direction of the plate element 2 as is evident from Figures 4 and 5.

5 The tongue element 5a comprises connecting projections 5a' on which there is supported and installed a separate control piece 7 having mating parts 7a that fit into the connecting projections 5a', completely covering them and extending to the outer surface of the plate element 2. The control piece 7 is mostly planar and, at its end opposite to the plate element 2 and its bolt opening 3, extends to the lower part of the casing element 5, which has a groove into which a small
10 projection 7b in the control piece 7 is pressed. Thus moving the casing element 5 in a transverse direction in relation to the plate element 2 will always cause movement of the control piece 7, and this feature can be utilised for adjusting the mutual grip between the bolt opening 3 and the bolt, as well as the clearance of the bolt in the bolt opening 3.

15

Each bolt opening has its own control piece 7 whose mating parts 7a settle on both sides of the plate element projections 2a. Thus the movement of the bolt along the surface of the counterplate's plate element 2 towards the bolt opening 3 is controlled throughout its entire travel, first by the projection 2a and then by
20 the mating parts 7a of the control piece. When the control piece 7 is made of suitable material, such as a plastic or similar, the bolt can operate with less friction and more smoothness, which is likely to reduce operating noise and improve the durability of the structures.

25 The invention can be applied regardless of the number of bolt openings in the counterplate arrangement.

The invention is not limited to the presented embodiments but several variations can be conceived within the scope of the associated claims.

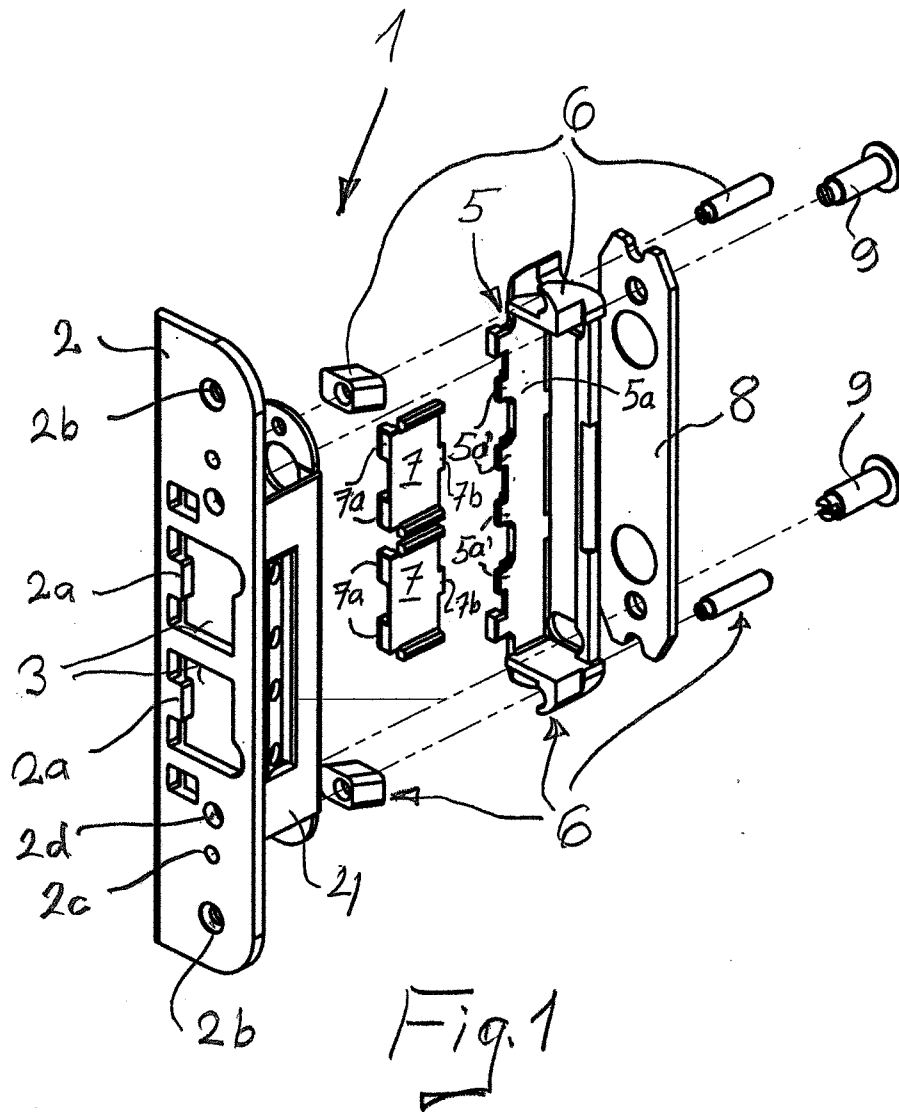
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PATENT CLAIMS

1. A counterplate arrangement (1) comprising of a plate element (2) with at least one bolt opening (3) for accommodating a lock bolt, and a casing
5 element (5) located below the plate element that is moveable transversely in relation to the plate element (2) and that contains a tongue element (5a) that extends into the bolt opening (3) in the plate element in order to adjust the grip between the counterplate and the lock bolt, **characterised** in that said tongue element (5a) is fitted with a separate control piece (7) installed on top
10 of the tongue element that is arranged to control the lock bolt in relation to the bolt opening (3).
2. A counterplate arrangement according to Claim 1, **characterised** in that the control piece (7) is shaped and installed so that it serves as the sole or
15 almost sole mating surface for the lock bolt when the bolt is inserted into the bolt opening (3).
3. A counterplate arrangement according to Claim 1 or 2, **characterised** in that said control element (7) is of a material different from said tongue element
20 (5a), most preferably plastic.
4. A counterplate arrangement according to any of the preceding claims, **characterised** in that the tongue element (5a) is a part of the planar side
25 section of the casing element (5), which is mainly perpendicular to the plane of the counterplate's plate element (2), and comprises at least one connecting projection (5a') on which the control piece (7) is arranged to be supported.
5. A counterplate arrangement according to Claim 4, **characterised** in that the
30 plate element (2) has a projection (2a) parallel to its planar direction that extends from roughly the middle of the bolt opening's (3) edge towards the centre of the bolt opening (3), the tongue element (5a) comprising

connecting projections (5a') located on both sides of said plate element projection (2a), and the control piece (7) being arranged to be supported by both connecting projections (5a').

- 5 6. A counterplate arrangement according to any of the preceding claims, **characterised** in that when installed, the control piece (7) extends to the plane of the outer surface of the plate element (2).



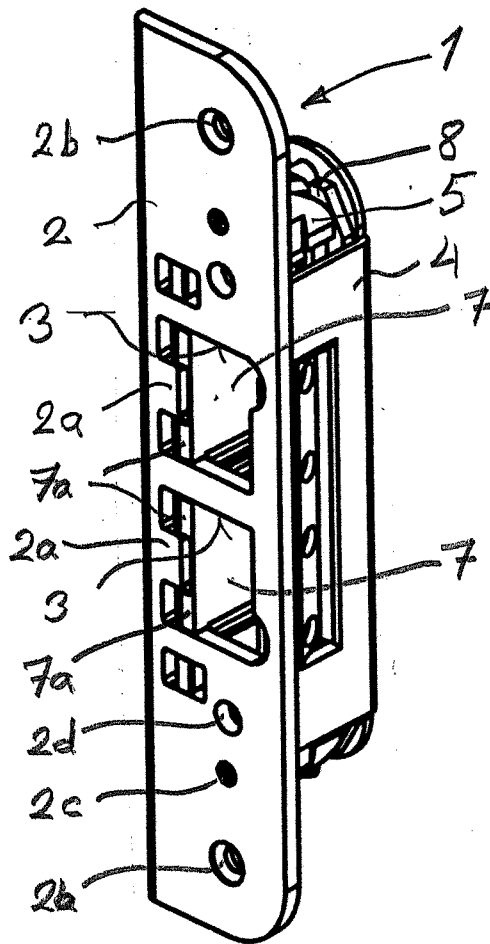


Fig. 2

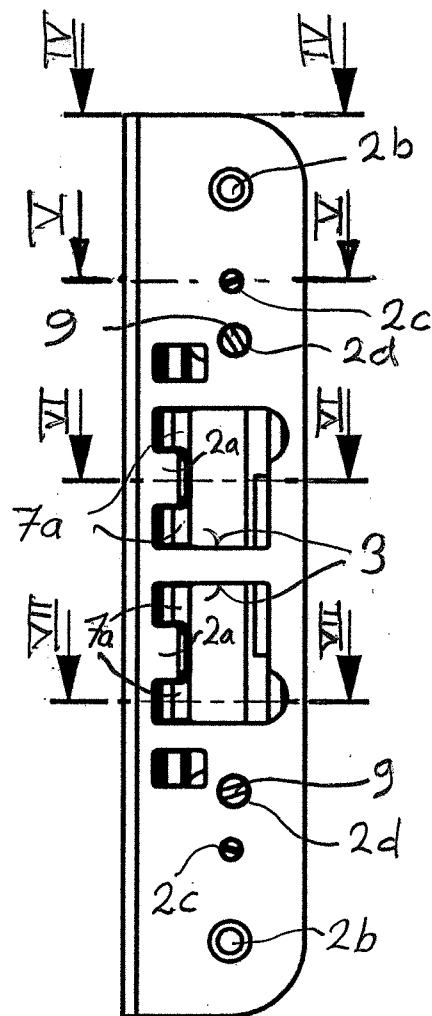


Fig. 3

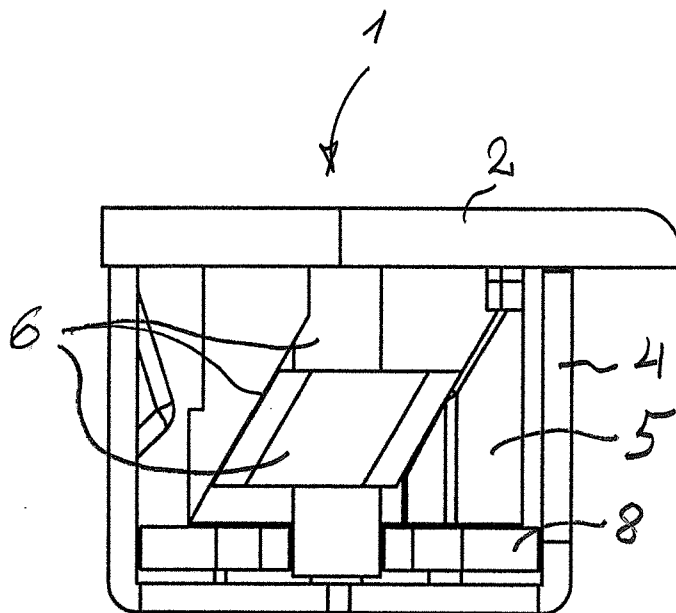


Fig. 4

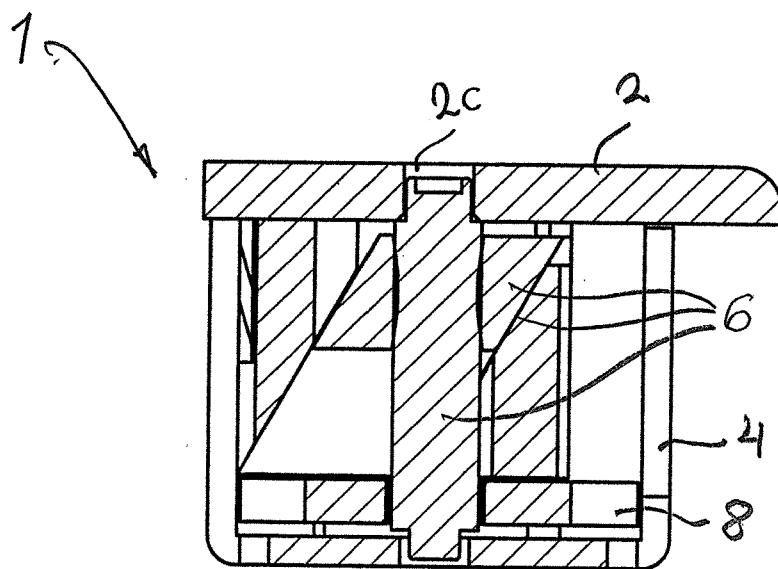


Fig. 5

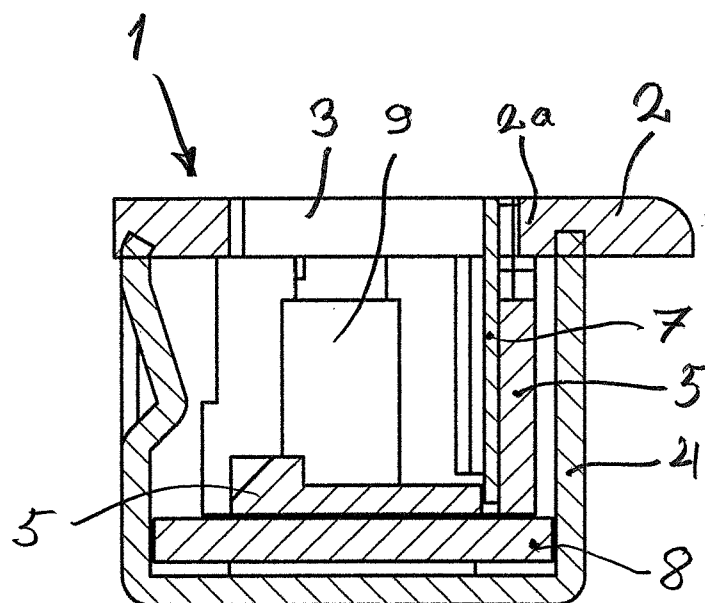


Fig. 6

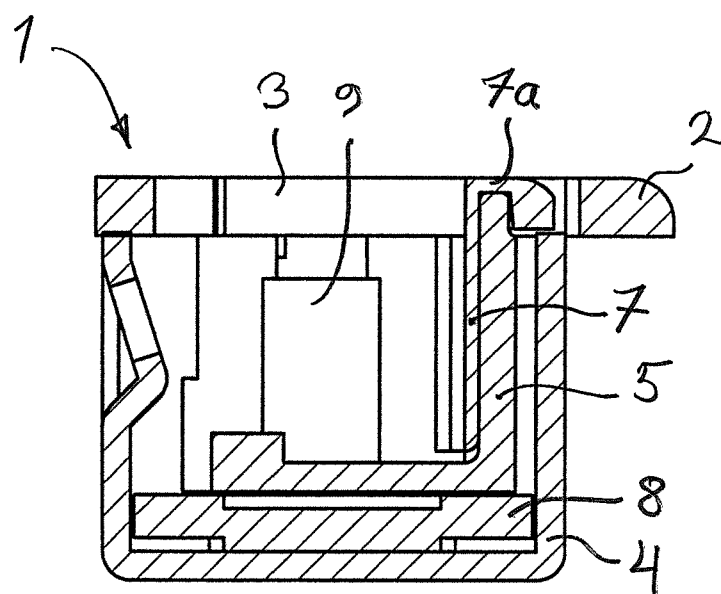


Fig. 7