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(54) Adjustable striker plate

(57) The invention relates to an adjustable striker plate arrangement for a door, which comprises a striker plate (1) and a bolt opening (2) arranged to its front surface and a bolt casing piece (3) displaceable with respect to the striker plate. The striker plate (1) comprises guiding means (4, 4.1, 4.2) arranged as an integral part of the bolt casing piece (3), and the bolt casing piece (3) comprises at least one guiding opening (8, 8.1, 8.2, 8.3) for the guiding means (4, 4.1, 4.2). According to the arrangement, the guiding means (4, 4.1, 4.2) and the guiding opening (8, 8.1, 8.2, 8.3) together determine the relative position of the bolt casing piece (3) and the striker plate (1).

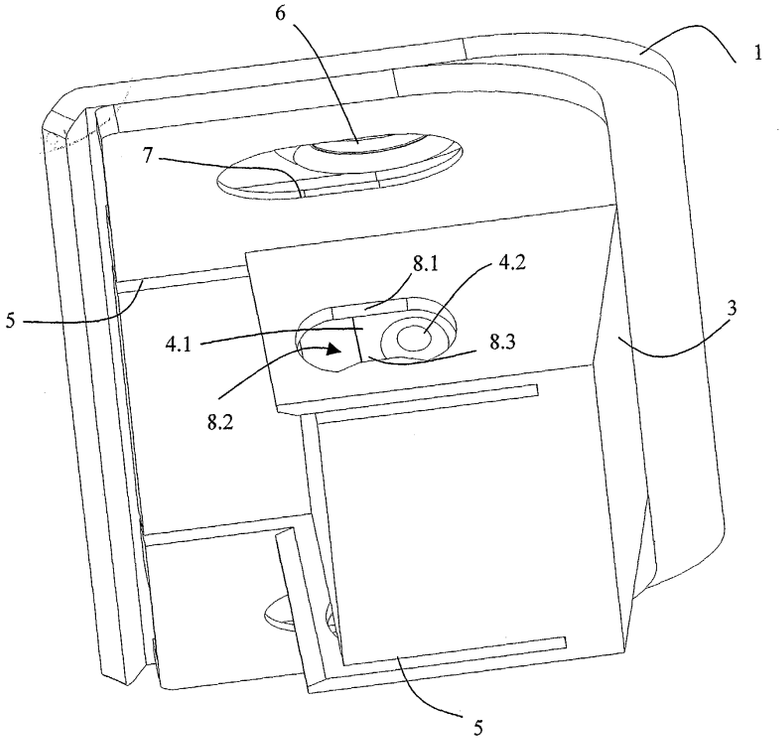

Fig. 3

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Description

[0001] The invention relates to an adjustable striker plate arrangement according to the preamble of claim 1.

[0002] Striker plates are generally used as counterparts for locks mounted on frames. When doors are closed, it is essential that there is not too much clearance between the door and the frame, which would allow the door to move due to currents of air and pressure fluctuations. Typically, the frames are made of wood and since the form and size thereof vary somewhat according to the circumstances and in the course of time, there is a need to adjust the locking of the door. This is typically done by adjusting the striker plate. Among other things, it is known to provide the striker plate with a bendable tongue, the position of which determines the tightness of the door when locked.

[0003] At certain locations doors may be provided with a seal to be arranged between the door and the frame, which causes a force urging the bolt in the opening direction of the door when the door is locked. When the door is closed, it has to be pressed against the seal so that the seal is compressed to such an extent that the bolt is at the position of the bolt opening of the striker plate and may protrude into the bolt opening. A certain sealing force is therefore needed. Generally, in the locking field, "sealing force" means the force needed in conjunction with the closing of a door or the like to press the door against the seal so that the lock bolt may properly penetrate through the bolt opening into the bolt casing. In structures like this there are several reasons for adjusting this sealing force, for example the position of the door frame may change somewhat in the course of time or the seals may be changed to tighter ones.

[0004] One way to adjust the sealing force is described in publication FI 820120, which proposes arranging behind the striker plate a piece extending in the direction normal to its surface as well as screws transverse to its longitudinal direction. By turning the screws, the piece located against the bolt's side can be moved. One disadvantage with this arrangement is however that when the mounting has already been effected, it is very difficult to adjust the sealing force, because this has to be done through small holes by turning the screws behind the striker plate with a special tool. Furthermore, retention in place of the plate piece determining the sealing force depends on the force of the springs in conjunction with the adjusting screws, which increases the risk of malfunctions. Besides, due to the spring force, the adjustment requires a relatively large torsion force. A further drawback in a solution of this kind is that if the adjusting piece is displaced by a substantial distance, a step or even an intermediate space is formed between the striker plate surface and the edge of the adjusting part, into which the bolt may protrude somewhat. In this case the lock is not properly locked, even if it would seem so when somebody tries to open the door.

[0005] Especially in interior doors there is a need for a simple and operationally reliable adjustable striker plate, the use of which is sufficiently easy. Additionally, a particular characteristic of interior doors is that their durability against attempted burglaries is of minor importance.

[0006] An aim of the invention is to provide an adjustable striker plate arrangement, which minimizes the problems of the prior art. A special aim of the invention is to provide a striker plate arrangement meant for intermediate or interior doors, in which the adjustment of the sealing force is simple and, at the same time, the locking of the position of the pieces to be adjusted takes place reliably and efficiently.

[0007] The invention provides an adjustable striker plate arrangement according to claim 1. Preferred or optional features of the invention are defined in the other claims.

[0008] An adjustable striker plate arrangement according to the invention for a door comprises a striker plate with a bolt opening arranged in its front surface and a bolt casing piece displaceable with respect to the striker plate, the striker plate comprising guiding means arranged as an integral part of the bolt casing piece. The bolt casing piece further comprises at least one guiding opening for the guiding means, so that the guiding means and the said guiding opening together determine the relative position of the bolt casing piece and the striker plate. Advantageously, the said at least one guiding opening forms a closed circle defining an opening inside thereof.

[0009] The guiding means are arranged to extend behind the striker plate over a first distance from its back surface, and they essentially comprise both a first section parallel with a surface normal to the striker plate and a second section parallel to the plane of the surface. The said guiding opening of the bolt casing piece is arranged essentially at the first distance from the back surface of the striker plate to cooperate with the said second section.

[0010] The bolt casing piece has a free space for the guiding means, the dimensions of which space in the longitudinal direction of the bolt casing piece correspond to the dimensions of the guiding means in a corresponding direction, and which space is larger in the transverse direction of the striker plate than the dimension of the guiding means in a corresponding direction. The guiding means and the said guiding opening together allow movement of the bolt casing piece with respect to the striker plate essentially in the plane of the striker plate and in a transverse direction with respect to the longitudinal axis of the striker plate.

[0011] The guiding opening comprises two parallel surface sections essentially at a second distance from each other, one surface section of which further comprises at least one zone, in the area of which the surface sections are locally closer to each other than the second distance.

[0012] The first section parallel with the normal to the

striker plate guiding means is connected with the striker plate in the vicinity of the edge of the bolt opening of the striker plate at a first end of the first section, and the second section parallel with the level of the guiding means extends from the second end of the first section away from the bolt opening parallel with the striker plate level.

[0013] Advantageously, at least the first section is formed of the planar material of the striker plate by bending at least part of the striker plate material, remaining otherwise in the bolt opening area, behind it.

[0014] The bolt casing piece comprises a plane parallel with the striker plate, which has essentially the size of the striker plate in the longitudinal direction thereof and which is smaller than the striker plate in the transverse direction thereof and there is a bolt casing arranged on the said plane.

[0015] The striker plate according to the invention has openings on two sides of the bolt opening and the bolt casing piece extends beyond the openings and comprises openings at the position of openings of the striker plate. The openings of the bolt casing pieces are advantageously oblong in the transverse direction of the bolt casing piece. The bolt casing piece further comprises the bolt casing and slot-like spaces in a transverse direction of the bolt casing piece arranged on two sides thereof for the first sections of the guiding means. The slot-like spaces extend advantageously from one edge of the bolt casing piece to the area of the bolt casing. In addition, the second section of the guiding means may be formed as an extension of the first section from the same blank. Advantageously, the said second section and the guiding opening are in such an interaction with each other that the bolt casing piece and the striker plate are interlocked in a displaceable manner.

[0016] In the following the invention is described by way of example only with reference to the accompanying drawings, in which:

- Figure 1 shows schematically a striker plate arrangement according to the invention viewed from the front,
- Figure 2 shows the striker plate arrangement of Figure 1 viewed from one end,
- Figure 3 shows the striker plate arrangement of Figure 1 viewed from below, and
- Figure 4 shows the striker plate of the striker plate arrangement of Figure 1 viewed straight from the side.

[0017] The striker plate 1 shown in the attached drawings is intended to be mounted to a door frame for operating as the counterpart for a door lock, and it includes a bolt opening 2 arranged in the front surface, into which a bolt of the lock may enter. In conjunction with and behind the striker plate, a bolt casing piece 3 is arranged, which is displaceable with respect to the striker plate 1, to be more exact, in a transverse direction with respect to the longitudinal direction of the striker plate and parallel with the striker plate surface level. Certain components of the bolt casing piece 3 remaining behind the striker plate 1 are represented by broken line in Figure 1. The striker plate 1 includes guiding means 4 for the bolt casing piece extending from the bolt casing piece to the backside thereof. The guiding means comprise a first section 4.1 and a second section 4.2. Advantageously, the first section 4.1 of the guiding means 4 is formed of the planar material of the striker plate 1 by bending at least part of the material, remaining otherwise in the area of the bolt opening, from the surface of the striker plate behind it. The first section 4.1 controls and restricts the relative movement between the striker plate 1 and the bolt casing piece 3 mainly in the transverse direction thereof. The bolt casing piece 3 comprises a plane surface 3.2 parallel with the striker plate surface and it is arranged in connection with the striker plate surface so that their possible mutual displacement takes place substantially parallel with the striker plate surface.

[0018] The bolt casing piece includes a space 5, such as a slot, in which the first section 4.1 of the guiding means can be inserted. With the combined effect of the said first section 4.1 and the slot-like space 5, the bolt casing piece may move at the level of the striker plate surface in the transverse direction of the striker plate, due to which the bolt casing 3.1 arranged in the bolt casing piece 3 will also move with respect to the bolt opening of the striker plate. In this way, the position of the bolt casing piece 3 determines the position of a door, in which the lock bolt may protrude from the bolt opening 2 into the bolt casing. The dimensions of the slot-like space 5 in the longitudinal direction of the bolt casing piece 3 correspond to the dimensions of the guiding means in a corresponding direction, in other words its size it such that the first section 4.1 of the guiding means only just fits into it. Furthermore, the space 5 is larger in the transverse direction of the bolt casing piece than the dimension of the first section of the guiding means in a corresponding direction, which enables the movement of the first section in the slot-like space 5.

[0019] The striker plate 1 has openings 6 at both its ends for fastening thereof. The bolt casing piece extends essentially over the whole length of the striker plate. At the position of the openings of the striker plate 1 there are long holes 7 arranged in the bolt casing piece 3, in the transverse direction thereof, which enable different positions of the bolt casing piece during the installation. The long holes 7 and the slot-like space 5, as well as the openings 6 and the first section 4.1 of the guiding means are located with respect to each other so that their positions enable relative displacement of the bolt casing piece 3 and the striker plate 1.

[0020] The structure of the striker plate arrangement is such that when it is mounted on a frame, the bolt cas-

ing piece 3 is compressed between the striker plate 1 and the surface of the frame and therefore its movement is prevented in normal use. When adjustment is needed, e.g. due to compressing of the door seals, the fixing screws of the striker plate arrangement (not shown) are loosened. Consequently, the bolt casing piece under the striker plate may be moved in the transverse direction to a new position and, after this, the fixing screws can be tightened again. Grooves or the like (not shown) may be formed in the counter surfaces of the striker plate and the bolt casing piece, extending in the longitudinal direction thereof and by means of which the possibility of their relative movement in the transverse direction can be reduced when they are fastened.

[0021] The guiding means 4 are more clearly disclosed in Figures 2 and 4. The first section 4.1 of these is advantageously formed by bending behind the striker plate, or below it in Figure 2, a part of the plate material to be removed from the position of the bolt opening in conjunction with the formation of the bolt opening of the striker plate. The said first section 4.1 is advantageously parallel with the surface normal of the striker plate. It can also have other orientations and in such a case the shape or the angle of the slot-like space 5 with respect to the striker plate surface level should correspond to the direction of the section 4.1. In this way advantage can be taken of the material otherwise removed from the position of the bolt opening and, at the same time, the first section 4.1 becomes a planar part in a simple way. Additionally, the support and control of the bolt casing piece 3 is reliable and simple.

[0022] The guiding means comprise also a second section 4.2, which is arranged to the end of the first section 4.1 essentially parallel with the surface of the striker plate 1 and at a certain distance from the surface of the striker plate. The said second section 4.2 may have the shape of a cylindrical spindle or the like. In Figure 2, the first section is provided by pressing plate-like material of the first section 4.1 with a convenient tool so that a protrusion is formed thereon. It is arranged to extend away from the bolt opening. The second section 4.2 of the guiding means is also arranged in conjunction with guiding openings 8 arranged in the bolt casing piece so that the protrusion is moved under guidance of the guiding openings 8. In accordance with the arrangement the guiding means and the guiding opening determine together the relative position of the bolt casing piece and the striker plate. The guiding openings form a closed circle, in other words they are formed around and define an opening. In this case, the second section 4.2 of the guiding and securing means is located in the opening determined by the guiding openings. This also locks the striker plate 1 and the bolt casing piece to each other in a displaceable manner, but so that they remain in connection with each other. In this way, the striker plate 1 and the bolt casing piece can be kept together also when the arrangement is not mounted on a door frame. The guiding opening comprises two parallel surface sections 8.1, 8.2 essentially at a second distance from each other, of which the second surface section 8.2 further comprises at least one zone 8.3, in the area of which the surface sections are locally closer to each other than the second distance. Consequently, in the areas outside the zone 8.3, fitting of the second section of the guiding and securing means to the opening is looser and it moves into its position more easily in these areas. The zone 8.3 is advantageously a curved surface. With this solution, default-type positions are provided for the striker plate and the bolt casing piece.

[0023] In Figure 4, the striker plate is shown straight from the side. Here it can be clearly seen that the openings 6 are formed in such a way that the striker plate turns from the edges of the opening from the striker plate back surface (below in Figure 4) and extends over a certain distance. The bolt casing piece 3 comprises, at the position of each opening 6 of the striker plate 1, a guide groove 9 or the like, in the area of which also the long holes 7 of the bolt casing piece 3 are arranged. With the combined effect of these, the guiding of the movement between the striker plate 1 and the bolt casing piece is improved. In Figure 4, differing from the other Figures, the second section 4.2 of the guiding means is formed by bending the end of the first section away from the bolt opening.

[0024] The invention is not limited to the embodiments disclosed, but several modifications thereof are feasible within the scope of the ensuing claims. For example, the second section 4.2 of each of the guiding means may also extend towards the bolt opening, in which case also the bolt casing piece guiding openings 8.1, 8.2, 8.3 are arranged to correspond thereto.

Claims

1. An adjustable striker plate arrangement for a door, which comprises a striker plate (1) and a bolt opening (2) arranged to its front surface and a bolt casing piece (3) displaceable with respect to the striker plate, **characterized in that** the striker plate (1) comprises guiding means (4, 4.1, 4.2) arranged as an integral part of the bolt casing piece (3), and **in that** the bolt casing piece (3) comprises at least one guiding opening (8, 8.1, 8.2, 8.3) for the guiding means (4, 4.1, 4.2) so that the guiding means (4, 4.1, 4.2) and the said guiding opening (8, 8.1, 8.2, 8.3) determine together the relative position of the bolt casing piece (3) and the striker plate (1).

2. A striker plate arrangement according to claim 1, **characterized in that** the guiding means (4, 4.1, 4.2) are arranged to extend behind the striker plate (1) over a first distance from its back surface, and that the guiding means (4, 4.1, 4.2) essentially comprise both a first section (4.1) parallel with a surface normal to the striker plate and a second section

(4.2) parallel with the plane of the surface, and **in that** the said guiding opening (8, 8.1, 8.2, 8.3) of the bolt casing piece (3) is arranged essentially over the first distance from the back surface of the striker plate (1) to cooperate with the said second section (4.2).

3. A striker plate arrangement according to claim 1 or 2, **characterized in that** the bolt casing piece (3) comprises free space for the guiding means (4, 4.1, 4.2), the dimensions of which space in the longitudinal direction of the bolt casing piece (3) correspond to the dimensions of the guiding means (4, 4.1, 4.2) in a corresponding direction, and which space is larger in dimension in the transverse direction of the bolt casing piece (3) than the dimension of the guiding means (4, 4.1, 4.2) in a corresponding direction.

4. A striker plate arrangement according to claim 1, **characterized in that** the guiding means (4, 4.1, 4.2) and the said guiding opening (8, 8.1, 8.2, 8.3) together allow the movement of the bolt casing piece with respect to the striker plate (1) essentially in the plane of the striker plate and in a transverse direction with respect to the longitudinal axis of the striker plate.

5. A striker plate arrangement according to claim 2, **characterized in that** the guiding opening (8, 8.1, 8.2, 8.3) comprises two parallel surface sections (8.1, 8.2) essentially spaced by a second distance from each other, one surface section of which further comprises at least one zone (8.3), in the area of which the surface sections are locally closer to each other than the second distance.

6. A striker plate arrangement according to claim 1, **characterized in that** the first section (4.1) of the guiding means (4, 4.1, 4.2) parallel with the normal to the striker plate is connected with the striker plate in the vicinity of the edge of the bolt opening (2) of the striker plate at a first end of the first section, and **in that** the second section (4.2) parallel with the plane of the guiding means (4, 4.1, 4.2) extends from a second end of the first section away from the bolt opening (2) parallel with the plane of striker plate.

7. A striker plate arrangement according to claim 6, **characterized in that** the first section (4.1) is formed of the planar material of the striker plate (1) by bending at least part of the striker plate material, otherwise remaining in the bolt opening (2) area, behind the striker plate (1).

8. A striker plate arrangement according to any one of claims 1-7, **characterized in that** the bolt casing piece (3) comprises, parallel to the striker plate (1), a plane (3.2), which has essentially the same size as the striker plate (1) in the longitudinal direction thereof and which is smaller than the striker plate in the transverse direction thereof, and **in that** there is a bolt casing (3.1) arranged on the said plane.

9. A striker plate arrangement according to claim 8, **characterized in that** the striker plate (1) comprises openings (6) on two sides of the bolt opening, and that the bolt casing piece (3) extends beyond the openings (6) and comprises openings (7) at the position of the openings (6) of the striker plate (1), and **in that** the openings of the bolt casing piece (3) are oblong in the transverse direction of the bolt casing piece (3).

10. A striker plate arrangement according to claim 2, **characterized in that** the bolt casing piece (3) comprises a bolt casing (3.1) and slot-like spaces (5) extending in the transverse direction of the bolt casing piece arranged on both sides thereof for the first sections (4.1) of the guiding means (4, 4.1, 4.2).

11. A striker plate arrangement according to claim 10, **characterized in that** the slot-like spaces (5) extend from one edge of the bolt casing piece to the bolt casing (3.1) area.

12. A striker plate arrangement according to claim 6, **characterized in that** the second section (4.2) is formed as an extension of the first section (4.1) from the same blank.

13. A striker plate arrangement according to claim 2, **characterized in that** the said second section (4.2) and the guiding opening (8, 8.1, 8.2, 8.3) interact with respect to each other such that the bolt casing piece (3) and the striker plate (1) are interlocked in a displaceable manner.

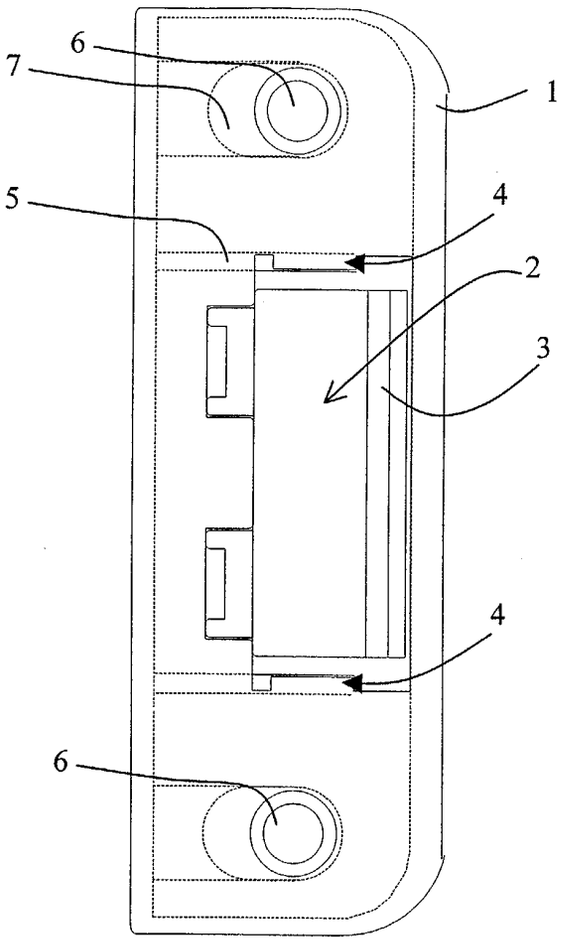

Fig. 1

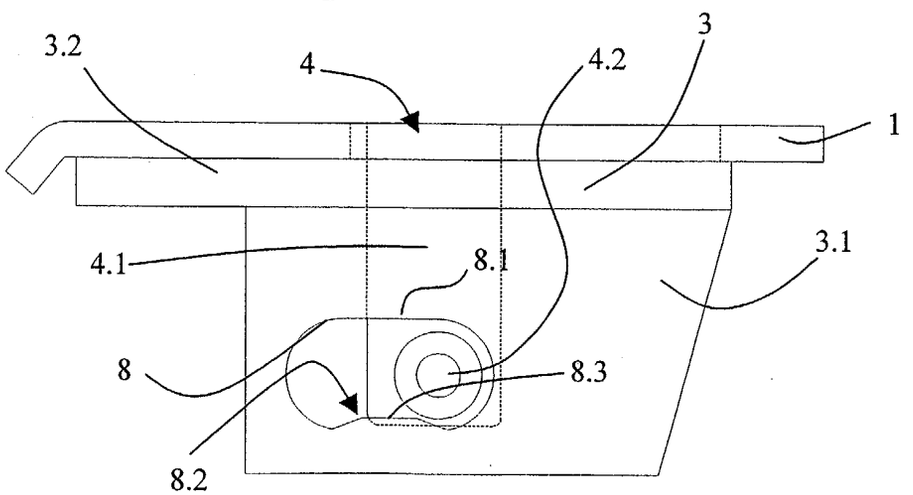

Fig. 2

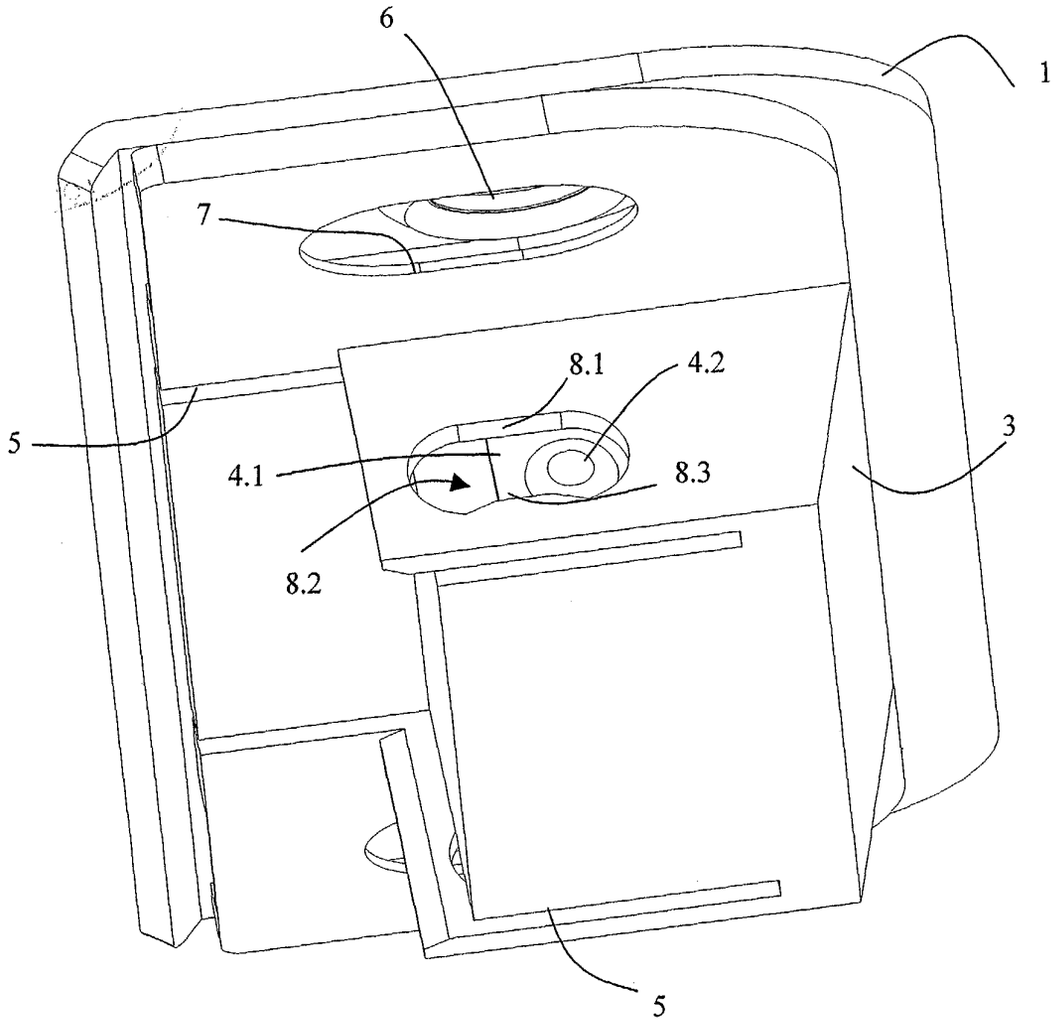

Fig. 3

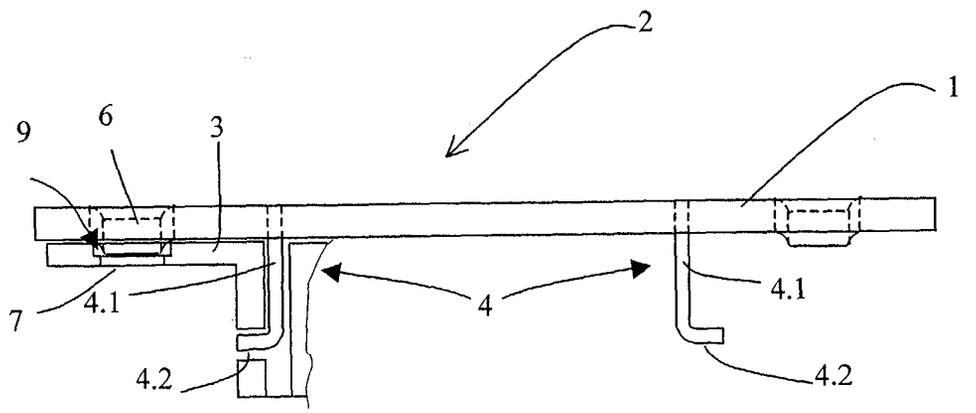

Fig. 4