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(54) A clip for fastening a glazing bead to a window frame, such a glazing bead, a method for fastening the glazing bead and use of the clip and the glazing bead

(57) The invention concerns a clip for securing a glazing bead (12) to a window frame (10) and such a glazing bead. The invention also concerns a method for mounting the glazing bead (12) to the clip. The clip is provided with first tongues (2) and second tongues (7) intended for engaging a first groove (23) and a second groove (24) in the glazing bead (12). The invention is distinguished by it being possible to mount the glazing bead (12) to the window frame (10) by moving the glazing bead (12) inward against a glass pane perpendicular to the plane of the glass pane. This means that it is possible with the same system, even with the last glazing beads (12), to assemble these in a mitre joint with adjacent glazing beads (12) at the ends of the glazing bead. Furthermore, the security against burglary through the glass pane is considerably increased as it by and large is impossible to remove the glazing bead without destroying the glazing bead (12) and removing the clips.

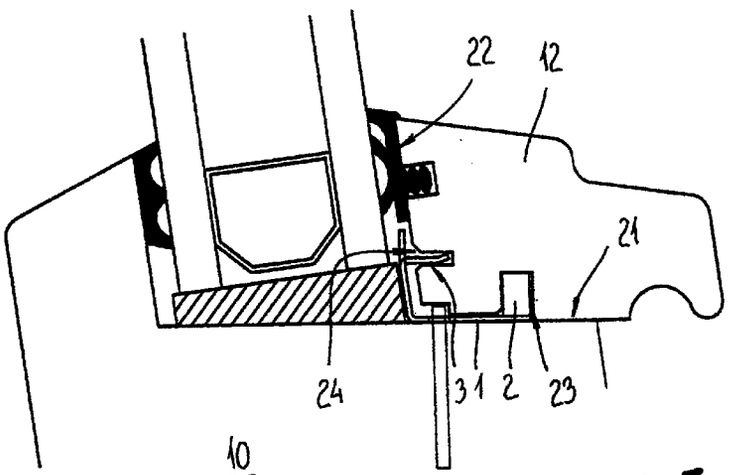

FIG. 5

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Description

[0001] The present invention relates to a clip for fastening solid glazing beads to a window frame for holding a glass pane to the window frame, and which glass beads are mounted perpendicularly to a longitudinal direction of the glazing bead, which clip comprises a base part intended to abut on the window frame and to be fastened to this with suitable means, and which clip in addition comprises a first tongue extending mainly perpendicularly outward from the base part and is intended to engage a first groove extending in the glazing bead in parallel with the longitudinal direction of the glazing bead, and a second tongue extending mainly in parallel with the base part, which second tongue is intended for engagement with a second groove in the glazing bead, and where the first tongue is capable of yielding inward against the base part and capable of moving back to its extension mainly perpendicularly outward from the base part. The invention furthermore relates to a solid glazing bead for use in connection with such a clip, which glazing bead has a first edge intended for facing a lateral face of the rabbet of the window frame when fastening the glazing bead to the window frame, and has a second edge intended for facing a glass pane when fastening the glazing bead to the window frame, which glazing bead is provided with a first groove extending in the first edge along the glazing bead.

[0002] Besides, the invention relates to a method for mounting the glazing bead to the clip and the use of the clip and the glazing bead.

[0003] Mounting of glass panes for window frames in windows usually takes place today by means of external glazing beads for keeping the glass pane in abutment on an internal abutment edge for the glass pane in the window frame.

[0004] Several systems for use in window frames are known in which the glazing bead is made of a section of plastic or metal. This gives great degrees of freedom with respect to the shape of the glazing bead and with respect to fastening the glazing bead to the window frame.

[0005] However, if the glazing bead is made of wood, the number of degrees of freedom are reduced considerably because of the lacking strength of the wood as compared to plastic and metal, and because wood has considerably fewer degrees of freedom with respect to shaping and choice of section of the bead compared to beads of plastic and metal.

[0006] Wooden beads are usually fastened to the window frames by means of brads that are nailed through the glazing bead and further on down into the window frame. However, this implies several drawbacks. Firstly, aesthetically it is not so nice that there are visible brads or at least visibly bradded brads into the glazing bead. Secondly, the hole formed by the nail through the glazing bead implies risk that moisture may penetrate down in the glazing bead. Thirdly, there is a risk that the nail, because of shifting temperatures and degrees of moisture, works itself partly free from the window frame and the glazing bead in such a way that the holding of the glass pane to the window frame deteriorates.

[0007] DK 96 00357 U3 discloses a mounting system for mounting the bottom glazing bead of wood to a window frame without using nails for fastening the glazing bead. The system comprises a moulding intended for being fastened to the window frame and which is capable of holding the bottom glazing bead to the window frame. The moulding is formed with a groove with which a tongue and a groove on the corresponding bottom glazing bead may come into self locking, rotationally rigid engagement with the moulding. The bottom glazing bead is thus held fixed both in direction outward from the glass pane and in direction upward in parallel with the glass pane.

[0008] This system, however, implies considerable drawbacks. The mounting of the glazing bead to the moulding takes place by moving the bottom glazing bead downward against the moulding in a direction in parallel with the plane of the glass pane. This is constructionally sensible as long as this mounting only concerns the bottom glazing bead. When mounting the upper glazing bead which is mounted as the second glazing bead, and side glazing beads that are mounted as the latter glazing beads, it is to be preferred that the transition between side glazing beads and upper glazing bead forms a mitre joint. This is, however, not possible with such a moulding as it requires that the last mounted glazing beads are mounted in direction in parallel with the glazing bead and not perpendicular to it, which, however, is the only way to mount the latter glazing bead in order to achieve a mitre joint. This means that it is necessary to use another mounting system for mounting the side glazing beads, e.g. nailing. It is a drawback that different mounting systems have to be used for different glazing beads. The holding of the glazing bead to the moulding by means of tongue and groove is very weak as the depth of the groove and the height on the tongue, respectively, is limited if the glazing bead is to be mounted to the moulding anyway.

[0009] DK 1473/89 describes a snap lock which is capable of holding, for example, a glass pane in relation to a window or door frame and which is capable of holding a bead in relation to the snap lock itself. The snap lock is the element holding the glass pane to the window frame and the beads fastened to the snap lock thus only constitute decorative headings and have as such no function in connection with the holding of the glass pane to the window frame. The snap lock has a rounded section so that the holding of the glazing bead is sufficiently weak in order that the glazing bead may be demounted without deforming the glazing bead.

[0010] The construction in this publication is not capable of really fastening the glazing bead to the window frame, but only capable of holding the glazing bead.

This means that this construction is not capable of securing against burglary as the glazing bead without difficulties may be demounted and the pane subsequently may be removed from the window or door frame. Furthermore, spring action takes place in a plane in parallel with a direction of mounting for the glazing bead which makes it very easy to demount the glazing bead which is also the purpose of the described glazing bead. This increases the risk of burglary by removal of the glass pane from the window frame.

[0011] DE 1 659 363 describes a sectional piece with a holding spring. The sectional piece is made of metal and provided with a tongue intended to engage a corresponding bend on the flexible tongue. With the section described in this patent publication it is possible to hold the glazing bead so that this will not subsequently be removed from the frame element such as a window frame which a glass pane is held to by means of the glazing bead and the flexible tongue.

[0012] This construction is quite different than a solid glazing bead of wood or other material, and a hollow glazing bead of metal as shown implies many more possibilities for forming the glazing bead in order to achieve the desired effect in relation to a solid glazing bead. Furthermore, spring action takes place in a plane in parallel with a direction of mounting for the glazing bead which still increases the risk that the glazing bead may be pulled out of its engagement with the clip, possibly with a deformation of only a lesser part of the bracket the clip. This implies that it is very easy subsequently to demount the bottom glazing bead which to a large degree increases the degree of burglary by removing the glass pane from the window frame.

[0013] Therefore, it is the purpose with the present invention to provide means that makes it possible to mount glazing beads where the transition between the first mounted glazing beads and the last mounted glazing bead form a mitre joint and where the security against burglary by demounting or deformation of the glazing bead is considerably higher.

[0014] This purpose is achieved with a clip which is characterised in that the first tongue consists of at least one bracket extending outward from the base part, that the least one bracket extends laterally in relation to a direction of mounting for the glazing bead, and that spring action of the first tongue inward and outward in relation to the base part takes place in a plane perpendicular to the direction of mounting for the glazing bead.

[0015] A preferred embodiment for the clip has a second tongue consisting of at least one flap extending in a first section at an angle mainly perpendicular outward from the base part, and has a second section at an angle mainly perpendicularly outward from the first section, and is peculiar in that the clip comprises a third section and that the third section extends at an angle from the second section outward relative to the base part.

[0016] A glazing bead for use in connection with the clip is characterised in that the first groove has a width, that the second groove has a depth, that the depth of the second groove is greater than the width of the first groove, and that the preferred third section of the clip at the mounting of the glazing bead is intended for engaging the second groove before engagement is commenced between the first groove and the bracket on the clip so that the clip is not capable of being displaced out of the groove.

[0017] By providing possibility for yielding of the first tongue inward against the base part, there is opened the possibility that mounting of the glazing bead may take place in quite another way than previously. The glazing bead may now be mounted in a direction against the glass pane which is perpendicular to the glass pane. This implies that by the same mounting system as for the first mounted glazing beads it is possible to mount the last mounted glazing bead with the adjacent glazing beads simultaneously with maintaining a transition constituting a mitre joint. Previously it has been necessary to use traditional mounting with brads by mounting the last glazing bead in order to maintain a mitre joint which for a traditionally four-sided window is between the upper glazing bead and the side glazing beads. The last mounted glazing beads are usually the side glazing beads, but may also be some other of the glazing beads.

[0018] Besides, there is a possibility that the second groove in the glazing bead has a depth and the second tongue has an extension which is so great that the possibility that the glazing bead may be removed by displacing the glazing bead in parallel with the plane of the glass pane is eliminated. The risk that burglary takes place by demounting the glazing beads is therefore also eliminated, and burglary can only take place by breaking the glazing bead off by means of a screw driver or crowbar, and which only can take place by destroying the glazing bead and thereafter remove all the clips. If the glazing bead is very strong or made of a strong material such as metal, it is thus by and large impossible to perform burglary by attempting to destroy the glazing bead.

[0019] In connection with the above-mentioned advantages, the invention thus also comprises a method for mounting the glazing bead to the clip, and which method comprises providing first glazing beads with cut-off ends for forming joints with ends of adjacent glazing beads, of which at least one cut-off end is for forming a mitre joint, and where at least a number of the first glazing beads are moved inward against the glass pane in a direction perpendicular to the plane of the glass pane, and which method is characterised in that a last glazing bead is provided with at least one cut-off end for forming a mitre joint with the said at least one cut-off end of the first glazing beads, and that the last glazing bead also is moved inward against the glass pane m a direction perpendicular to the plane of the glass pane.

[0020] The invention will hereafter be described more closely with reference to the accompanying drawing, where

Fig. 1 is a view of a clip according to the invention as seen from the side,
Fig. 2 is a view of a clip according to the invention as seen from the front,
Fig. 3 is a view of a clip according to the invention as seen from above,
Fig. 4 is a section through a first embodiment of a glazing bead according to the invention and held to a window frame with the clip according to the invention, and
Fig. 5 is a section through a second embodiment of a glazing bead according to the invention and held to a window frame with the clip according to the invention,
Fig. 6 is a section through the first embodiment for a glazing bead according to the invention and held to a window frame with a second embodiment for a clip.

[0021] Fig. 1, Fig. 2 and Fig. 3 show a clip intended to be fastened to a window frame (see Fig. 4 and Fig. 5) and to hold a glazing bead (see Fig. 4 and Fig. 5) to the window frame.

[0022] The clip consists of a base part 1, of two first tongues 2 and of two second tongues 3. The base part 1 is provided with two holes 4 for, by means of nails, screws, rivets, or staples (see Fig. 4 and Fig. 5) to fasten the clip 1 to the window frame. Alternatively, the base part 1 may be provided with another number of holes. The two first tongues 2 constitute brackets extending from the outer edge 5 of the base part 1 upward in an arc and downward in an arc against the middle 6 of the base part 1. The two first tongues 2 have a apex T which in a flexible way may be displaced downward against the base part 1.

[0023] The two other tongues 3 consist of a first section 7 and a second section 8 and in the shown embodiment also a third section 9. The first section 7 extends relative to the base part 1 at an obtuse angle α which, however, is by and large equal to a right angle, outward from the base part 1. The second section 8 extends relative to the first section 7 at an acute angle β which, however, is by and large equal to a right angle, forward of the first section 7. The second section 8 of the second tongues is parallel with the base part 1. The second section has an extension d. The third section extends relative to the second section 8 at an angle γ, which is obtuse outward in relation to the base part 1.

[0024] The first section 7 extends outward at an obtuse angle and not in an exact right angle in order to allow the possibility of using the clip in a window frame as shown in Fig. 5.

[0025] Fig. 4 shows a first embodiment of a window frame 10 to which a glass pane 11 is held feed by means of a glazing bead 12 held to the window frame 10 by means of a clip according to the invention. The window frame 10 comprises an inner face 13 of the rabbet for a plane 14 of the glass pane 11, and a lateral face of the rabbet of an edge 16 of the glass pane 11. The glass pane 11 in the shown embodiment is an insulating glass unit with double layers of glass. The glass pane may, however, be any kind with a single or more layers of glass. Between the inner face 13 of the rabbet and the plane 14 of the glass pane 11, there is provided a sealing strip 17. Between the lateral face 15 of the rabbet and the edge 16 of the glass pane 11 there is provided a spacer 18.

[0026] By means of a staple 19, alternatively nails, screws, or rivets, the clip is fastened to the lateral face 15 of the rabbet of the window frame 10 between the glass pane 11 and an external side 20 of the window frame 10. The glazing bead 12 is held to the window frame 10 by means of the clip. The glazing bead has a first edge 21 facing the lateral face 15 of the rabbet of the window frame 10, and the second edge facing the glass pane 11. The first edge 21 is provided with a first groove 23, and the second edge 22 is provided with a second groove 24. The first groove has a width C, and the second a depth D. A third groove 25 is intended for holding a sealing strip 26 to the glazing bead 12.

[0027] The first tongues 2 of the clip extend inward in the first groove 23, and the second tongues 3 of the clip extend inward in the second groove 24. The engagement between the second tongues 23 and the second groove 24 may also be viewed as if there is formed a rail 27 between the first edge 22 of the glazing bead 21 and the second groove 24, extending inward into the interspace between the base part 1 and the second tongues 3 of the clip.

[0028] The engagement between the first tongues 2 and the first groove 23 prevents completely that the glazing bead 12 may be displaced outward relative to the glass pane 11. This means that the sealing strip 26 always will be sufficiently squeezed against the glass pane 11. The engagement between the second tongues 3 and the second groove 24 completely prevents that the glazing bead 12 may be displaced upward along the glass pane 11 as the second section 8 of the second tongues 3 as well as the second groove 24 has a considerable extension d and D, respectively. This implies that after mounting there is no possibility what so ever of removing the glazing bead 12 from the window frame 10.

[0029] Fig. 5 shows a securing of a glazing bead to a window frame corresponding to the securing taking place in Fig. 4. The difference is that the lateral face 15 of the rabbet of the window frame 10 slopes downward a little. This is a section of the window frame lowermost in the window frame 10 where it is important that possible moisture penetrating down to the lateral face 15 of the rabbet may run off the external side of the window frame 10. As a difference from this, Fig. 4 shows a sec-

tion of the window frame 10 in the sides of the window frame 10 or uppermost in the window frame 10, where moisture cannot be collected and where it thus is necessary to create a possibility for moisture to run off.

[0030] Mounting of the glazing bead shown in Fig. 4 and Fig. 5 takes place in the following way. Initially, the glass pane 11 is mounted in the window frame 10 at the same time as the inner sealing strip 17 and the spacer 18 are placed between the glass pane 11 and the inner face 13 of the rabbet and the lateral face 15 of the rabbet, respectively, of the window frame 10. Then the clips are fastened to the window frame 10 with mutual spacing. At the outset, the clips will be used uppermost as well as in the sides and lowermost in the window frame 10 so that the same system for securing the glazing beads is used along the whole window frame. However, it will be possible with the method according to the invention to use other means to fasten one or more of the first glazing beads and just to use clips according to the invention for securing the last glazing bead, or to use clips according to the invention to secure one or more of the first glazing beads and to use other means for fastening the last glazing bead. The first glazing beads will usually be the bottom glazing bead and the upper glazing bead, while the last glazing beads usually will be the side glazing beads.

[0031] After having mounted the clips, the glazing bead 12 is mounted to the clips. Before that, the external sealing strip 26 is mounted in the third groove 25 of the glazing bead 12. The glazing bead 12 is initially mounted by placing the glazing bead 12 as shown with stippled line. Hereafter, the glazing bead 12 is moved to its proper position as shown with the arrow. This takes place by first moving the glazing bead downwards so that the first edge of the glazing bead is used to press the first tongues 2 downwards against the base part 1 so that the second groove 24 of the glazing bead 12 is situated immediately opposite the second tongues 3.

[0032] Before the glazing bead 12 is moved to its position as shown with the arrow, the glazing bead 12 in the shown embodiment may be moved downward against the clip at an angle so that the second groove 24 and the third section 9 of the clip engage each other. By the subsequent mounting it is then easier to guide the glazing bead 12 to its position if the second groove 24 has got hold of the third section 9 before engagement is established between the second groove 24 and the second section 8 and between the first groove 23 and the bracket 2, respectively. This is achieved when the depth C of the second groove 24 is greater than the width D of the first groove 23.

[0033] Hereafter, the glazing bead 12 is moved inward against the glass pane 11 in a direction perpendicular to the plane 14 of the glass pane 11. Hereby, the second tongues 3 engage the second groove 24 simultaneously with the first tongues 2 still are pressed downward and slide along the first edge 21 of the glazing bead 12. When the glazing bead 12 has been moved sufficiently inward against the glass pane 11, the first tongues 2 are opposite the first groove 23. The first tongues 2 then go back to their initial position (see Figs. 1-3) and engage the first groove 23. The glazing bead 12 is then completely secured relative to the window frame 10 in a direction upward and inward perpendicular to the plane 14 of the glass pane 11 as well as in a direction upward in parallel with the plane 14 of the glass plane 11.

[0034] In the shown embodiment, the clip is provided with a third tongue 28 extending outward from the base part 1. The third tongue 28 is formed between the two second tongues 3 (see Figs. 1-3). When the glazing bead 12 by means of the clip is secured to the window frame 10, a part 29 of the outer sealing strip 26 which is mounted in the third groove 25 of the glazing bead, will be held between the second edge 22 of the glazing bead 12 and the third tongue 28.

[0035] Fig. 6 shows securing of a first embodiment of a glazing bead 12 by means of a second embodiment of a clip. As the first embodiment of the clip, the clip likewise comprises a base part 1, first tongues 2 and second tongues 3. Besides that, the clip comprises a fourth tongue 30 extending from the base part 1 and inward against the glass pane 11. The fourth tongue 30 is provided with a barb 31. The barb 31 catches the lateral face 15 of the rabbet of the window frame 10 and secures the fourth tongue 30 and thereby also all of the clip to the window frame 10.

[0036] Possibly, it will thus be possible, as shown, to eliminate the use of staples, or alternatively, nails, screws, or rivets for fastening the clip to the window frame 10. Hereby, mounting of the clip becomes considerably easier. The second embodiment of the clip is shown in a part of the window frame corresponding to the part of the window frame shown in Fig. 4. The second embodiment of the clip can, however, also be used in the part of a window frame corresponding to the part of the window frame shown in Fig. 5.

[0037] The invention has been described above with reference to a specific embodiment of a clip according to the invention and a glazing bead according to the invention belonging to it. The clip will preferably be made of metal, but may also be made of plastic. In the shown embodiment, the clip constitutes an element intended to be fastened to the window frame with mutual spacing for other corresponding clips. The clip may, however, also constitute a bead extending over a longer stretch of the window frame. The embodiment of the first tongues may be otherwise, e.g. the tongues can extend outward from the base part, but without also extending inward against the base part.

Claims

1. A clip for fastening solid glazing beads (12) to a window frame (10) for holding a glass pane (11) to the window frame (10), and which glass beads are mounted perpendicularly to a longitudinal direction

of the glazing bead, which clip comprises a base part (1) intended to abut on the window frame (10) and to be fastened to this with suitable means, and which clip in addition comprises a first tongue (2) extending mainly perpendicularly outward from the base part (1) and is intended to engage a first groove (23) extending in the glazing bead (12) in parallel with the longitudinal direction of the glazing bead, and a second tongue (3) extending mainly in parallel with the base part (1), which second tongue (3) is intended for engagement with a second groove (24) in the glazing bead (12), and where the first tongue (2) is capable of yielding inward against the base part (1) and capable of moving back to its extension mainly perpendicularly outward from the base part (1), **characterised** in that the first tongue (2) consists of at least one bracket extending outward from the base part (1), that the least one bracket (2) extends laterally in relation to a direction of mounting for the glazing bead, and that spring action of the first tongue (2) inward and outward in relation to the base part (1) takes place in a plane perpendicular to the direction of mounting for the glazing bead.

2. A clip according to claim 1, **characterised** in that the first tongue (2) consists of at least one bracket extending laterally relative to the mounting direction for the glazing bead outward from the base part, extending preferably laterally relative to the mounting direction for the glazing bead from the base part (1) in an arc outward from the base part to an apex (T) for the arc and inward against the base part (1) from the apex (T).

3. A clip according to claim 1 or claim 2 where the second tongue (3) consists of at least one flap extending in a first section (7) at an angle (α) mainly perpendicular outward from the base part (1), and a second section (8) at an angle (β) mainly perpendicularly outward from the first section (7), **characterised** in that the clip comprises a third section (9) and that the third section extends at an angle (γ) from the second section outward relative to the base part (1).

4. A clip according to any of claims 1 - 3, **characterised** in that the clip comprises a third tongue (28) extending mainly perpendicularly outward from the base part (1) at the rearmost part of the clip.

5. A clip according to any of claims 1 - 4, **characterised** in that that the clip comprises a fourth tongue (30) extending outward in direction in parallel with the base part (1) and in direction away from the first tongues (2), and which fourth tongue (30) is provided with a barb (31).

6. A glazing bead which is solid for use in connection with a clip according to any of claims 3 - 5, which glazing bead has a first edge (21) intended for facing a lateral face of the rabbet (15) of the window frame (10) when fastening the glazing bead (12) to the window frame (10), and has a second edge (22) intended for facing a glass pane (12) when fastening the glazing bead (12) to the window frame (10), which glazing bead (12) is provided with a first groove (23) extending in the first edge (21) along the glazing bead (12), the glazing bead (12) additionally being provided with a second groove (24) extending in the second edge (22) along the glazing bead (12) and which has such a depth that a second tongue (3) of a clip at the mounting of the glazing bead (12) to the clip is incapable of being displaced out of the groove (24), **characterised** in that the first groove (23) has a width C, that the second groove (24) has a depth D, that the depth D of the second groove (24) is greater than the width C of the first groove (23), and that the preferred third section (9) of the clip at the mounting of the glazing bead (12) is intended for engaging the second groove (24) before engagement is commenced between the first groove (25) and the bracket (2) on the clip.

7. A glazing bead according to claim 6 for use in sides or uppermost in a window, **characterised** in that the first edge (21) forms a right angle (α) with the second edge (22).

8. A glazing bead according to claim 6 for use lowermost in a window, **characterised** in that the first edge (21) form an obtuse angle (α) with the second edge (22).

9. A method for mounting a glazing bead against a glass pane according to any of claims 6 - 8 in a window frame by means of clips according to any of claims 1 - 5, which method comprises providing first glazing beads with cut-off ends for forming joints with ends of adjacent glazing beads, of which at least one cut-off end is for forming a mitre joint, and where at least a number of the first glazing beads are moved inward against the glass pane in a direction perpendicular to the plane of the glass pane, **characterised** in that a last glazing bead is provided with at least one cut-off end for forming a mitre joint with the said at least one cut-off end of the first glazing beads, and that the last glazing bead also is moved inward against the glass pane in a direction perpendicular to the plane of the glass pane.

10. Use of clips according to any of claims 1 - 5 for mounting glazing beads according to any of claims 6 - 8.

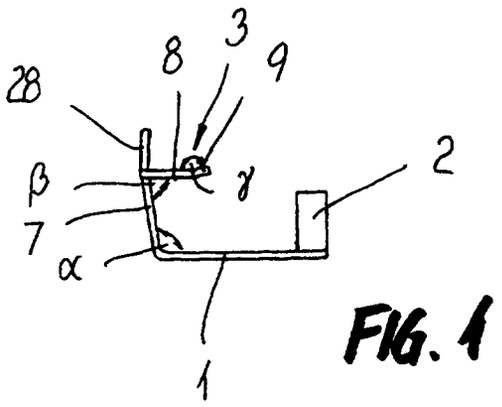

FIG. 1

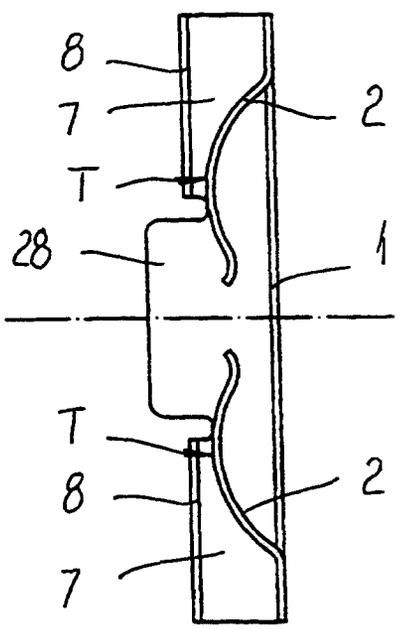

FIG. 2

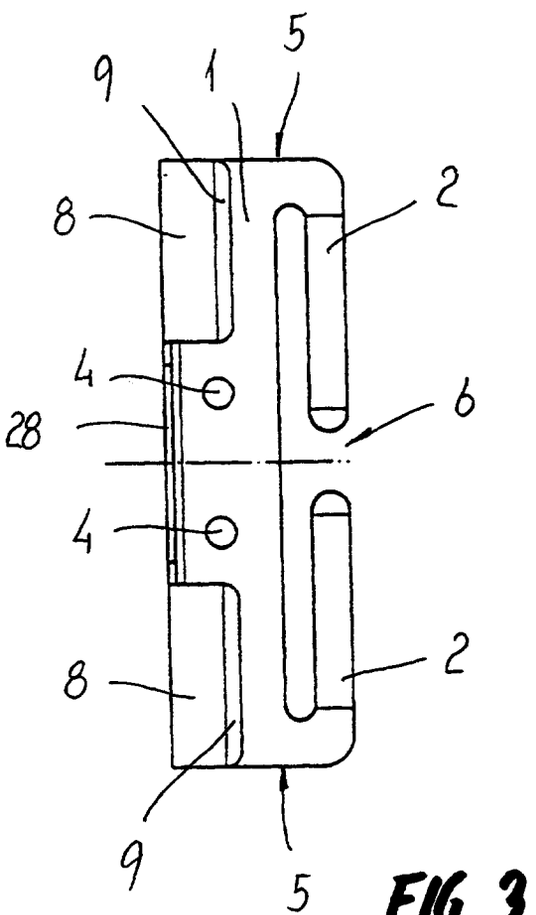

FIG. 3

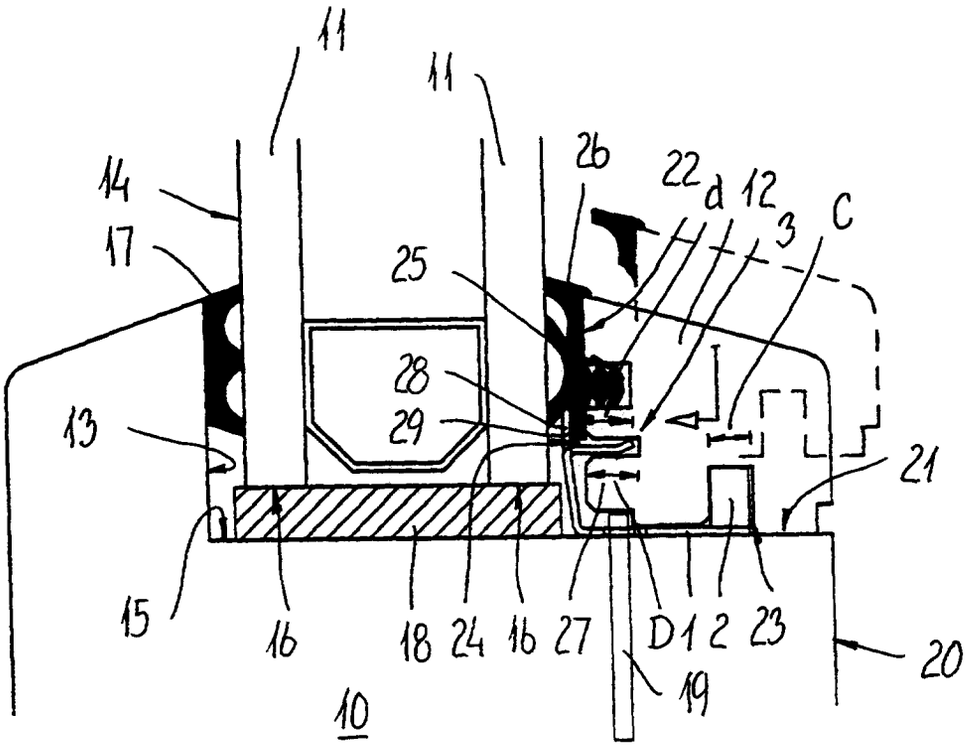
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FIG. 4

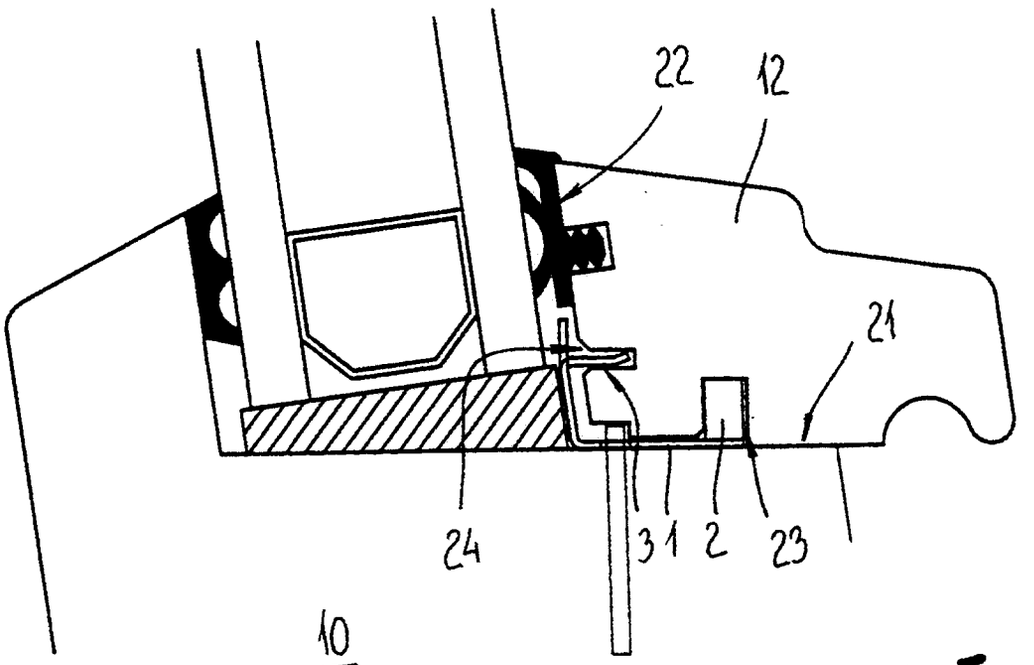

FIG. 5

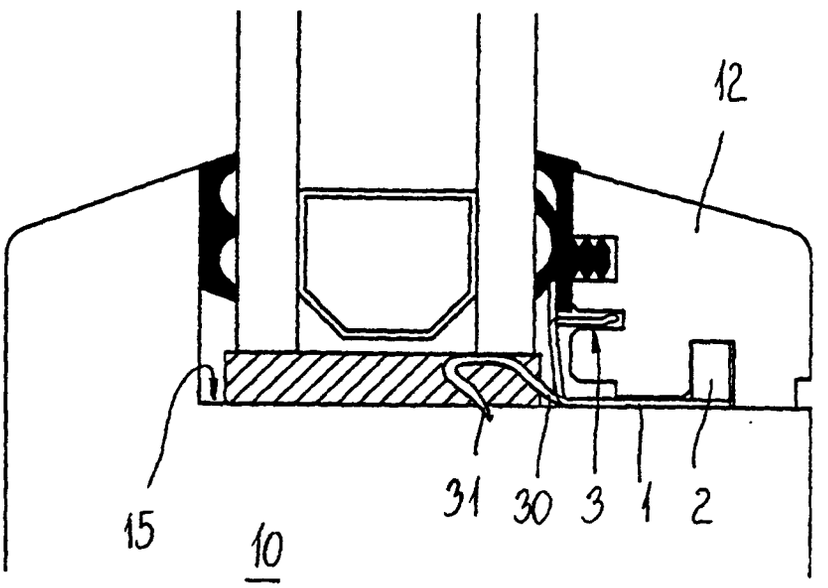

FIG. 6