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(54) **Window construction and window section having an interrupted coldbridge**

Fensterkonstruktion und Fensterprofil mit unterbrochener Kältebrücke

Construction de cadre et de profil de cadre avec pont de froid interrompu

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Description

BACKGROUND OF THE INVENTION:

Field of the invention

[0001] The invention relates to a window construction with a thermal break comprising a window profile constisting of one piece comprising a first profile which, after placing the window profile in a wall, is fastened to the wall, a second profile and an insulating joining piece between the first and the second profile, all profiles and the joining piece are joined during a production process, which window construction furthermore comprises a window which is carried by the first profile.

[0002] By a window may be meant an individual pane as well as a pane in a window frame. In the case of a pane in a window frame it may be a fixed window or a window that can be opened by hinging or sliding. In the case of an individual pane, the pane is usually fitted in the window profile. A pane can, for example, be a single pane, as well as double or triple glazing.

[0003] By carrying a window is meant, within the framework of this invention, to be in contact with the window in such a way that the forces acting on the pane and/or the window's own weight are transmitted through the profile to the wall.

[0004] In the absence of the joining piece, the first profile and the second profile form a unit through which cold from outside can penetrate to the inside and as a result condensation can form on the inner profile. In this case, the window profile forms a thermal bridge. The joining piece therefore forms the break in the thermal bridge.

Prior art

[0005] A similar window construction is known from US-A-5.454.204. In this window construction, the pane is fixed between two parts of a first window profile and the window, formed by the pane and the first window profile, is carried by two parts of a second window profile. The forces acting on the windows are therefore transmitted by the joining pieces. Because the joining pieces are made of plastic and plastic ages more rapidly and is affected more by environmental influences than metal parts, the known window construction cannot meet the same stringent requirements regarding strength as window constructions without a thermal break. Because of this, window constructions which must meet stringent requirements regarding strength are not provided with a thermal break and therefore have poor insulating properties.

Summary of the invention

[0006] An objective of the invention is to provide a window construction of the type described in the preamble with a thermal break between the first and second profile, which is suitable for applications in which the requirements with regard to strength are very stringent. For this purpose, the window construction according to the invention is characterised in that the window is carried by the first profile only and in that the first and second profile are separated by the joining piece. Because of this, the forces acting on the window are not received and transmitted by the joining piece. All the forces acting on the window are received by the first profile and transmitted to the wall. The joining piece is situated between the unloaded second profile and the loaded first profile and therefore does not have to transmit any forces. Because of this, the window construction according to the invention meets stringent requirements regarding strength and has a thermal break between the first and second profile. The window construction and the window profile according to the invention do not reduce in any way the strength of a window construction and a window profile without a thermal bridge.

[0007] It is noted from DE 20 13 370 A a window construction is known in which there is an insulating joining piece between a first and a second profile and in which a window is carried completely by the first profile which is fastened to a wall. However, in this construction, the first and the second profile form two separate parts and the joining piece is also a separate part. This is in contrast with the window profile according to the invention where the two parts and the joining piece form one unit. When assembling this known window construction, the joining piece is placed between the first and second profile, after which the second profile is snapped onto the first profile.

[0008] When bending the known window profile in order to make round windows, the joining piece often comes loose from the profiles. An embodiment of the window construction according to the invention, which can be bent while cold without a problem, is characterised in that the joining piece has at least four dovetail-shaped projections and the first and the second profile each have at least two congruent recesses in which the joining piece's projections are situated, and where the joining piece's projections and the recesses in the first and the second profile have rounded comers with a radius of at least nearly 0.2 mm. By a dovetail-shaped projection is meant that the free end is broader than the end on which the projection is attached to the rest of the joining piece. By fastening the joining piece with two projections to each profile, the attachment is so good that the window profile can be bent while cold to a radius of 100 mm.

[0009] A further embodiment of the window construction according to the invention is characterised in that the joining piece is of a polyurethane moulding resin or a polyamide strip. Because of this, the window profile can withstand high temperatures as a result of which it can be anodised and enamelled without a problem during the manufacturing process of the window construction.

[0010] The window construction is pre-eminently suitable for application in the shipbuilding industry. With ship's windows the window profiles are bent and after various processes are last of all anodised or enamelled. With the use of plastic joining pieces in the window profile these processes caused problems in the known window profiles. The joining piece was affected and lost its good properties. In addition, the joining piece often broke loose from the profiles when being bent. Because of the good attachment of the joining piece by means of the dovetail-shaped projections in the window profile according to the invention and the favourable polyurethane or polyamide material of which the joining piece is made, it is possible to use to advantage the window construction according to the invention in ship's windows with round corners.

[0011] The invention also relates to a window profile with a thermal break for application in the window construction according to one of the preceding claims, consisting of one piece comprising a first profile, a second profile and an insulating joining piece situated between the first and the second profile, where the first profile is provided with a means of attachment for fastening to a wall, as well as a means for carrying a window. The means of attachment can be executed, for example, as a rib, for example, provided with holes for attachment to a wall. The means for carrying a window can be executed, for example, as two ribs between which a window can be fixed or a rib onto which a window can be clamped. With regard to the window profile, the invention is characterised in that of the two profiles only the first profile is provided with the means of attachment for fastening to a wall and with the means for carrying a window and in that the first and second profile are separated by the joining piece.

[0012] For embodiments of the window profile according to the invention, the reader is referred to the claims. The same advantages apply to these embodiments as the above-mentioned advantages of the window construction according to the invention. application in the window construction according to the invention, consisting of a unit and comprising a first profile, a second profile and an insulating joining piece situated between the first and the second profile, where the first profile is provided with a means of attachment for fastening to a wall, as well as a means for carrying a window. The means of attachment can be executed, for example, as a rib, for example, provided with holes for attachment to a wall. The means for carrying a window can be executed, for example, as two ribs between which a window can be fixed or a rib onto which a window can be clamped. With regard to the window profile, the invention is characterised in that the second profile is not provided with a means for carrying a window.

[0013] For embodiments of the window profile according to the invention, the reader is referred to the claims. The same advantages apply to these embodiments as the above-mentioned advantages of the window construction according to the invention.

Brief description of the drawings

[0014] The invention will be elucidated more fully below on the basis of drawings in which embodiments of the window construction and the window profile according to the invention are shown. In these drawings:

Figure 1 shows a detail of the first embodiment of the window construction according to the invention mounted in a wall with a fixed insulating pane;
Figure 2 shows the window profile of the window construction shown in Figure 1;
Figure 3 shows a second embodiment of the window construction according to the invention mounted in a wall with a window frame that can be opened; and
Figure 4 shows the outer window profile of the window construction shown in Figure 3.

Detailed description of the drawings

[0015] In Figure 1 a detail of the first embodiment of the window construction according to the invention is shown. The window construction 1 is mounted in a wall 3 and has a window profile 5 with a fixed insulating pane 7. In Figure 2 the window profile 5 of the window construction 1 shown in Figure 1 is displayed.

[0016] The window profile 5 consists of a first profile 9, a second profile 11 and an insulating joining piece 13. The first profile 9 is fastened to the wall 3 and is provided with two ribs 15 en 17 between which there is double glazing 7. The joining piece 13 is situated between the first profile 9 and the second profile 11 and forms a break in the thermal bridge, which, in the absence of the joining piece 13, would be formed by the first profile 9 and the second profile 11. De passage between the second profile 11 and the rib 17 is sealed by means of an insulating strip 18.

[0017] The joining piece13 has four dovetail-shaped projections 19 situated in congruent recesses 21 in the first profile 9 and the second profile 11. Because of this, a good attachment of the joining piece 13 to the profiles 9 and 11 is obtained. In order to be able to fit the projections 19 well in the recesses 21 so that there are no cavities between the projections 19 and the recesses 21, the projections 19 of the joining piece 13 and the recesses 21 in the first profile 9 and the second profile 11 are provided with rounded comers having a radius of 0.2 mm.

[0018] The procedure for manufacturing the window profile 5 is as follows. First one profile in the form of the first profile 9 and the second profile 11 with a connecting strip 23 between them is extruded. Next polyurethane moulding resin or polyamide is poured or pressed into the space between the outside and the second profile 9, 11 and the connecting strip 23. After hardening the

connecting strip 23 is then cut away.

[0019] In Figure 3 a second embodiment of the window construction according to the invention is shown. The window construction 31 is mounted in a wall 33 and has a window profile 35 and a window frame 37 that can be opened. In Figure 4 the outer window profile 35 of the window construction 31 displayed in Figure 3 is shown.

[0020] With this window construction 31 as well, the window profile 35 has a first profile 39 and a second profile 41, which, after mounting in the wall 33, are situated on the outside 43 and the inside 45 of the wall 33 respectively. Here also there is an insulating joining piece 47 between the first profile 39 and the second profile 41 and here as well the passage between the second profile 41 and the rib 49 is sealed by an insulating strip 50.

[0021] In contrast with the first embodiment, the first profile 39 has been provided with only one rib 49 in this window construction 31. The rib 49 has an outer side 51 and an inner side 53. On the outer side 51 there is the window frame 37 with double glazing 55. The window frame 37 is fastened to the window profile 35 by means of a hinge 57.

[0022] The fitting of the joining piece 47 in the profiles 39 and 41 and the manufacture of the window profile 35 is the same as with the first embodiment.

[0023] Although in the above the invention is explained on the basis of the drawings, it should be noted that the invention is in no way limited to the embodiments shown in the drawings. The invention also extends to all embodiments deviating from the embodiments shown in the drawings within the context defined by the claims.

Claims

1. Window construction (1; 31) with a thermal break comprising a window profile (5; 35) constisting of one piece comprising a first profile (9; 39) which, after placing the window profile (5; 35) in a wall (3; 33), is fastened to the wall, a second profile (11; 41) and an insulating joining piece (13; 43) between the first and the second profile, all profiles and the joining piece are joined during a production process, which window construction (1; 31) furthermore comprises a window (7; 55) which is carried by the first profile (9; 39), **characterised in that** the window (7; 55) is carried by the first profile (9; 39) only and **in that** the first and second profile (9, 11; 39, 41) are separated by the joining piece (13; 43).

2. Window construction (1; 31) according to claim 1, **characterised in that** the joining piece (13; 43) has at least four dovetail-shaped projections (19) and the first and the second profile (9, 11; 39, 41) each have at least two congruent recesses (21) in which the joining piece's projections (19) are situated, and where the joining piece's projections (19) and the recesses (21) in the first and the second profile (9, 11; 39, 41) have rounded corners with a radius of at least nearly 0.2 mm.

3. Window construction (1; 31) according to one of the preceding claims, **characterised in that** the joining piece (13; 43) is of a polyurethane moulding resin or a polyamide strip.

4. Window profile (5; 35) with a thermal break for application in the window construction (1; 31) according to one of the preceding claims, consisting of one piece comprising a first profile (9; 39), a second profile (11; 41) and an insulating joining piece (13; 43) situated between the first and the second profile (9, 11; 39, 41), where the first profile (9; 39) is provided with a means of attachment for fastening to a wall (3; 33), as well as a means for carrying a window (7; 55), **characterised in that** of the two profiles only the first profile (9; 39) is provided with the means of attachment for fastening to a wall (3; 33) and with the means for carrying a window (7; 55) and **in that** the first and second profile (9, 11; 39, 41) are separated by the joining piece (13; 43).

5. Window profile (5; 35) according to claim 4, **characterised in that** the joining piece (13; 43) has at least four dovetail-shaped projections (19) and the first and the second profile (9, 11; 39, 41) each have at least two congruent recesses (21) in which the joining piece's projections (19) are situated, and where the joining piece's projections (19) and the recesses (21) in the first and the second profile have rounded corners with a radius of at least nearly 0.2 mm.

6. Window profile (5; 35) according to claim 4 or 5, **characterised in that** the joining piece (13; 43) is of a polyurethane moulding resin or a polyamide strip.

Patentansprüche

1. Fensterkonstruktion (1; 31) mit unterbrochener Kältebrücke, die ein einteiliges Fensterprofil (5; 35) umfasst, bestehend aus einem ersten Profil (9; 39), das nach der Montage des Fensterprofils (5; 35) in einer Wand (3; 33) an der Wand befestigt ist, einem zweiten Profil (11; 41) sowie einem zwischen dem ersten und dem zweiten Profil vorhandenen, isolierenden Verbindungsteil (13; 47), wobei alle Profile und das Verbindungsteil während eines Herstellungsverfahrens miteinander verbunden werden, wobei die Fensterkonstruktion (1; 31) ferner ein Fenster (7; 55) umfasst, das von dem ersten Profil (9; 39) abgestützt wird, **dadurch gekennzeichnet,**

dass das Fenster (7; 55) allein von dem ersten Profil (9; 39) abgestützt wird und dass das erste und das zweite Profil (9, 11; 39, 41) durch das Verbindungsteil (13; 47) voneinander getrennt sind.

2. Fensterkonstruktion (1; 31) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Verbindungsteil (13; 47) mindestens vier schwalbenschwanzförmige Vorsprünge (19) aufweist und das erste und das zweite Profil (9, 11; 39, 41) jeweils mindestens zwei dazu passende Aussparungen (21) aufweisen, in denen sich die Vorsprünge (19) des Verbindungsteils befinden, wobei die Vorsprünge (19) des Verbindungsteils und die in dem ersten und dem zweiten Profil (9, 11; 39, 41) vorhandenen Aussparungen (21) mit gerundeten Ecken ausgeführt sind, deren Radius mindestens etwa 0,2 mm beträgt.

3. Fensterkonstruktion (1; 31) nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Verbindungsteil (13; 47) aus Polyurethan-Gießharz oder einem Polyamid-Flachprofil besteht.

4. Fensterprofil (5; 3 5) mit unterbrochener Kältebrükke für die Verwendung in der Fensterkonstruktion (1; 31) nach einem der vorangegangenen Ansprüche, das einteilig gefertigt ist und ein erstes Profil (9; 39), ein zweites Profil (11; 41) und ein zwischen dem ersten und dem zweiten Profil (9,11; 39, 41) vorhandenes, isolierendes Verbindungsteil (13; 47) umfasst, wobei dieses erste Profil (9; 39) mit Befestigungsmitteln für die Anbringung an einer Wand (3; 33) und mit Mitteln für die Abstützung eines Fensters (7; 55) versehen ist, **dadurch gekennzeichnet, dass** von den beiden Profilen lediglich das erste Profil (9; 39) mit Befestigungsmitteln für die Anbringung an einer Wand (3; 33) und mit Mitteln für die Abstützung eines Fensters (7;55) versehen ist und dass das erste und das zweite Profil (9, 11; 39, 41) durch das Verbindungsteil (13; 47) voneinander getrennt sind.

5. Fensterprofil (5; 35) nach Anspruch 4, **dadurch gekennzeichnet, dass** das Verbindungsteil (13; 47) mindestens vier schwalbenschwanzförmige Vorsprünge (19) aufweist und das erste und das zweite Profil (9, 11; 39, 41) jeweils mindestens zwei dazu passende Aussparungen (21) aufweisen, in denen sich die Vorsprünge (19) des Verbindungsteils befinden, wobei die Vorsprünge (19) des Verbindungsteils und die in dem ersten und dem zweiten Profil vorhandenen Aussparungen (21) mit abgerundeten Ecken ausgeführt sind, deren Radius mindestens etwa 0,2 mm beträgt.

6. Fensterprofil (5; 35) nach einem der Ansprüche 4 oder 5, **dadurch gekennzeichnet, dass** das Verbindungsteil (13; 47) aus Polyurethan-Gießharz oder einem Polyamid-Flachprofil besteht.

Revendications

1. Construction de fenêtre (1; 31) avec pont isolant discontinu contenant un profil de fenêtre (5; 35) composé d'une pièce comprenant un premier profil (9; 39) qui, après montage du profil de fenêtre (5; 35) dans un mur (3; 33), est fixé au mur, comprenant un deuxième profil (11; 41) et comprenant une pièce de jonction (13; 47) isolante présente entre le premier et le deuxième profil, où tous les profils ainsi que la pièce de jonction sont reliés entre eux au cours d'un processus industriel, laquelle construction de fenêtre (1; 31) contient en outre une fenêtre (7; 55) qui est portée par le premier profil (9; 39), **caractérisée en ce que** la fenêtre (7; 55) n'est portée que par le premier profil (9; 39) et **en ce que** le premier et le deuxième profil (9, 11; 39, 41) sont séparés par la pièce de jonction (13; 47).

2. Construction de fenêtre (1; 31) selon la revendication 1, **caractérisée en ce que** la pièce de jonction (13; 47) a au moins quatre saillies (19) en forme de queue d'aronde et **en ce que** le premier et le deuxième profil (9, 11; 39, 41) ont chacun au moins deux évidements (21) congruents dans lesquels se trouvent les saillies (19) de la pièce de jonction, où les saillies (19) de la pièce de jonction et les évidements (21) dans le premier et deuxième profil (9, 11; 39, 41) ont des coins arrondis avec un rayon d'au moins environ 0,2 mm.

3. Construction de fenêtre (1; 31) selon une des revendications précédentes, **caractérisée en ce que** la pièce de jonction (13; 47) est faite d'une résine polyuréthanne à couler ou d'une bande en polyamide.

4. Profil de fenêtre (5; 35) avec pont isolant discontinu pour utilisation dans la construction de fenêtre (1; 31) selon une des revendications précédentes, composé d'une pièce et contenant un premier profil (9; 39), un deuxième profil (11; 41) et une pièce de jonction (13; 47) isolante présente entre le premier et le deuxième profil (9, 11; 39, 41), lequel premier profil (9; 39) est pourvu de moyens de fixation pour la fixation à un mur (3; 33), ainsi que de moyens pour le port d'une fenêtre (7; 55), **caractérisé en ce que** des deux profils seul le premier profil (9; 39) est pourvu de moyens de fixation pour fixation à un mur (3; 33) et de moyens pour le port d'une fenêtre (7;55) et **en ce que** le premier et le deuxième profil (9, 11; 39, 41) sont séparés par la pièce de jonction (13; 47).

5. Profil de fenêtre (5; 35) selon la revendication 4, **caractérisé en ce que** la pièce de jonction (13; 47) a au moins quatre saillies (19) en forme de queue d'aronde et **en ce que** le premier et deuxième profil (9, 11; 39,41) ont chacun au moins deux évidements (21) congruents dans lesquels se trouvent les saillies (19) de la pièce de jonction, où les saillies (19) de la pièce de jonction et les évidements (21) dans le premier et deuxième profil ont des coins arrondis avec un rayon d'au moins environ 0,2 mm.

6. Profil de fenêtre (5; 35) selon la revendication 4 ou 5, **caractérisé en ce que** la pièce de jonction (13; 47) est faite d'une résine polyuréthanne à couler ou d'une bande en polyamide.

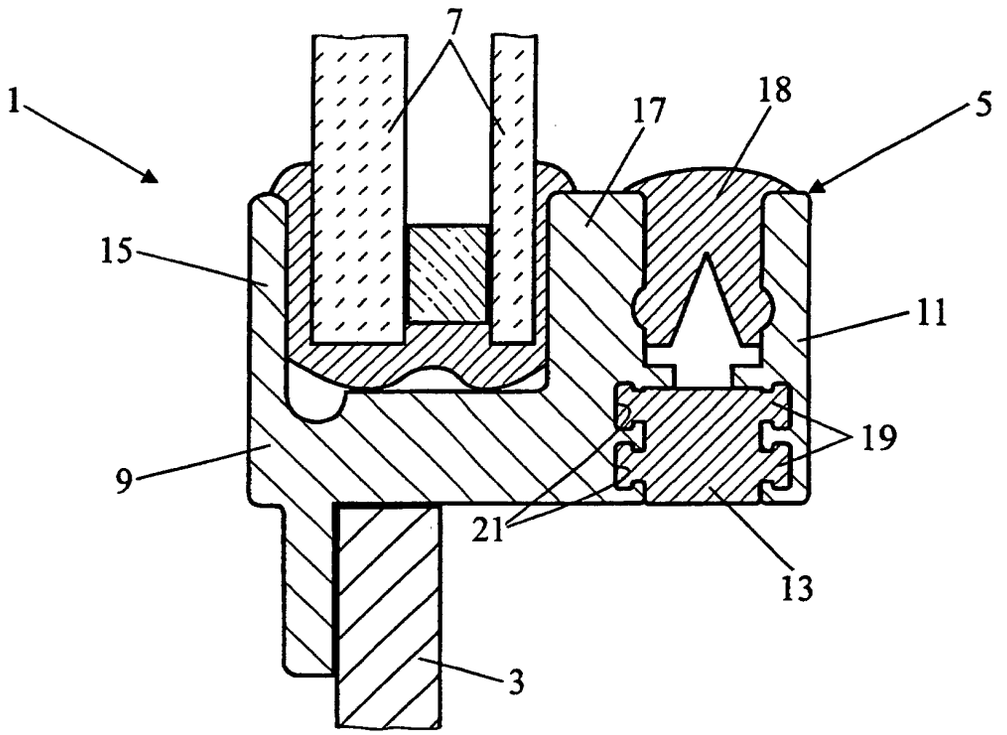

FIG. 1

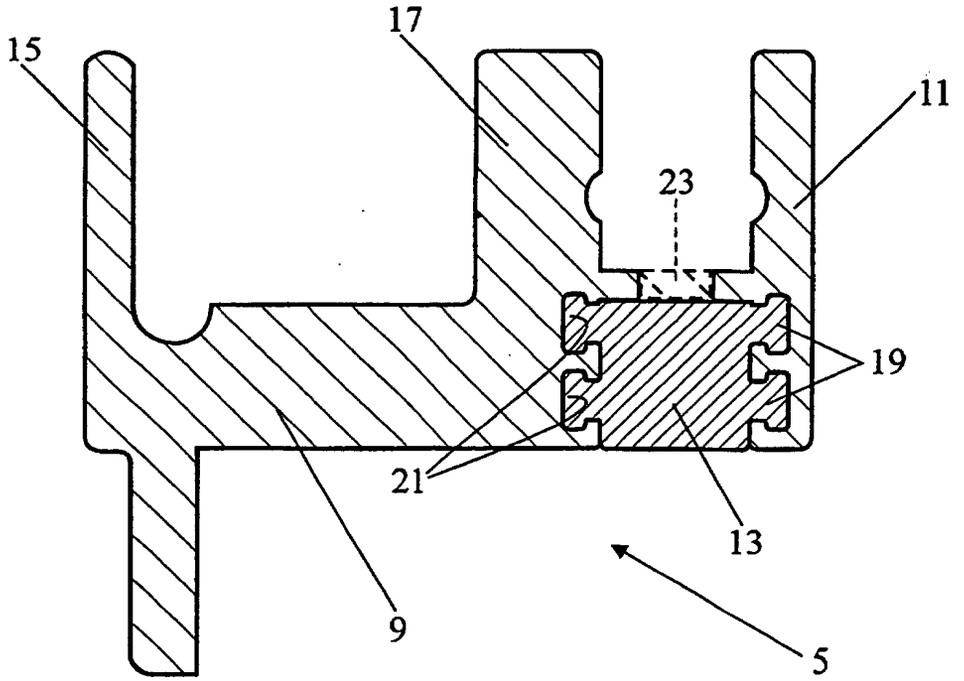

FIG. 2

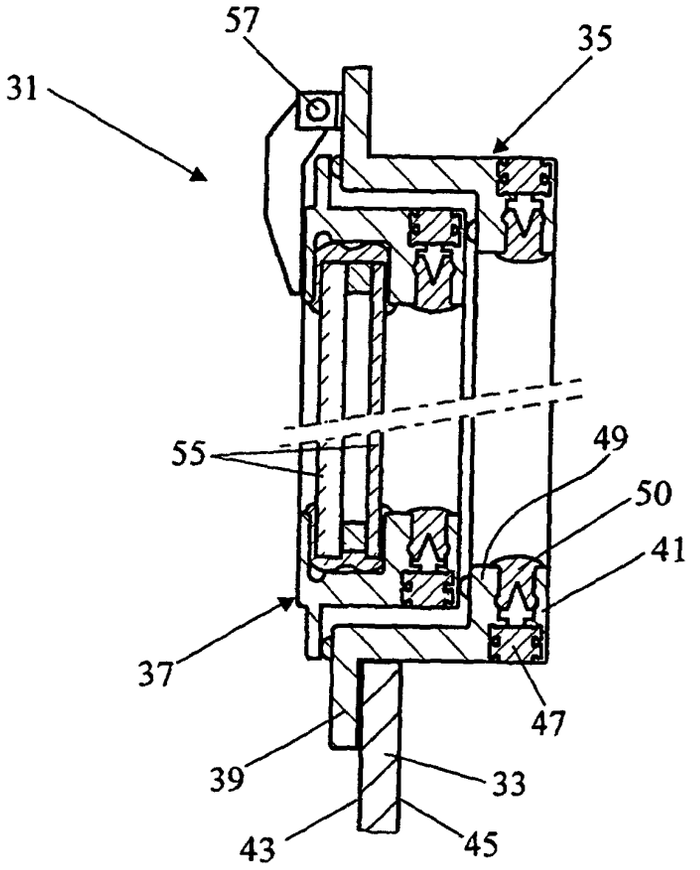

FIG. 3

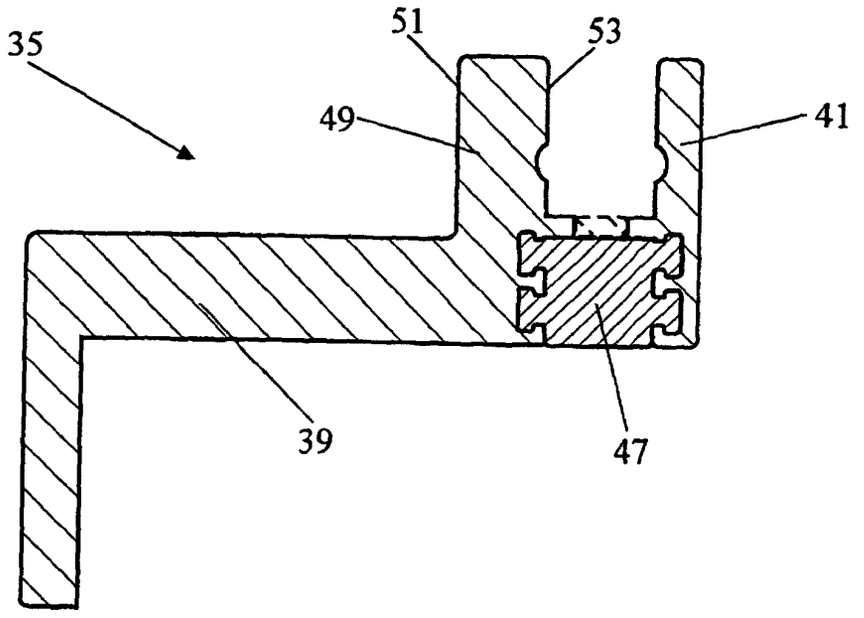

FIG. 4