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(54) **Spring clip for fastening a glass pane**

Federelement zur Befestigung einer Glasscheibe

Ressort de fixation de vitre

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EP 1 201 868 B1

Description

[0001] The present invention relates to a bearing section bar for a window frame and to a glass fastening element and a seal associated with said section bar.

[0002] In the field of frames for buildings, such as windows, doors and the like, the use of metal section bars is becoming increasingly widespread.

[0003] In the case of a window, said metal section bars are used to form a fixed frame and a movable frame which supports a glass pane.

[0004] Conventional internal frames for windows are formed by means of a bearing section bar and a glass-retaining section bar which are fastened to each other. Seals are positioned between the section bars and the glass, (see e.g. DE-A-4301395).

[0005] In some cases, the bearing section bar comprises an internal tubular part and an external tubular part provided with a respective abutment fin substantially parallel to sides of the glass. The internal tubular part has a C-shaped channel-like seat inside which the glass-retaining section bar is mounted. The glass-retaining section bar has a cross-section substantially in the shape of a "U" and is provided with a C-shaped channel-like seat which receives the seal engaged with the inner side of the glass. The abutment fin of the external tubular part is provided with another C-shaped channel-like seat which receives the seal engaged with the outer side of the glass. The abutment fin of the internal tubular part engages with the fixed frame.

[0006] In the frames made with these section bars, the glass-retaining section bar is located on the inside of the glass and the abutment fin of the external tubular part also performs the function of covering it, so much so that the abutment fin and the glass-retaining section bar have practically the same width.

[0007] In other cases, the bearing section bar comprises a tubular part and a longitudinal wall substantially parallel to one side of the glass and connected to the tubular part. The tubular part is provided with a C-shaped channel-like seat which receives the seal engaged with the inner side of the glass. The tubular part is also provided with an abutment fin substantially parallel to the sides of the glass and engaged with the fixed frame. The longitudinal wall is provided with a longitudinal cavity inside which a glass-retaining section bar having a cross-section substantially in the shape of an "I" or "L" is mounted. The glass-retaining section bar projects laterally from the longitudinal wall towards the glass and supports another seal engaged with the outer side of the glass.

[0008] In the frames made with these latter section bars, the glass-retaining section bar is located on the outside of the glass and, having a width practically equal to that of the tubular part of the bearing section bar, covers it.

[0009] In both cases, the presence of the glass-retaining section bar increases the dimensions of the internal frames of the doors or window frames in the plane of the glass and leaves free an opening for the glass, which has small dimensions. This opening assumes even smaller dimensions when a window with a metal frame is applied to a wooden framework of a pre-existing window. Therefore, the glazed area of the windows made with these frames is limited and penalizes the degree of illumination of the rooms.

[0010] This invention relates to a spring clip for fastening a glass pane to a section bar formed by a plate folded in the shape of an "L" and having a first and a second portion which are substantially perpendicular, said first portion of said plate being able to press against said outer side of said glass and said second portion of said "L" shaped plate being able to be inserted in a longitudinal cavity of said section bar, characterized in that said second portion of said "L" shaped plate is provided with inclined lateral fins which form an elastic support between said glass pane and said section bar.

[0011] Preferably, said second portion of said "L" shaped plate is provided with at least one tongue which can be inserted into a recess of said section bar.

[0012] Advantageously, said first portion of said "L" shaped plate is provided with a strip of resilient polymeric material able to make contact with said outer side of said glass.

[0013] Preferably, said first portion of said "L" shaped plate is provided with a hole designed to receive a tool for positioning said spring clip on said glass pane and inserting said second portion in said longitudinal cavity and said tongue in said recess.

[0014] The fastening spring clip of this invention, thanks to its lateral elastic fins, is highly capable of being deformed and elastically supporting the glass pane in respect of the bearing section bar. Thus, the fastening spring clips have the advantage of allowing to take up and correct possible clearances and tolerances of the dimensions and positioning of the glass pane.

[0015] The characteristic features and advantages of the invention will now be illustrated with reference to embodiments shown by way of a nonlimiting example in the accompanying drawings, in which:

Fig. 1 is a partial cross-sectional view of a window which incorporates a spring clip according to the invention;

Fig. 2 is a partial cross-sectional view of a window which incorporates a spring clip according to the invention;

Fig. 3 is a partial cross-sectional view of a central joint of a window of Fig. 1;

Fig. 4 is a partial cross-sectional view of a central joint of a window. of Fig. 2;

Fig. 5 is a partial cross-sectional view of a window made with a variant of the bearing section bar according to Fig. 1;

Fig. 6 is a partial cross-sectional view of a window made with a first variant of the bearing section bar according to Fig. 2;

Fig. 7 is a partial cross-sectional view of a central joint of a window made with the bearing section bar according to Fig. 5;

Fig. 8 is a partial cross-sectional view of a central joint of a window made with the bearing section bar according to Fig. 6;

Fig. 9 is a partial, vertically sectioned, view of a window made with the bearing section bar according to Fig. 1;

Fig. 10 shows a perspective view of a spring clip for fastening a glass pane, associated with the bearing section bars according to Figs. 1-9;

Figs. 11, 12 and 13 show, respectively, a rear view, a top view and a side view of the fastening spring clip according to Fig. 10;

Figs. 14 and 14a are a front view and a side view of an adhesive strip applied to the fastening spring clip according to Figs. 10-13;

[0016] Fig. 1 shows a window 1 with a movable wing, having a fixed frame 2, a movable frame 3, and a glass pane 4 of the double glazing type. The frame 2 comprises a thermally insulated section bar 5 having a configuration substantially in the shape of a "Z". The section bar 5 comprises, in turn, an internal metal section bar element 6, an external metal section bar element 7 and two insulating bars 8 which connect the internal and external metal section bar elements.

[0017] The metal section bar elements 6 and 7 are made, for example, of aluminium alloy and the insulating bars 8 are made of a suitable plastic material, for example, polyamide, if necessary reinforced with glass fibres.

[0018] The internal metal section bar element 6 comprises a tubular part 9 and an abutment fin 10. The tubular part 9 has a rectangular cross-section and has C-shaped channel-like seats 11, 12 and 13. The seats 11 house first ends of the insulating bars 8, the seat 12 houses a compensation (expansion) element 14 for the fastening to a wall and the seat 13 houses a component 15 of a hinge which connects the frames 2 and 3. The abutment fin 10 is provided with a C-shaped channel-like seat 16 for a seal.

[0019] Each insulating bar 8 is provided with a T-shaped tooth 17. A central seal 18, positioned between the two frames 2 and 3, is mounted on one tooth 17.

[0020] The external metal section bar element 7 comprises a tubular part 20 and an abutment fin 21. The tubular part 20 has a rectangular cross-section and has a pair of C-shaped channel-like seats 22 and a longitudinal channel 23. The seats 22 house second ends of the insulating bars 8.

[0021] The abutment fin 21 is provided with a C-shaped channel-like seat 24 for a seal.

[0022] The movable frame 3 comprises a bearing section bar 30 which, in turn, comprises two tubular parts 31 and 33, an abutment fin 32 and a longitudinal rib 34 which are formed as one piece.

[0023] The fin 32 is provided with a C-shaped channel-like seat 42 for a seal.

[0024] The tubular part 31 has a rectangular cross-section with a rounded edge and has a C-shaped channel-like seat 35, a C-shaped channel-like seat 36 and two longitudinal cavities 37 and 38. The seat 35 houses a component 39 of the hinge which connects together the frames 2 and 3. The seat 36 houses a shank 40a of a seal 40 which engages with an inner side 104 of the glass 4. The cavity 38 houses internally a spring clip 41 for fastening a glass pane, which secures the glass 4 to the bearing section bar 30 and will be described in detail further below.

[0025] The tubular part 33 has a rectangular cross-section, is positioned between the tubular part 31 and the longitudinal rib 34 and is integral with both of them.

[0026] The longitudinal rib 34 has a C-shaped channel-like seat 43, a recess 44 and a drainage hole 49. The channel-like seat 43 has an outwardly directed concavity and houses a shank 48 of a seal 45 which engages with an outer side 204 of the glass 4. The spring clip 41 engages with the recess 44, as will be described further below. The drainage hole 49 allows the discharging of water resulting from condensation and infiltration.

[0027] The seal 45 has a cross-section substantially in the shape of a "r"' and has two sealing lips 46 and 47. The lips 46 makes contact with the side 204 of the glass 4 and is located on the same side as the shank 48. In turn, the lip 47 makes contact with the fin 21 of the section bar element 7 and is located on the opposite side to the shank 48.

[0028] The seals 40 and 45 are made of elastomeric material.

[0029] The fastening spring clip 41 is formed by a plate 50 (Figs. 10-13) which is folded in the shape of an "L" and has two substantially perpendicular portions, 51 and 52. The portion 52 is provided with two fastening tongues 53 and two inclined lateral fins 54 which form an elastic support. The portion 51 is fitted with an adhesive strip 57 (Figs. 14 and 14a) of resilient polymeric material, such as foam-type rubber, which interposes between the spring clip 41 and the glass 4. The portion 51 of the plate 50 is provided with a hole 55 having dimensions able to receive a tool which allows positioning of the spring clip 41 between the glass 4 and the section bar 30, the portion 52 of the plate 50 being inserted into the longitudinal cavity 38 of the tubular part 3 and the tongues 53 into the recess 44 of the rib 34, while the portion 51, by means of the resilient strip 57, presses against the outer side 204 of the glass 4.

[0030] When determining the dimensions of the bearing section bar 30, the width of the tubular part 33 and the rib 34 are chosen so as to house glass 4 having a thickness which ranges from about 15 mm to about 25 mm in order to optimise the degree of thermal and acoustic insulation of the window 1.

[0031] In order to construct the window 1, the movable frame 3 is assembled and the glass 4 is mounted on the outer side of the frame 3, resting on the seal 40 supported

by the tubular part 31. Then, the glass 4 is secured to the frame 3 by means of a plurality of fastening spring clips 41 arranged along its perimeter. Each spring clip 41 is positioned on the glass 4 by means of tool, such as a screw driver, inserted into the hole 55 of the plate portion 51 and is then pushed towards the tubular part 31. In this way, the plate portion 52 penetrates into the longitudinal cavity 38 of the tubular part 31, the lateral fins 54 bear elastically against the tubular part 33, the tongues 53 are inserted into the recess 44 of the rib 34 and the plate portion 51 presses against the glass 4 by means of the resilient strip 57. Glass support elements, such as those indicated by 810 in Fig. 9, are positioned between the fastening spring clips 41. Then, the seal 45 is mounted in the channel-like seat 43 of the rib 34.

[0032] When the window 1 is complete, the outer edge of the glass 4 is covered only by the seal 45, while the spring clips 41 remain hidden below it. Thus a large glazed area is left free.

[0033] Fig. 2 shows a window 101 with a movable wing, in which parts identical to those of the window 1 in Fig. 1 are indicated by the same numbers. The window 101 has a movable frame 103 comprising a thermally insulated bearing section bar 130. The thermally insulated bearing section bar 130 comprises, in turn, a tubular part 131, an abutment fin 32, insulating bars 133 and a longitudinal rib 134.

[0034] The tubular part 131 has, in addition to the channel-like seat 36 and the longitudinal cavities 37 and 38, a pair of C-shaped channel-like seats 105 which house first ends of the insulating bars 133. The rib 34, in turn in addition to the channel-like seat 43 and the recess 44, has a foot 107 with a pair of C-shaped channel-like seats 108 inside which second ends of the insulating bars 133 are housed.

[0035] In the window 101 also, the glass 4 is secured to the bearing section bar 130 by means of fastening spring clips 41 and the glass support elements 810. The external edge of the glass 4 is covered only by the seal 45 which masks the spring clips and the glass support elements.

[0036] Fig. 3 shows a central joint 200 of a window 201 having an insert upright 202, a frame with a semi-fixed wing 203 and a movable frame 205. The upright 202 is fastened to the frame 203 by means of a screw 209. The frames 203 and 205 support a respective glass pane 4. The upright 202 comprises a thermally insulated section bar 210 which, in turn, comprises an internal metallic section bar element 206, an external metallic section bar element 207 and two insulating bars 208 which connect the internal and external metallic section bar elements. The central seal 18 is mounted on a T-shaped tooth 217 of an insulating bar 208.

[0037] Each of the frames 203 and 205 comprises a bearing section bar 30 the same as that shown in Fig. 1. Each bearing section bar 30 comprises the tubular parts 31 and 33 and the rib 34. A handle 211 is mounted in the frame 205.

[0038] Fig. 4 shows a central joint 300 of a window 301, in which parts the same as those of the central joint 200 in Fig. 3 are indicated by the same numbers. The central joint 300 has an insert upright 202, a frame with a semi-fixed wing 303 and a movable frame 305. Each of the frames 303 and 305 comprises a thermally insulated bearing section bar 130 which is the same as that shown in Fig. 2. Each bearing section bar 130 comprising the tubular part 130 identical to that shown in Fig. 2, each bearing section bar 130 comprising the tubular part 131, the insulating bars 133 and the rib 134.

[0039] Fig. 5 shows a window 401 with a movable wing, in which parts the same as those of the window 1 in Fig. 1 are indicated by the same numbers. The window 401 has the fixed frame 2 and a movable frame 403 comprising a bearing section bar 430. The bearing section bar 403 comprises, in turn, a tubular part 431, the tubular part 33 and the longitudinal rib 34, which are formed as one piece. The tubular part 431 has a cross-section formed by perpendicular rectangles with rounded edges and has a C-shaped channel-like seat 416 for a seal, the channel-like seat 36 and the longitudinal cavities 37 and 38. Components of a hinge 410 of the type suitable for wooden door and window framings are mounted in the frames 2 and 403.

[0040] Fig. 6 shows a window 501 with a movable wing, in which parts the same as those of the window 101 in Fig. 2 are indicated by the same numbers. The window 501 has the fixed frame 2 and a movable frame 503 comprising a thermally insulated bearing section bar 530. The bearing section bar 530 comprises, in turn, a tubular part 531, the insulating bars 133 and the longitudinal rib 134. The tubular part 531 has a cross-section formed by perpendicular rectangles with rounded edges and has the channel-shaped seat 36, the longitudinal cavities 37 and 38 and the pair of C-shaped channel-like seats 105 which house first ends of the insulating bars 133. The second ends of the insulating bars 133 are housed in the seats 108 of the foot 107 of the rib 134.

[0041] Fig. 7 shows a central joint 600 of a window 601, having an insert upright 202, a frame with a semi-fixed wing 603, and a movable frame 605. The upright 202 comprises a thermally insulated section bar 610 which, in turn, comprises an internal metallic section bar element 606, an external metallic section bar element 607 and two insulating bars 608 which connect the internal and external metal section bar elements. The central seal 18 is mounted on a T-shaped tooth 617 of an insulating bar 608. The frames 603 and 605 comprise a respective bearing section bar 430 the same as that shown in Fig. 5. Each bearing section bar 430 comprises the tubular part 431, tubular part 33 and longitudinal rib 34 which are formed as one piece.

[0042] Fig. 8 shows a central joint 700 of a window 701, in which parts the same as those of the central joint 600 in Fig. 7 are indicated by the same numbers. The central joint 700 has an insert upright 602, a frame with a semi-fixed wing 703, and a movable frame 705. The

frames 703 and 705 comprise a respective thermally insulated bearing section bar 530 the same as that shown in that Fig. 6. Each bearing section bar 530 comprises the tubular part 531, the insulating bars 133 and the longitudinal rib 134.

[0043] Fig. 9 shows a vertical joint of a window made with the bearing section bar 30 in Fig. 1. The window 800 has a fixed frame 802 and a movable frame 803. The frame 802 comprises a thermally insulated section bar 805 which, in turn, comprises an internal metallic section bar element 806, an external metallic section bar element 807 and two insulating bars 808 which connect the internal and external metallic section bar elements. An insulating element 809 which is fastened to a wall 812 is mounted in the section bar element 806.

[0044] The frame 803 comprises the bearing section bar 30 which, in turn, comprises the two tubular parts 31 and 33, the abutment fin 32 and the longitudinal rib 34 formed as one piece. Glass support elements 810 are positioned between the bearing section bar 30 and the glass 4 in the spaces between the fastening spring clips 41, shown in Figs. 1-8. Each glass support element 810 has a wedge shape and is provided with a foot 811 which is inserted inside the cavity 37.

Claims

1. Spring clip (41) for fastening a glass pane (4) to a section bar (30, 130; 430; 530; 930) formed by a plate (50) folded in the shape of an "L" and having a first and a second portion (51, 52) which are substantially perpendicular, said first portion (51) of said plate being able to press against said outer side (204) of said glass (4) and said second portion (52) of said "L" shaped plate (50) being able to be inserted in a longitudinal cavity (38) of said section bar (30; 130; 430; 530; 930), **characterized in that** said second portion (52) of said "L" shaped plate (50) is provided with inclined lateral fins (54) which form an elastic support between said glass pane (4) and said section bar (30, 130; 430; 530; 930).

2. Spring clip (41) according to Claim 1, **characterized in that** said second portion (52) of said "L" shaped plate (50) is provided with at least one tongue (53) which can be inserted into a recess (44) of said section bar (30; 130; 430; 530; 930).

3. Spring clip (41) according to Claim 1 **characterized in that** said first portion (51) of said "L" shaped plate (50) is provided with a strip (57) of resilient polymeric material able to make contact with said outer side (204) of said glass (4).

4. Spring clip (41) according to Claims 1 and 2; **characterized in that** said first portion (51) of said "L" shaped plate (50) is provided with a hole (55) designed to receive a tool for positioning said spring clip (41) on said glass pane (4) and inserting said second portion (52) in said longitudinal cavity (38) and said tongue (53) in said recess (44).

Patentansprüche

1. Federclip (41) zum Befestigen einer Glasscheibe (4) an einer Profilleiste (30, 130, 430, 530, 930), welcher durch eine Platte (50) ausgebildet ist, die in der Form eines "L" gefaltet ist und einen ersten und einen zweiten Bereich (51, 52) aufweist; die im Wesentlichen rechtwinkelig sind, wobei der erste Bereich (51) der Platte imstande ist, gegen die äußere Seite (204) des Glases (4) anzudrücken und der zweite Bereich (52) der "L"-geformten Platte (50) imstande ist, in einen longitudinalen Hohlraum (38) der Profilleiste (30, 130, 430, 530, 930) eingeführt zu werden, **dadurch gekennzeichnet,**
dass der zweite Bereich (52) der "L"-geformten Platte (50) mit geneigten seitlichen Finnen (54) versehen ist, die eine elastische Aufnahme zwischen der Glasscheibe (4) und der Profilleiste (30, 130, 430, 530, 930) bilden.

2. Federclip (41) nach Anspruch 1,
dadurch gekennzeichnet,
dass der zweite Bereich (52) der "L"-geformten Platte (50) mit mindestens einer Zunge (53) versehen ist, die in eine Ausnehmung (44) der Profilleiste (30, 130, 430, 530, 930) eingeführt werden kann

3. Federclip (41) nach Anspruch 1,
dadurch gekennzeichnet,
dass der erste Bereich (51) der "L"-geformten Platte (50) mit einem Streifen (57) eines nachgiebigen polymerischen Materials versehen ist, mit welchem ein Kontakt mit der äußeren Seite (204) des Glases (4) herstellbar ist.

4. Federclip (41) nach Ansprüchen 1 und 2,
dadurch gekennzeichnet,
dass der erste Bereich (51) der "L"-geformten Platte (50) mit einem Loch (55) versehen ist, welches ausgebildet ist, um ein Werkzeug zur Positionierung des Federclips (41) an der Glasscheibe (4) sowie zum Einführen des zweiten Bereichs (52) in den longitudinalen Hohlraum (38) und der Zunge (53) in die Ausnehmung (44) aufzunehmen.

Revendications

1. Pince à ressort (41) pour fixer une vitre (4) sur une barre transversale (30 ; 130 ; 430 ; 530 ; 930) formée par une plaque (50) pliée sous la forme d'un « L » et ayant une première et une seconde partie (51, 52)

qui sont sensiblement perpendiculaires, ladite première partie (51) de ladite plaque pouvant être comprimée contre ledit côté externe (204) de ladite vitre (4) et ladite seconde partie (52) de ladite plaque en forme de « L » (50) pouvant être insérée dans une cavité longitudinale (38) de ladite barre transversale (30 ; 130 ; 430 ; 530 ; 930), **caractérisée en ce que** ladite seconde partie (52) de ladite plaque en forme de « L » (50) est dotée d'ailettes latérales inclinées (54) qui forment un support élastique entre ladite vitre (4) et ladite barre transversale (30 ; 130 ; 430 ; 530 ; 930).

2. Pince à ressort (41) selon la revendication 1, **caractérisée en ce que** ladite seconde partie (52) de ladite plaque en forme de « L » (50) est prévue avec au moins une languette (53) qui peut être insérée dans un évidement (44) de ladite barre transversale (30 ; 130 ; 430 ; 530 ; 930).

3. Pince à ressort (41) selon la revendication 1, **caractérisée en ce que** ladite première partie (51) de ladite plaque en forme de « L » (50) est dotée d'une bande (57) de matériau polymère élastique pouvant établir le contact avec ledit côté externe (204) de ladite vitre (4).

4. Pince à ressort (41) selon les revendications 1 et 2, **caractérisée en ce que** ladite première partie (51) de ladite plaque en forme de « L » (50) est prévue avec un trou (55) conçu pour recevoir un outil afin de positionner ladite pince à ressort (41) sur ladite vitre (4) et insérer ladite seconde partie (52) dans ladite cavité longitudinale (38) et ladite languette (53) dans ledit évidement (44).

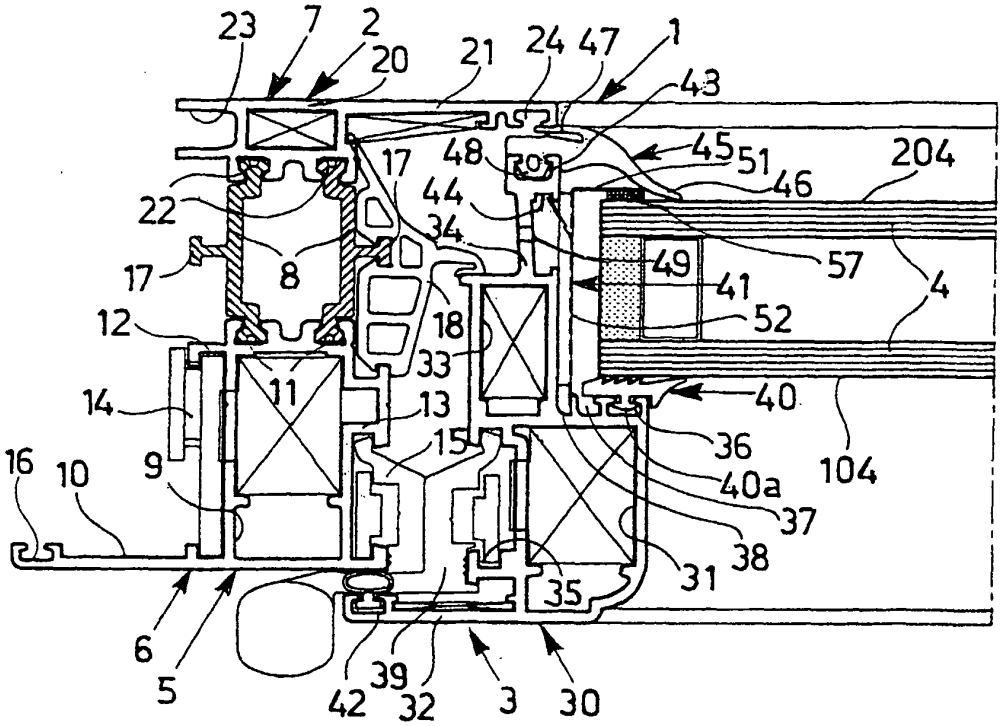

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Fig.1

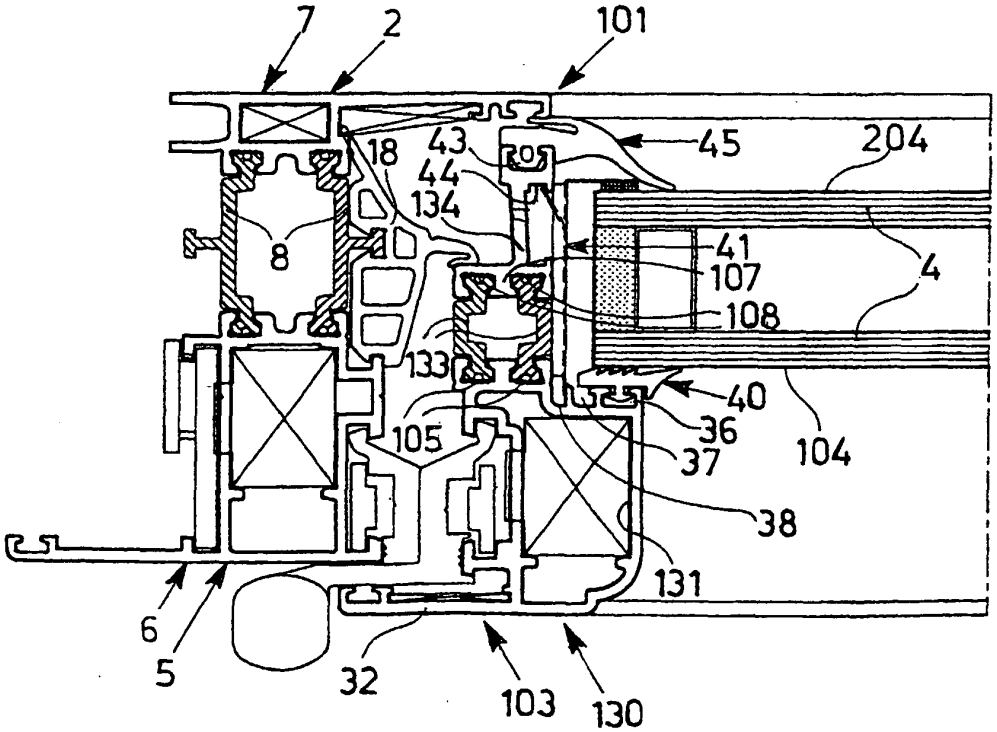

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Fig.2

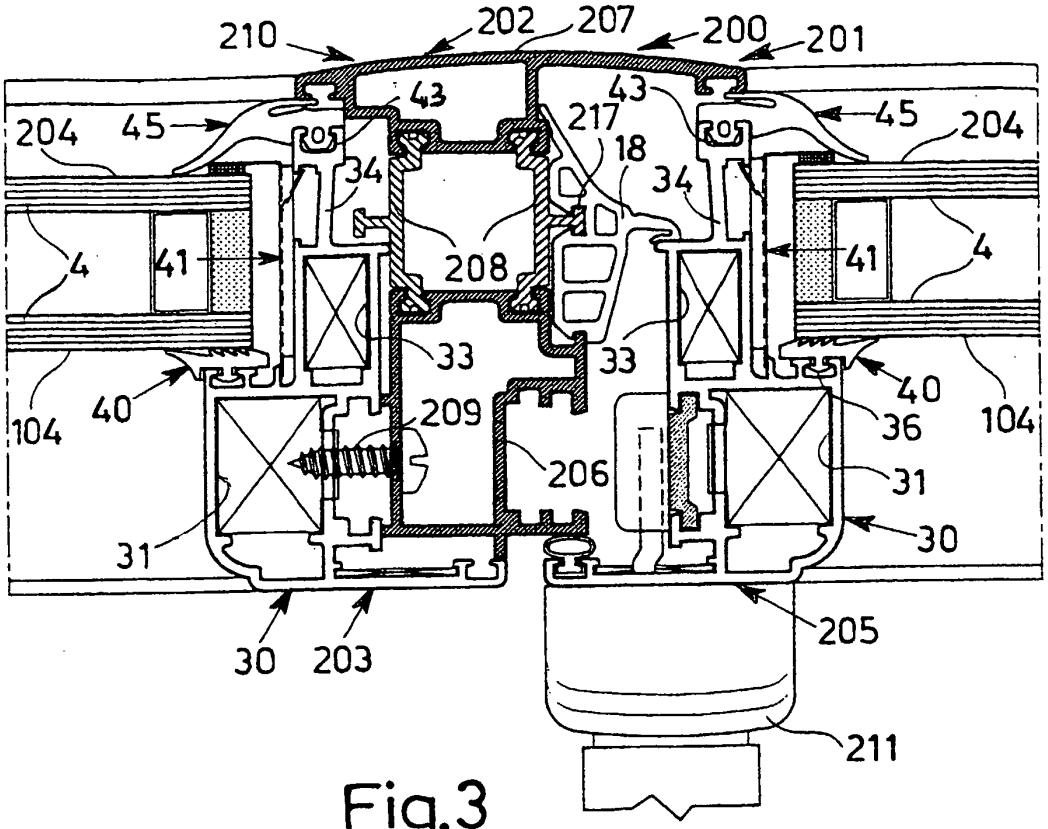

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Fig.3

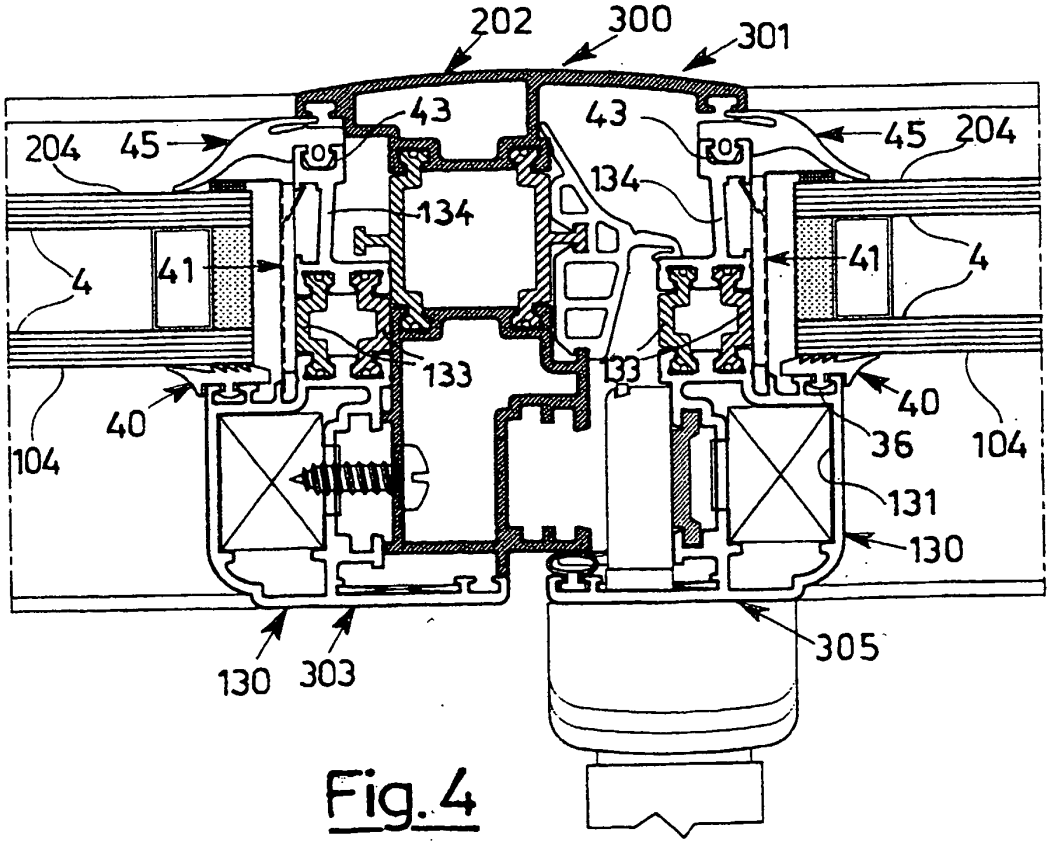

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Fig.4

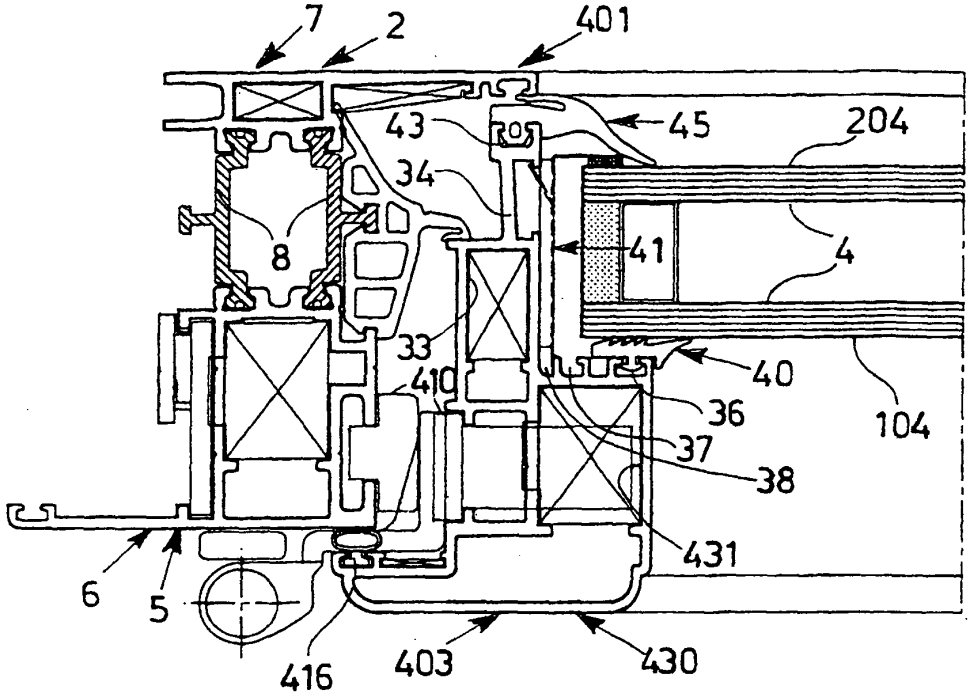

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Fig. 5

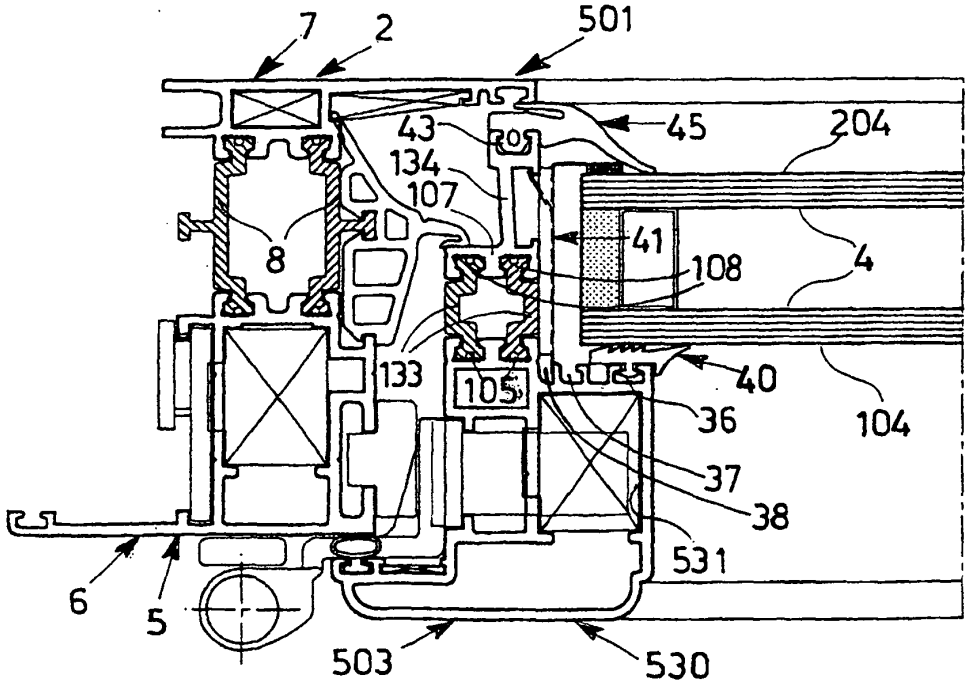

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Fig. 6

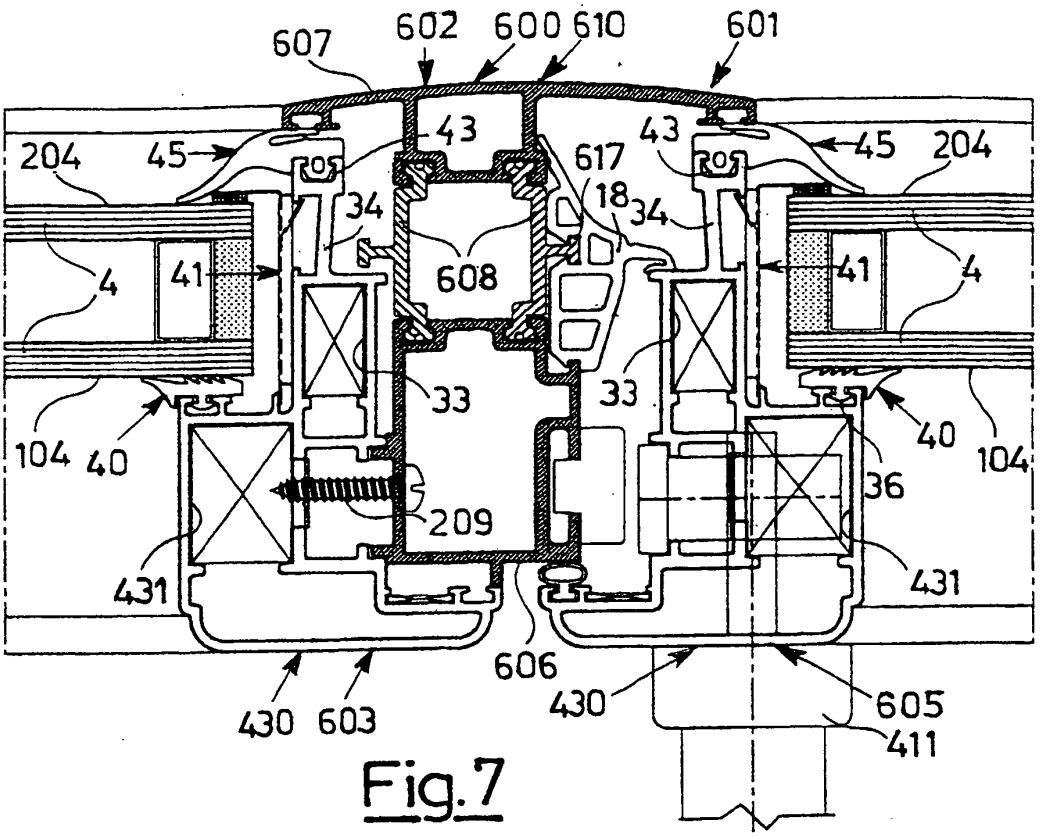

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Fig.7

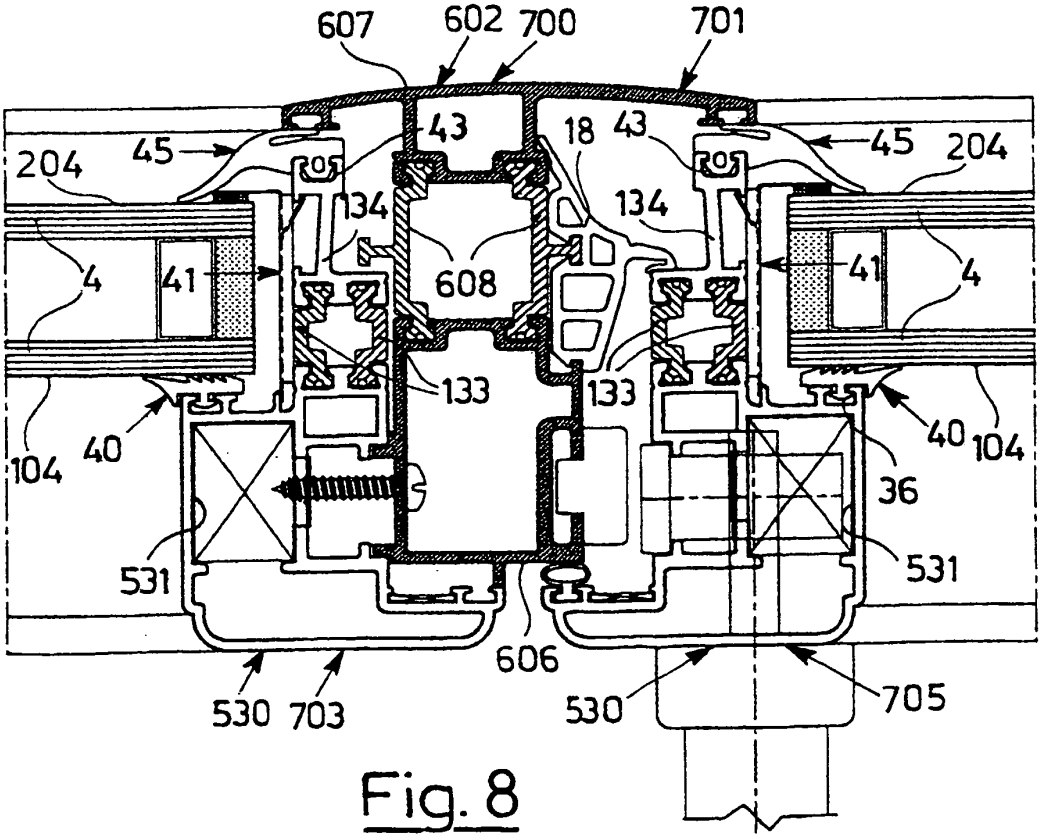

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701
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134
608
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4
133
104
40
531
606
530
703
705
36

Fig.8

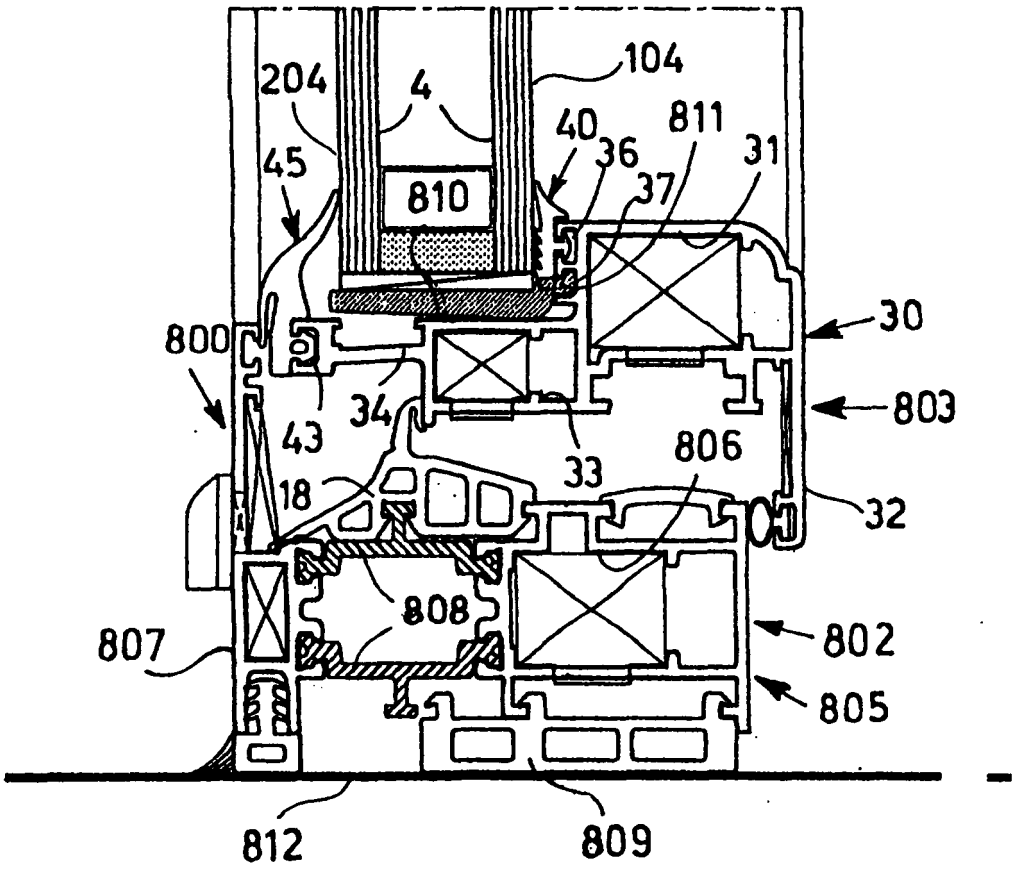

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811
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812
809

Fig. 9

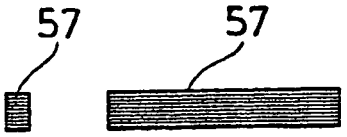


Fig.14a Fig.14

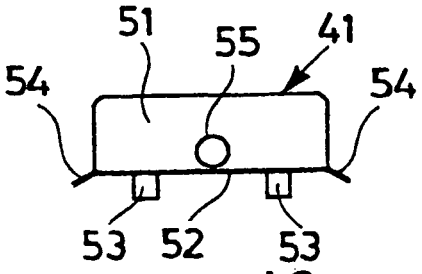


Fig.12

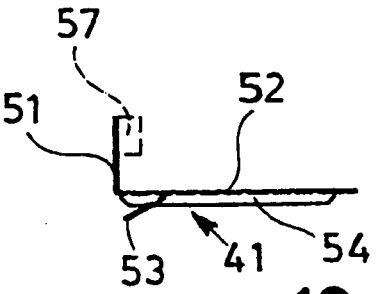


Fig.13

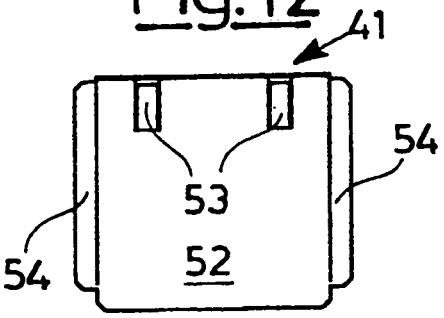


Fig.11

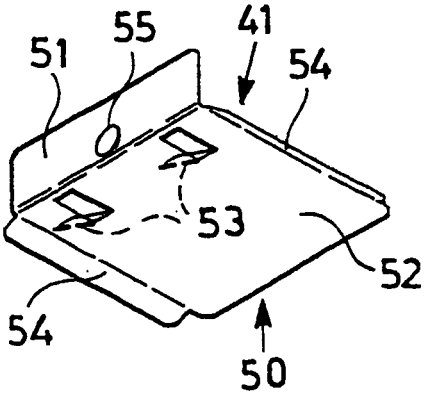


Fig.10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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