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(54) Grate

(57) Ventilation grate comprising two elongated trough-shaped members onto which supporting members for fins are mounted, whereby a fin is supported by a supporting member of a first trough-shaped member and by a supporting member of the second trough-shaped member, characterised in that the trough-shaped members am provided with two arms with a wing, whereby the wings are substantially directed towards each other and whereby the wings have free extremities which are separated from each other, and characterised in that the supporting member is made from plastic material and has two slots, whereby the wing of a first arm of a trough-shaped member is inserted into a first slot, while the wing of the second arm of this trough-shaped member is inserted into the second slot, so that the supporting member slides into the trough-shaped member, and so that the pivoting of the supporting member with respect to the trough-shaped member is avoided.

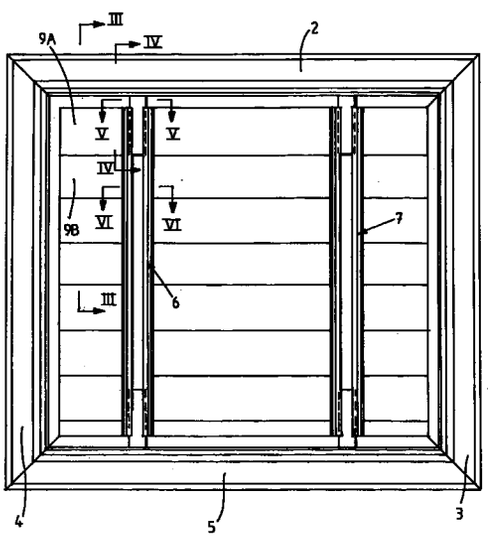

Fig. 2

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Description

[0001] The invention relates to a ventilation grate, which is provided with special supporting members for the fins.

[0002] A ventilation grate with supporting members for the fins is described in NL-A-79 02263. The supporting members made from aluminium are attached to a carrier, by inserting two nails of each supporting member in the openings of the carrier.

[0003] Disadvantages of this ventilation grate are among others:

- the supporting members and the fins are made from aluminium, by which the heat flow between the fins and the bearer is not prevented,
- the fins touch the bearer,
- the nails of the supporting member serve to attach the supporting member onto the bearer. Such nails are no good means to avoid or prevent the pivoting of the supporting member with respect to the bearer,
- the positioning of the supporting members one on top of the other depends on the holes of the bearer in which the nails of the supporting member are inserted,
- in case of expansion of the supporting member with respect to the bearer, the nails are subjected to a shearing force.

[0004] The ventilation grate according to the invention is a grate that allows to avoid these disadvantages.

[0005] The ventilation grate comprises at least two elongated trough-shaped members onto which supporting members for fins are mounted, whereby a fin is supported by a supporting member of the first trough-shaped member and by a supporting member of the second trough-shaped member. The trough-shaped members are provided with two arms with a wing, whereby the wings are substantially directed to each other and whereby the wings have free ends which are separated from each other.

[0006] The supporting member is made of plastic material and has two slots, whereby the wing of a first arm of a trough-shaped member is inserted in a first slot, while the wing of the second arm of this trough-shaped member is inserted in the second slot, so that the supporting member slides or can slide into the trough-shaped member and so that the pivoting of the supporting member with respect to the trough-shaped member is avoided.

[0007] Preferably, the supporting member has a part that slides into the trough-shaped member, whereby this part has a bottom and a top surface. This part bears a first and a second leg between which a fin partially extends, whereby these legs extend outside the trough-shaped member.

[0008] For two supporting members placed on top of each other, the top surface of the part of a first supporting member and the first leg of this first supporting member touch the bottom surface of the part of the second supporting member and the second leg of the second supporting member.

[0009] Better still, for two supporting members placed on top of each other, the top surface of the part of the lower supporting member and the first leg of this lower supporting member touch the bottom surface of the part of the upper supporting member and the second leg of this upper supporting member.

[0010] According to an embodiment, the first leg has a side surface that is directed towards the trough-shaped member and that extends at least partially in the extension of the surface of the slot that is situated outside the trough-shaped member, whereby this side surface at least partially touches the wings of the trough-shaped member.

[0011] According to a characteristic of a preferred embodiment, the first and second leg of a supporting member am substantially perpendicular and held together by a strengthening plate.

[0012] According to a detail of an embodiment, the first leg bears a piece that is provided with a slot in which an edge of a fin is partially inserted, while the second leg is preferably provided with a clamping system in which a protrusion of a fin is inserted.

[0013] The invention also relates to a supporting member and a fin for a grate, as defined in the claims.

[0014] Characteristics and details of an embodiment according to the invention will become apparent from the following description, in which reference is made to the attached drawings.

[0015] In these drawings, it is shown

In Figure 1: a front view of a ventilation grate;
In Figure 2: a partial back view of the grate of figure 1;
In Figure 3: a cross section along line III-III;
In Figure 4: a cross section along line IV-IV;
In Figure 5: a cross section along line V-V;
In Figure 6: a cross section along line VI-VI;
In Figure 7: a perspective view of a supporting member;
In Figure 8: a large-scale side view of the supporting member;
In Figure 9: a large-scale side view of a fin;
In Figure 10: a side view of the fin of figure 9 on the supporting member of figure 8;
In Figure 11: a partial perspective side view of a frame with a supporting member;
In Figure 12: a cross section along line XI-XI of the frame of figure 11;
In Figure 13: a cross section along line III-III, but only the plastic parts and the fin;
In Figure 14: a lace-scale side view of the one-piece supporting member and the four-piece supporting member;

In Figure 15: a large-scale side view whereby the one-piece supporting member and the four-piece supporting member are fitted into each other.

[0016] The grate 1 comprises:

- four profiles 2, 3, 4, 5 which form a frame;
- two elongated trough-shaped members 6, 7 which extend between the profiles 2 and 5;
- a series of supporting members 8A, 8B, 8C, ... which are placed onto the trough-shaped members 6, 7, and
- a series of fins 9A, 9B each of which is supported by a supporting member of the trough-shaped member 6 and by a supporting member of the trough-shaped member 7.

[0017] Each trough-shaped member 6, 7 consists of an aluminium profile that has two opposite channels C1, C2. In the extremities of the first channel C1 are inserted two parts 10, which are screwed onto the profiles 2, 5.

[0018] The second channel C2 is defined between the arms 11, 12 with wings 13, 14. The free ends of the wings are directed to each other and separated from each other.

[0019] The supporting member 8A is made from plastic material and has two opposite slots 15, 16, whereby the wing 13 of a first arm 11 of a trough-shaped member is inserted into a first slot 15, while the wing 14 of the second arm 12 of this trough-shaped member is inserted into the second slot 16, so that the supporting member 8A slides or can slide into the trough-shaped member (arrow X) and so that the pivoting of the supporting member 8A with respect to the trough-shaped member is avoided.

[0020] The supporting member has a base part 17 that is situated in the channel C2 and that extends between a bottom surface O1 and atop surface B1. The part 17 bears a leg 18 that is situated outside the channel C2 and that with part 17 defines the slots 15 and 16, and a leg 19 which is perdendicular to the leg 18.

[0021] At the bottom, the part 17 is provided with a slot 22 which is directed to the outside with respect to the channel C2.

[0022] The leg 18 is provided with a protrusion 20, which is situated above the top surface B1, and which is directed towards the trough-shaped member 6, 7.

[0023] For two supporting members 8A, 8B placed on top of each other, the upper surface B1 and the leg 17 of the lower supporting member 8B, touch respectively the bottom surface O1 and the leg 19 of the upper supporting member 8A.

[0024] If the top surface B1 of the lower supporting member 8B touches the bottom surface O1 of the upper supporting member 8A, the protrusion 20 of the upper supporting member 8A is inserted into the slot 22 of the lower supporting member 8B, so that the supporting members are connected to each other and form a whole. By mounting fin 9B in slot 27, the protrusion 20 is pushed into the slot 22 and the two supporting members 8A and 8B are indissolubly connected to each other. This is made clear by the figures 13, 14 and 15.

[0025] The leg 18 has a side surface 23 that is directed towards the channel C2 and that touches the wings 13, 14.

[0026] A plate 25 which is perdendicular to the legs 18 and 19, connects these legs as a strengthening means.

[0027] The leg 18 bears at its free extremity a head 26 with a slot 27, while the leg 19 is provided at its free extremity with a clamping system. This clamping system consists of two teeth 28A, 28B between which a substantially cylindrical slot 29 is formed.

[0028] The fin 9A, 9B has a free extremity 30 that is inserted in the slot 27 of the leg 18 of a supporting member.

[0029] The fin 9 also bears an element 31 that intermates with the clamping system 28 of the leg 19 to attach the fin onto the supporting member 8.

[0030] The element 31 consists of an arm 32 which bears a substantially cylindrical or U-shaped head 33. This head 33 is inserted into the slot 29 of the clamping system for attaching the fin.

[0031] For small grates, the two elongated trough-shaped members are parts of two opposite profiles of the frame (see figures 11 and 12).

[0032] According to an embodiment, the profiles 2, 3, 4, 5 and the trough-shaped members 6, 7 are made from aluminium, while the supporting members 8A, 8B, 8C are made from plastic material (e.g. PVC). According to another embodiment, the profiles, the trough-shaped members and the supporting members are made from plastic material (e.g. PVC).

[0033] Figures 8 through 10 show an advantageous embodiment of a supporting member and of a fin.

[0034] The supporting member 8 is similar to the supporting member that is shown in figure 7, except that the clamping system with teeth 28A, 28B is different. Between the teeth 28A, 28B a substantially cylindrical slot 29 with a recess 40 is formed. This recess 40 is defined between two surfaces V1, V2, between which an angle γ of 30 to 60°, preferably of about 45° is situated. This angle γ is preferably selected such that the point of contact R of the fin on the leg 18 is situated in the plane of the surface V1.

[0035] The fin 9 bears a U-shaped head 33 which is attached onto the arm 32. This head 33 consists of an upwards turned wing 33A and a downwards turned wing 33B which is provided with a triangular (in cross section) protrusion 33C. This protrusion 33C is intented for insertion into the recess 40.

[0036] The fin 9 comprises a flat upper part 90 that is intended for resting onto the leg 18, a flat lower part 92, and a flat intermediate part 91 that is between the upper part and the lower part.

[0037] The tangent line 93 between the parts 90 and

91 is located in the plane W, in which a surface 33C1 of the protrusion 33C is located.

[0038] After clamping the head 33 into the clamping system (28A, 28B), a screw 100 can be screwed between the wings 33A, 33B, so that an extra support or attachment of the fin 9 on the supporting member 8 is realised, and/or so that apart from the supporting member 8, also the frame is attached with this screw.

Claims

1. Ventilation grate comprising two elongated trough-shaped members onto which supporting members for fins are mounted, whereby a fin is supported by a supporting member of a first trough-shaped member and by a supporting member of the second trough-shaped member, characterised in that the trough-shaped members are provided with two arms with a wing, whereby the wings are substantially directed to each other and whereby the wings have free ends which are separated from each other, and characterised in that the supporting member is made from plastic material and has two slots, whereby the wing of a first arm of a trough-shaped member is inserted in a first slot, while the wing of the second arm of this trough-shaped member is inserted into the second slot, so that the supporting member slides into the trough-shaped member and so that the pivoting of the supporting member with respect to the trough-shaped member is avoided.

2. Ventilation grate according to claim 1, characterised in that the supporting member has a part that slides into the trough-shaped member, whereby this part has a bottom surface and a top surface
that this part bears a first and a second leg, between which a fin partially extends, whereby these legs extend outside the trough-shaped member, and
that, for two supporting members placed on top of each other, the top surface of the part and the first leg of a first supporting member touch the bottom surface of the part and the second leg of the second supporting member.

3. Ventilation grate according to claim 2, characterised in that, for two supporting members placed on top of each other, the top surface of the part of the lower supporting member and the first leg of this lower supporting member touch the bottom surface of the part of the upper supporting member and the second leg of this upper supporting member.

4. Ventilation grate according to claim 3, characterised in that the first leg has a side surface that is directed towards the trough-shaped member and that is at least partially located in the extension of the surface of the slot which is situated outside the trough-shaped member, whereby this side surface at least partially touches the wings of the trough-shaped member.

5. Ventilation grate according to any one of claims 2 through 4, characterised in that the first and the second legs of a supporting member are substantially perpendicular and are connected to each other by a strengthening plate.

6. Ventilation grate according to any one of claims 2 through 5, characterised in that the first leg bears a piece that is provided with a slot in which an edge of a fin is partially inserted.

7. Ventilation grate according to claim 6, characterised in that the second leg is provided with a clamping system into which a protrusion of a fin is inserted.

8. Ventilation grate according to any one of the preceding claims, characterised in that the supporting members are provided with a connecting element, whereby two supporting members placed on top of each other are interconnected by this connecting element.

9. Ventilation grate according to claim 1, characterised in that this grate comprises a frame which is formed by profiles, whereby the trough-shaped members are parts of two profiles of the frame.

10. Ventilation grate according to claim 7, characterised in that the clamping system consists of two teeth between which a substantially cylindrical slot is formed, and that the protrusion of the fin consists of an arm that bears two wings.

11. Ventilation grate according to claim 10, characterised in that the slot of the clamping system is provided with a recess, and that a wing is provided with a protrusion which is intended for insertion into the recess.

12. Supporting member for a fin of a ventilation grate, characterised in that the supporting member has a part that is intended to slide into a trough-shaped member, whereby this part has a bottom surface and a top surface;
that this part bears a first and a second leg, between which a fin partially extends, whereby these legs extend outside the trough-shaped member, and
that, for two supporting members placed on top of each other, the top surface of the part and the first leg of a first supporting member touch the bottom surface of the part and the second leg of the sec-

ond supporting member.

13. Supporting member according to claim 12, characterised in that, for two supporting members placed on top of each other, the top surface of the part of the lower supporting member and the first leg of this lower supporting member, touch the bottom surface of the part of the upper supporting member and the second leg of this upper supporting member.

14. Supporting member according to claim 13, characterised in that the first leg has a side surface that is directed towards the trough-shaped member and that at least partially lies in the extension of the surface of the slot that is situated outside the trough-shaped member, whereby this side surface at least partially touches the wings of the trough-shaped member.

15. Supporting member according to any one of claims 12 through 14, characterised in that the first and the second legs of a supporting member are substantially perpendicular and are connected by a strengthening plate.

16. Supporting member according to any one of claims 12 through 15, characterised in that the first leg bears a piece that is provided with a slot in which an edge of a fin is partially inserted.

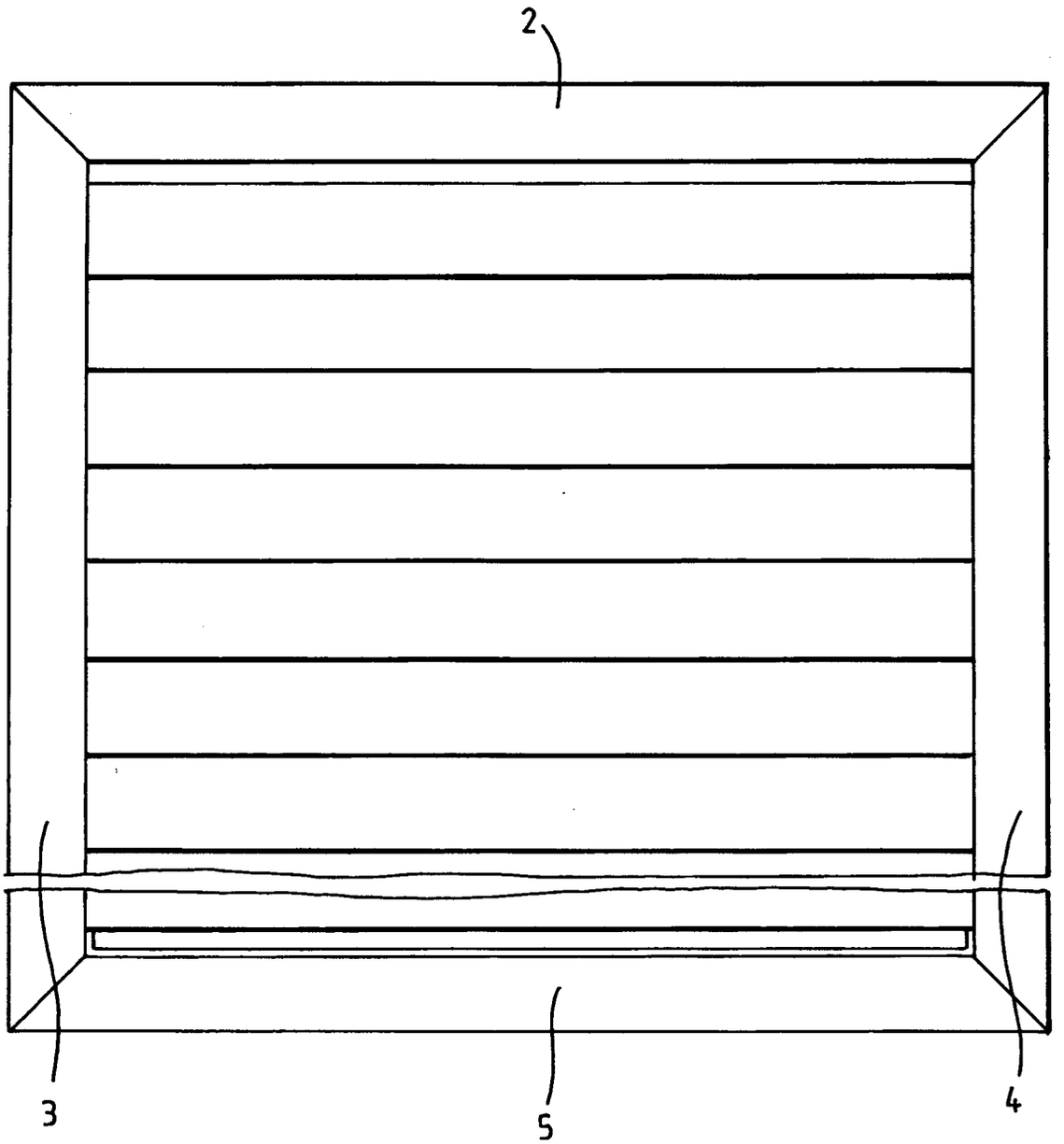
17. Supporting member according to claim 16, characterised in that the second leg is proviced with a clamping system, in which a protrusion of a fin is inserted.

18. Supporting member according to claim 17, characterised in that the clamping system consists of two teeth, between which a substantially cylindrical slot is formed.

19. Supporting member according to claim 18, characterised in that the slot of the clamping system is provided with a recess and in which a protrusion of a fin can be inserted.

20. Fin intended to be attached onto a supporting member according to claim 18 or 19, whereby the protrusion of the fin consists of an arm that bears two wings, and whereby a wing is provided with a protrusion and that is intended to be inserted into the recess of the supporting member.

Fig. 1



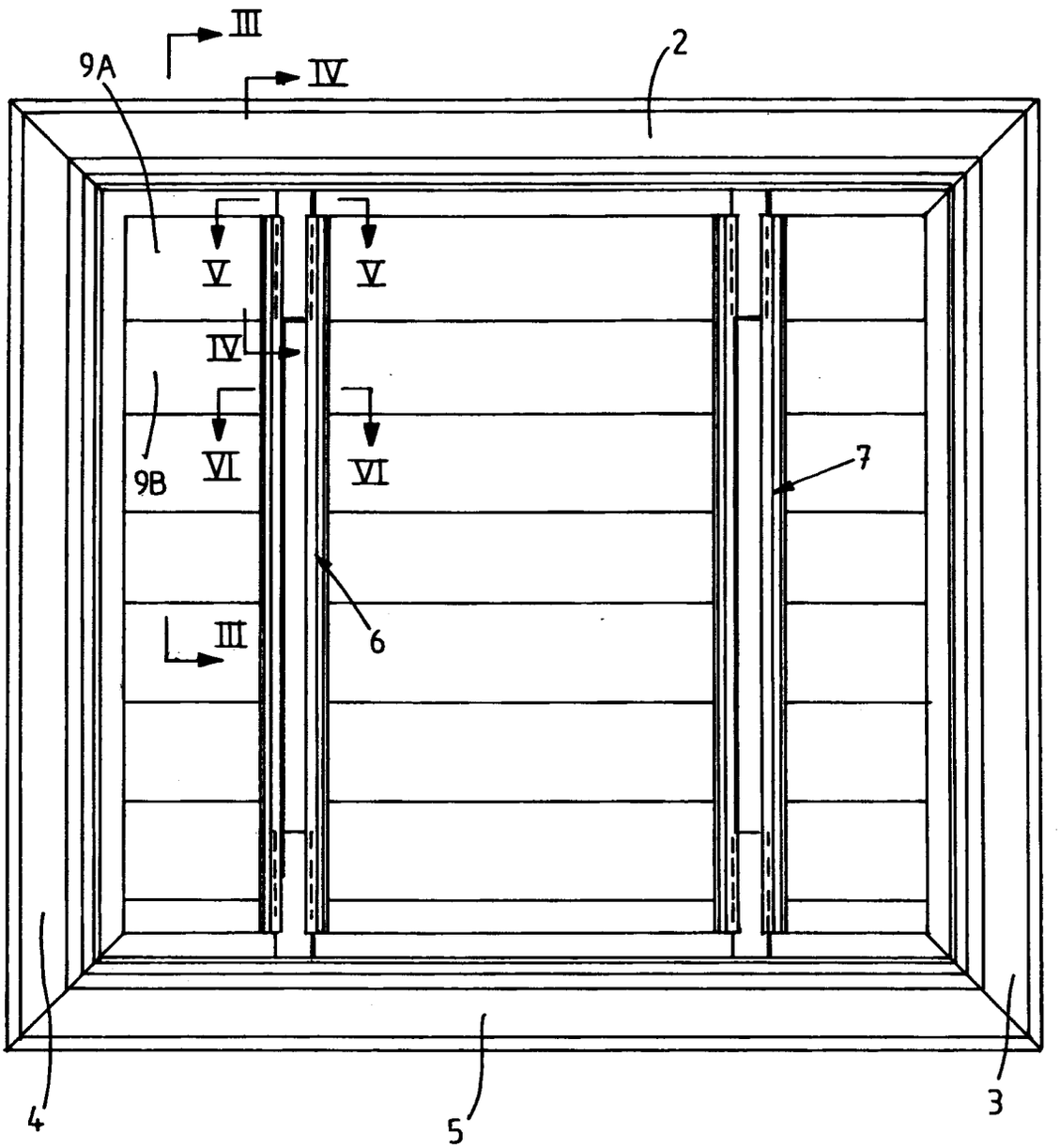


Fig. 2

Fig. 3

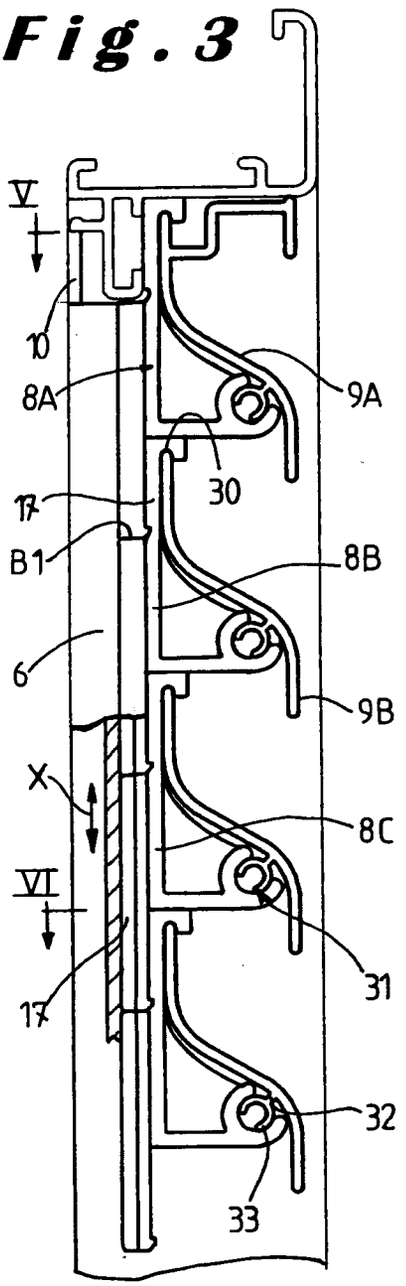
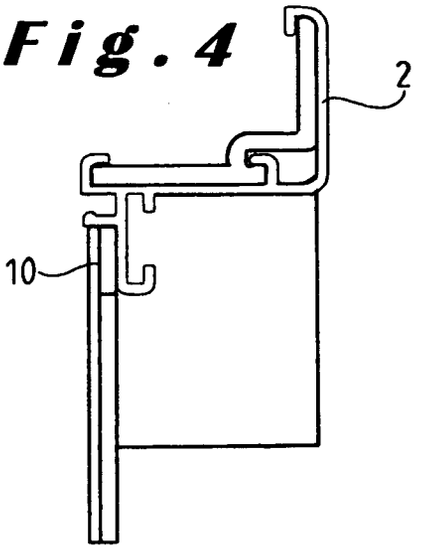


Fig. 4



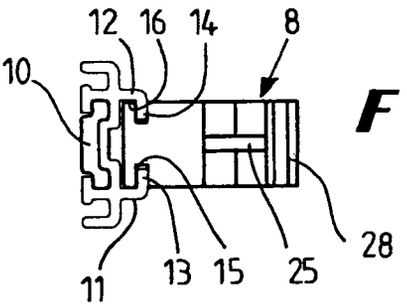


Fig. 5

Fig. 6

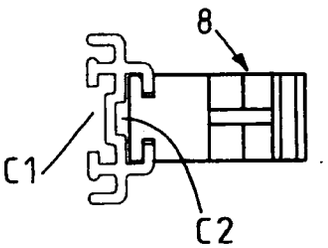


Fig. 7

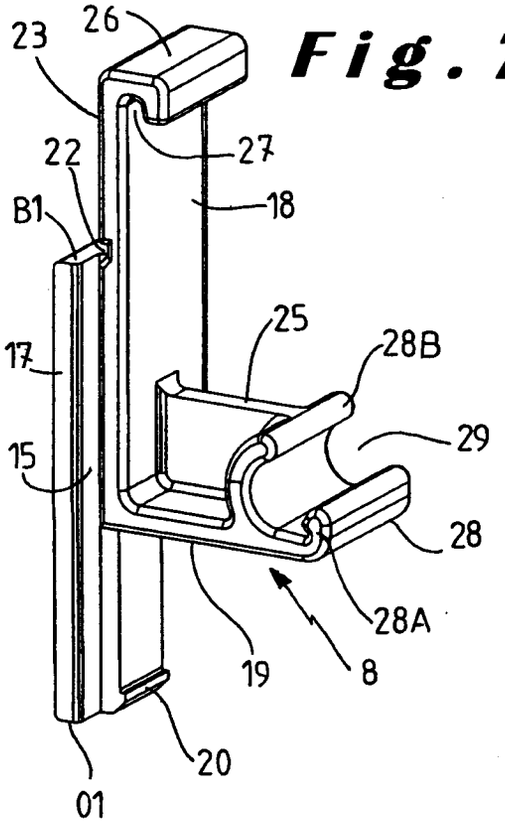


Fig. 8

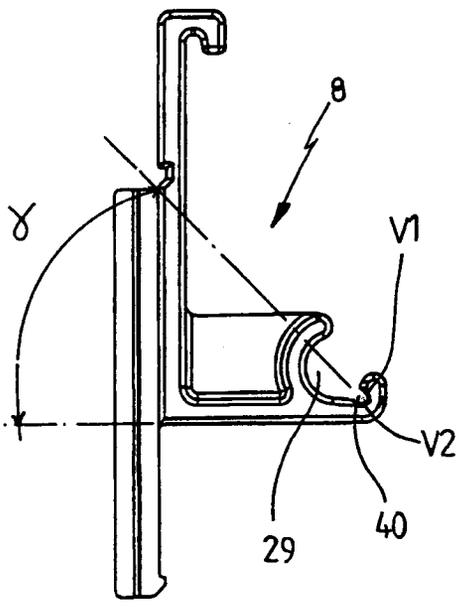


Fig. 9

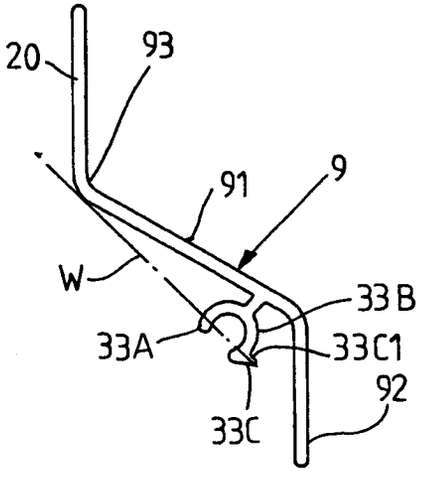


Fig. 10

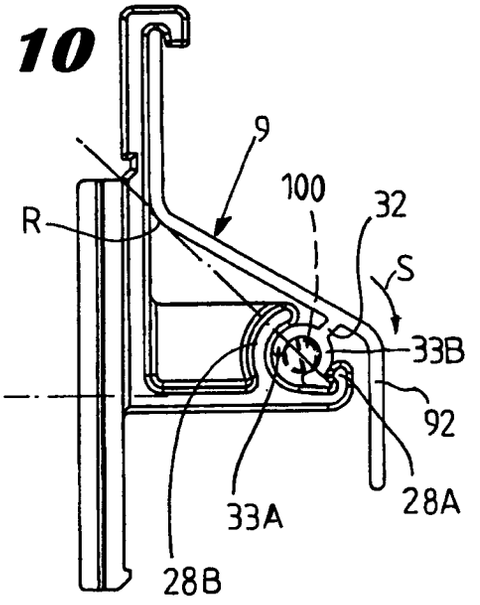


Fig. 11

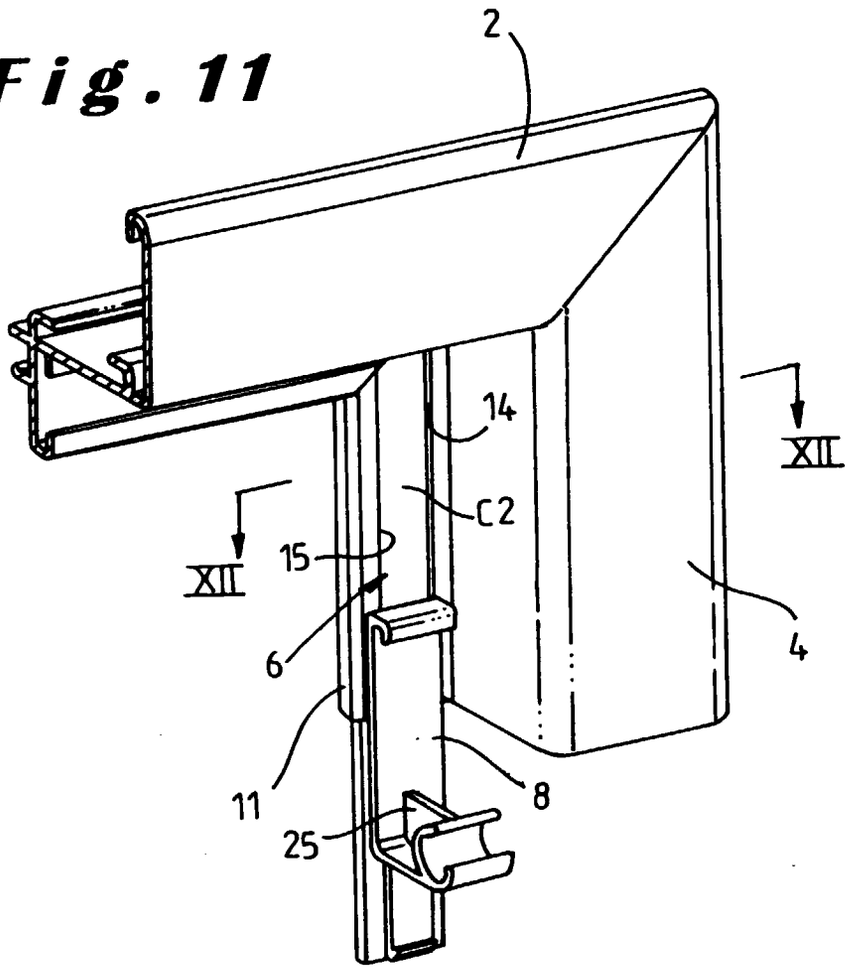


Fig. 12

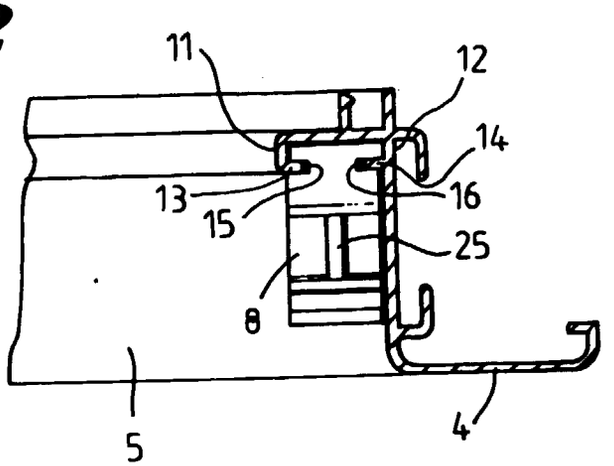
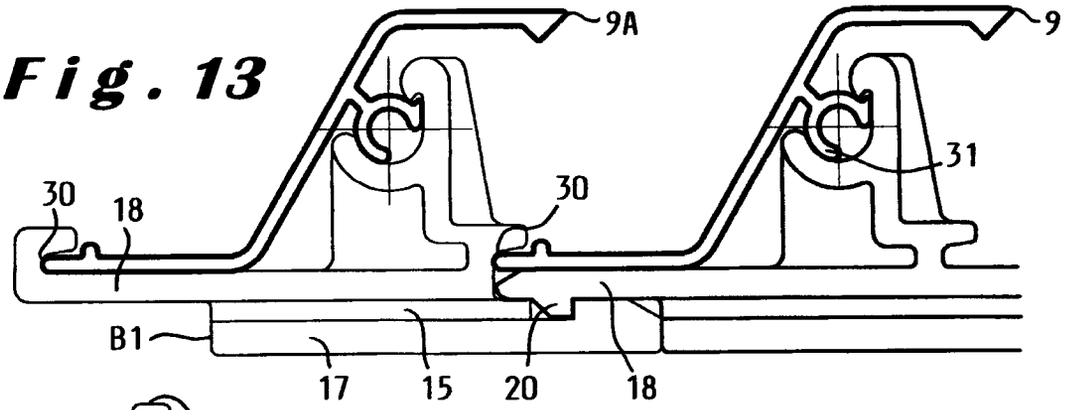


Fig. 13



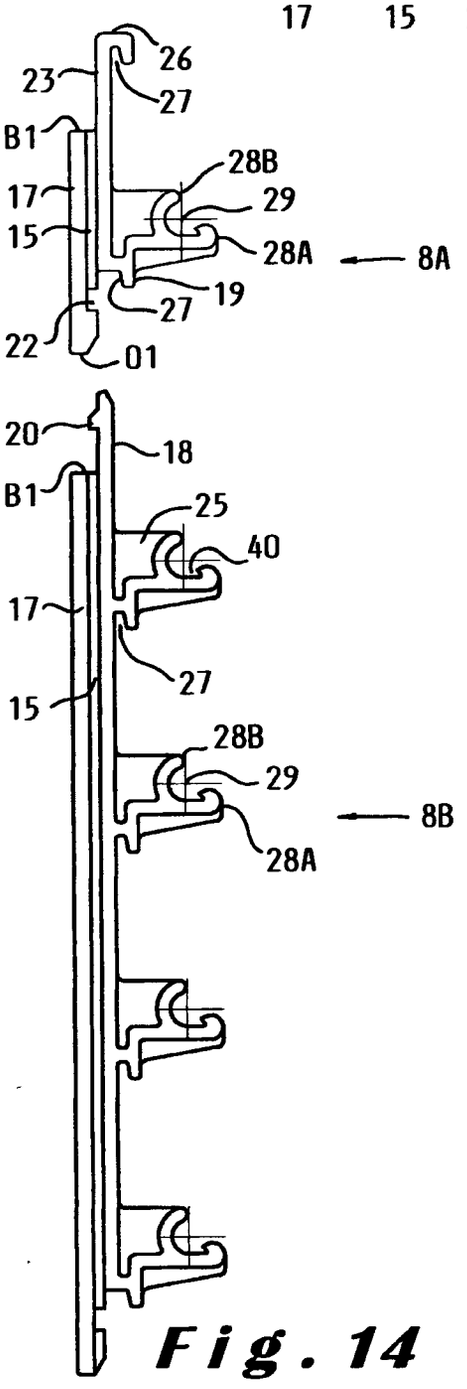


Fig. 14

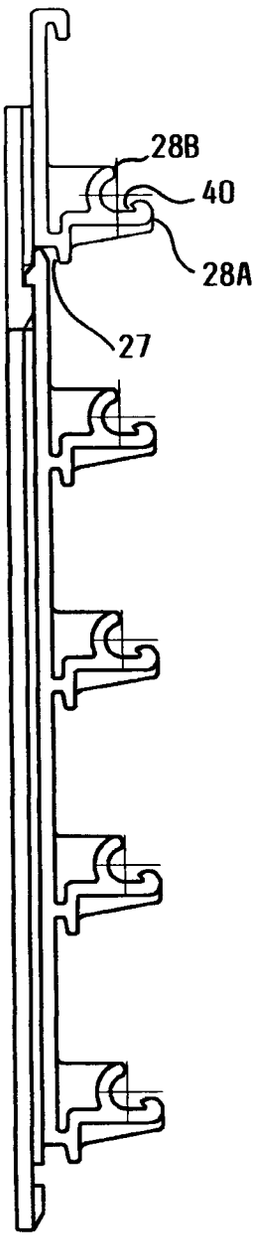


Fig. 15