(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 034 769 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
15.11.2017 Bulletin 2017/46

(51) Int Cl.:
E06B 7/10 *(2006.01)* ***E06B 9/52*** *(2006.01)*

(21) Application number: **15196060.6**

(22) Date of filing: **24.11.2015**

(54) **WINDOW SYSTEM WITH A VENTILATING PASSAGE IN A PROFILE ELEMENT**

FENSTERSYSTEM MIT EINEM LÜFTUNGSDURCHGANG IN EINEM PROFILELEMENT

SYSTÈME DE FENÊTRE AVEC UN PASSAGE DE VENTILATION DANS UN ÉLÉMENT PROFILÉ

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **24.11.2014 DK 201470734**

(43) Date of publication of application:
22.06.2016 Bulletin 2016/25

(73) Proprietor: **VKR Holding A/S**
2970 Hørsholm (DK)

(72) Inventor: **WIIG, Martin Schwartz**
8260 Viby J (DK)

(74) Representative: **Awapatent A/S**
Strandgade 56
1401 Copenhagen K (DK)

(56) References cited:
DE-A1- 4 026 236
US-A- 1 977 206
US-A- 4 969 291

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 3 034 769 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to a window system comprising a window including a frame and a sash, each having a plurality of members defining a frame and a sash plane, respectively, said sash (3; 103) being connected to the frame by means of at least one hinge connection, so that the sash can be moved from a closed position to an open position, and into an intermediate ventilating position, in which ventilating position the sash plane forms an angle within a limited angle range with the frame plane to provide at least one ventilating aperture in the circumferential of the frame and/or sash, and said window system further comprising a screening arrangement arranged to cover the said ventilating aperture in the ventilating position.

[0002] It is generally known from prior art to provide window system including windows with a ventilating position, in order to provide easy ventilation of a room without the need to fully open the window. In the ventilating position the windows thus have a ventilating aperture, through which not only air can flow, but also objects, such as insects, may enter. It is in generally known from prior art to block the entry of objects through the ventilating aperture by providing the windows with a screening arrangement.

[0003] Screening arrangements in such window systems are generally provided in the form of a screening curtain, netting or similar attached to either the frame or sash, or, in an activated screening position, to both the frame and sash, so that they can be manually activated by a user handling the screening arrangement after opening of the window or is automatically activated throughout the entire opening movement of the window, i.e. following the path of opening of the window so as to cover the full aperture provided in an open position of the window.

[0004] A screening arrangement of this kind is known from Applicant's application no. WO2005/005762 A1, which discloses a pivotal roof window having a screening arrangement arranged to provide screening of the top and/or bottom part of the window exclusively. The screening arrangement is moved automatically from an inactive position corresponding to the closed position of the window to an active position corresponding to the ventilating position, and from the active position to the inactive position when the window is brought from its ventilating position to its closed position. The screening arrangement is for example formed as an element hanging freely form the top and/or bottom member or as a curtain being connected to the top and bottom member of the frame and sash. Such screening arrangements are thus useful in the sense that they block out incoming objects in the top and/or bottom of the window effectively.

[0005] However, such screening arrangements must however be formed as an element hanging freely from either the frame and/or sash or being connected to both the frame and sash in order to cover at least the bottom aperture in the ventilating position, which may create an unwanted direct visible and to some degree aesthetically unpleasing screening arrangement.

[0006] Other solutions disclosed in the prior art are curtains or insect nets screening off the entire aperture between the sash and frame in the ventilating as well as open position of the window, as for example disclosed in US patent no. 2311413. This document describes a window, having a screening arrangement for screening off the aperture between the sash and frame in the open position of the window. Thus, the screening arrangement disclosed does not only cover a small aperture such as the aperture arising in the ventilating position of a window, but as the sash turns outwards when opening the window, the screening arrangement is activated so that it covers the entire opening angle between the frame and sash by a single insect net screening the entire opening angle. That is, the screening arrangement has the form of a curtain covering the aperture between the sides, top and bottom members of the window in the open position. US patent no. 1,997,206 discloses a solution where a screen is provided between the lower edge of the window sash and the forward edge portion of the sill, where the outer edge of the screen is inserted in a recess provided along the inner side of the lower portion of the sash.

[0007] Still further examples of prior art windows with screening arrangements are shown in US patent no. 4,969,291, DE 42 18 088 C1, WO 95/34739 A1 and DE 20 2008 006531 U1.

[0008] This solution for screening off especially the sides of the window is useful in the sense that it blocks out incoming objects such as insects, while providing a ventilating passage of the window both in an open position and a ventilating position of the window. However, when provided in a roof window, generally designed especially to facilitate easy window cleaning as the sash comprising the pane can be turned essentially 180° to allow cleaning of the outside surface of the pane from inside the building, with such screening arrangements you must remember that they have to be decoupled from the frame and/or sash in order to make the 180° rotation.

[0009] Furthermore, such arrangements limit the possibility of using the window as an exit, as in for instance fires, where the screening device has to be manually removed first, in order to create an unblocked escape opening.

[0010] Moreover, the large screening arrangement constituted by the prior art can be aesthetically unpleasing, as the screening arrangements are blocking at least portions of the view through the window. In some examples of the prior art, the screening arrangement is clearly visible, when the window is closed, which makes these solutions less advantageous.

[0011] Eventually, the provision of a screening arrangement in a window system will most often hamper the appearance of the window itself, just as it renders for instance cleaning and maintenance of the window more complex.

[0012] With this background it is the object of the

present invention to provide a window system with a window and a screening arrangement which meets the demands to a pleasant apperance and which is at the same time more flexible and cost-effective in manufacture, assembly and use.

[0013] This and further objects are met by a window system according to claim 1. By incorporating the screening arrangement as a screening element in the frame and/or sash members of the frame and/or sash itself, a simple and uncomplicated ventilating facility is achieved. Positioning the window in the ventilating position automatically provides screening of the ventilating aperture while at the same time allowing the air to pass by the first and second set of openings.

[0014] In a presently preferred embodiment, said at least one screening element including the ventilating passage is formed in a profile element having at least two adjacent sides of which the one side faces an interior or inner side of the window and constitutes said first face and the other side faces an exterior or outer side of the window and constitutes said second face. Providing the screening element as a profile element renders manufacture flexible, simple and cost-effective.

[0015] In a further development of the preferred embodiment, the profile element includes a cavity configured to allow air flow between the first set of openings and the second set of openings and vice versa. This configuration allows optimum utilization of the space available and increases the manufacturing efficiency even further.

[0016] The first set of openings may either be contiguous with the second set of openings, or, alternatively, a transition portion may be provided between the first face and the second face to separate the first set of openings from the second set of openings.

[0017] In one embodiment, which is particularly advantageous in the case of retrofitting of existing window systems, the ventilating passage is formed in a separate and detachable screening element configured to be connected to said at least one frame and/or sash member in a mounted condition of the window.

[0018] In an alternative embodiment, the ventilating passage is formed in the profile element constituting said at least one frame and/or sash member itself. This provides for a completely integrated solution of the screening arrangement in the window system and is particularly advantageous in fields of application allowing the frame and/or sash structure to be formed by profile elements.

[0019] In a further development of the alternative embodiment, the ventilation passage is provided by openings in the first face of the profile element and openings in the second face connected via a cavity of the profile element, the cavity being separated from other parts of the frame and/or sash member. This makes it possible to achieve sufficient ventilation while at the same time retaining sufficient strength and insulation properties of the overall window.

[0020] In a still further development, a sealing flange is provided to extend between the sash member and the frame member in the ventilating aperture of the window, such that the sealing flange abuts the transition portion in the ventilating position to allow air passage only via the ventilating passage. This provides for excellent control of the ventilating properties.

[0021] Further details and advantages will readily appear from the following description.

[0022] In the following the invention will be described in further details by means of examples of embodiments with reference to the schematic drawings, in which

Fig. 1 is a perspective side view of a window positioned in the ventilating position and having a ventilating aperture,

Fig. 2 is a perspective side view of a window corresponding to the window of Fig. 1, having a screening arrangement according to a first embodiment of the window according to the invention,

Fig. 3 is a perspective side view corresponding to Fig. 2, illustrating the screening arrangement in more detail,

Fig. 4 is perspective view of the window of Fig. 2, illustrating a top part of the window comprising the screening arrangement,

Fig. 5 is a perspective view of the window of Fig. 4, where parts of the window have been removed to show more clearly the screening arrangement,

Fig. 6 is a perspective top view of the window of Fig. 4,

Fig. 7 is a perspective top view of Fig. 5,

Fig. 8 and 9 are perspective side views of the window in the first embodiment of Fig. 2 illustrating the screening element in more detail and where the window in Fig. 9 is in a closed position,

Figs 10 and 11 are perspective views of the screening element in the first embodiment of the window according to the invention,

Fig. 12 is a perspective view of a window system in a second embodiment of the invention,

Fig. 13 is a schematic cross-sectional view of the window system of Fig. 12, and

Figs 14 and 15 are partial perspective cross-sectional views, on a larger scale, of the window system of Figs 12 and 13 in an open and in a closed position, respectively.

[0023] Referring initially to Figs 1 to 3, a window 1 of a window system in a first embodiment is shown. Generally as shown in the Figures showing the first embodiment, the window 1 comprises a frame 2 and a sash 3, and a hinge connection (not shown) providing a hinge axis allowing the sash 3 to rotate about the hinge axis. The frame 2 has a bottom member 4, a top member 6, and two side members 8 and 10. Correspondingly, the sash 3 is provided with a bottom member 5, a top member 7, and two side members 9 and 11.

[0024] In the embodiment shown, the window 1 is a

top-hung roof window having a position of the hinge axis near the top members 6; 7 of the frame 2 and sash 3, but the inventive concept is applicable also to centre-hung or traditional pivot windows having a hinge axis provided near a position halfway between the top and bottom members, just as a position of the hinge axis between the top and centre of the window is also possible. The hinge axis is thus substantially parallel with the top members 6; 7 of the frame 2 and sash 3, respectively. The window is adapted to be moved between at least three positions, namely a first closed position, where the plane formed by the sash 3 is substantially parallel with the plane formed by the frame 2, a second and ventilating position, where the plane of the sash 3 forms a predetermined angle with the plane of the frame, and a third and open position, where the sash plane forms an angle, larger than the angle in the ventilating position, with the frame plane.

[0025] As illustrated in Fig. 1, the sash 3 of the window 1, when in the ventilating position, forms a pre-defined angle with the frame plane and a ventilating aperture 20 is formed in the circumferential of the frame 2 and sash 3. The ventilating aperture 20 is at least partly covered by a screening arrangement, as illustrated in Fig. 2, where the screening arrangement comprises a screening element 21 incorporated in a member of the frame 2. In Fig. 2 it is only shown how the screening arrangement is incorporated in the frame structure; however it should be noticed that the screening arrangement could be arranged in the sash in a similar manner. In the first embodiment shown, a screening element is incorporated in each side member 8, 10 of the frame 2, but configurations having a screening element in only one side are conceivable as well, just as a screening element may be incorporated in the bottom member 4 of the frame 2 as well.

[0026] The screening element 21 is as shown in Fig. 2 incorporated in the frame so as to form a ventilating passage 22, and wherein the screening element 21 automatically spans the ventilating aperture 20 between the planes of the sash 3 and frame 2. In the first embodiment of the window 1, the screening arrangement is arranged in the frame 2, so that it is inconspicuous in both the open and ventilating position of the window 1. The term "inconspicuous" is intended to incorporate that the screening arrangement is placed in a way so it appears hidden or inconspicuous for the user's eye in both the open and ventilating position of the window. Furthermore, it is noted that the inconspicuous quality inherently excludes hindrance of the physical access through the opening. The inconspicuous characteristics of a first embodiment will be described in further detail in the following.

[0027] As illustrated in more detail in Figs 1, 2 and 3 the ventilating aperture 20 is covered by a screening arrangement, comprising the screening element 21, which is incorporated into the side members 8 and 10 of the frame. In Fig 1, the right side, i.e. the side of the window to the right side according to the orientation of the drawings, shows the ventilating aperture 20 without the screening element 21 for reasons of clarity. In the opposite, left side of the window in Fig. 1 the ventilating aperture 20 is shown covered by the screening element 21. When the window 1 is moved to the position shown in Fig. 1, i.e. the ventilating position, the ventilating passage 22 is formed through the the screening element 21 incorporated in the side frame member 8, 10. In this way the ventilating aperture 20 of Fig. 1 is covered by the screening element 21 as shown in Fig. 2, so that air can flow through the screening element 21 while closing off the ventilating aperture 20 between the sash 3 and frame 2. Insects and other objects trying to enter a room of a building from the outside are thus blocked out, since only air may flow through the ventilating passage 22 of the screening element 21.

[0028] Referring now to the closed position of the window as illustrated in Fig. 9, the screening element 21 is not visible from an interior side of the window, i.e. the screening element is not visible when a person stands in a room and looks at the window, as the side members 9, 11 of the sash cover the screening arrangement in the closed position.

[0029] When the window is moved to the open position, the screening element or elements are also inconspicuous, since each screening element is incorporated in the members of the frame or sash, in the embodiment shown in the side members 8, 10 of the frame. By being incorporated into the side members of the frame 2, the screening elements 21 do not prevent easy opening of the window to an open position or disturb the functions of the open window, including using this as an emergency exit. The function of the ventilating passage 22 created by the ventilating arrangement, comprising the screening element 21 is especially useful, when the window 1 is in the predetermined ventilating position, where it covers the ventilating aperture and thus blocks the entry of objects, such as insects or similar.

[0030] Even though not illustrated in the Figures of the first embodiment, the ventilating passage could be formed by incorporating the screening element in the side members of the sash instead of the side members of the frame, possibly in combination. Furthermore, it would be possible to provide a similar solution of the previously described, wherein the ventilating passage 22 is formed by incorporating the screening element 21 in at least one of the bottom members of the frame and/or sash.

[0031] The screening element 21, regardless of the member it is incorporated in, may extend the whole member it is incorporated in or a portion of the member, in order to form the ventilating passage 22. In the embodiment shown in Fig. 3, the ventilating passage 22 is formed to extend only a portion of the side members 8, 10 of the frame, as the screening element 21 is only perforated in a portion of its length. The length of extension of the ventilating passage 22 in the side members 8, 10 is chosen in accordance with the length of the screening element 21, which in turn is dependent on the desired amount of ventilation.

[0032] In the embodiment shown in Fig. 3, the ventilating passage 22 of the screening element 21 is incorporated in the bottom portion of the side members 8, 10 of the frame. This is a desired place to incorporate the ventilating passage 22 of the screening element 21 for top-hung windows, but in other cases, such as a centre-hung window, an incorporation of the screening element 21 in the top portion of the side members 8, 10 of the frame is just as desirable. By positioning the ventilating passage or passages near the bottom and/or top of the frame side members, optimal ventilating conditions are achieved, as opening the sash to a small angle presents a sufficient ventilating passage at a distance from the hinge axis.

[0033] For incorporation in other members than the side members of the frame, the bottom portions of the chosen members are desired places to incorporate the screening element for a top-hung window, and either the bottom or top portions are desired for non top-hung windows, such as pivotal or centre-hung windows. That is when using the screening element in centre-hung windows it may be desirable to block out entry in both the top and bottom apertures present in a ventilating position of the window.

[0034] In the specific embodiment shown, the screening element 21 is a detachable screening element 21 and the configuration of the screening element 21 is illustrated in more detail in Fig. 10 and 11. The screening element as being detachable is configured to be connected to the at least one frame member 8, 10 in a mounted condition thereof. This makes the screening element 21 suitable for retrofitting, so that it may be produced in different sizes for fitting into different sized windows.

[0035] For attaching the screening element 21 to the at least one side member 8, 10 of the frame, engagement means 40 are included in either the side member 8, 10, the bottom member 4 or in the screening element 21 in order to connect with the screening element 21 in a second end 26 of the screening element 21. The engagement means 40 of the bottom frame member 4 is, as illustrated in Fig. 9 configured as a groove in an engagement part 41 of the bottom frame member 4.

[0036] The screening element 21 is in Figs 10 and 11, illustrated as a screening element having the form of an L-shape, with a first flange 23 and a second flange 24, the second flange extending substantially perpendicular to the first flange 23, wherein at least one of the first and/or second flanges 23, 24 comprises the ventilating passage 22. The L-shaped screening element 21 is as previous described arranged to be incorporated in at least one of any of the frame and/or sash members 4, 5, 6, 7, 8, 9, 10, 11 in a mounted condition, and extends either over a portion of the member to which it is incorporated in or in the entire length of the member in question.

[0037] As illustrated in Fig. 6, the screening element 21 is mounted in the side member of the window, such that the first flange 23 in the mounted condition is arranged to abut the side sash member 9 such that the second flange 24 extends substantially perpendicular to the first flange 23 in a direction towards an exterior side of the window 1 so as to form the ventilating passage 22 of at least a part of the side frame member 8, when mounted in the window.

[0038] Furthermore as illustrated, especially in Fig. 7, the screening element 21 is arranged to cover a portion substantially extending the length of the side member 8, 10 of the frame. Thus, as the detachable screening element should be mounted in the frame member, the screening element is furthermore provided with a longitudinally extending slot 27 at a first end 25 of the screening element. The longitudinally extending slot 27 is as illustrated in more detail in Figs 10 and 11 provided in the surface of the second flange 24. The slot 27 is intended to engage with a control arrangement 30 of the window, the control arrangement having the function of provided a force for opening of the window. Furthermore the first end 25 of the screening element 21 is intended to connect with the top frame member 6 of the window so that the screening element when provided as a detachable element is attached to the side frame member 8, 10 in both ends through engagement means 40 of the bottom part of the window and abutting a top part of the frame, while being connected to a second groove 42 in the top part of the side frame member as seen in Fig. 7.

[0039] In the first embodiment described in the above, the L-shaped screening element 21 is provided as a thin-walled profile element of a material such as metal, plastic or composite. The thickness of the walls may for instance lie in the interval 0.5 to 10 mm, more preferably 1 to 8 mm, and still more preferably 2-5 mm. The manufacture of such an L-shaped thin-walled profile element lies well within the skills of the person skilled in the art, and will typically include technical means such as bending, moulding or extrusion in various sizes and shapes. The provision of ventilating passages may easily be incorporated into the manufacturing process according to the specific field of application of the window.

[0040] It should be noted that the invention is not limited to a screening element having an L-shape, but that any other suitable geometrical shape could be used, such that the screening element could be in the form of a U-shape, profile having a rectangular shape or a rounded profile shape.

[0041] As illustrated in the Figures in general, the ventilation passage 22 is formed as a plurality of perforations 22a, 22b in the material of the screening element 21 opening into a cavity 28 formed in the screening element and hence in turn of the frame member in which the screening element is incorporated. This is especially shown in Fig. 10 and 11, where the perforations in the lower end 26 of the L-shaped profile constitute the ventilating passage 22 of the screening element 21.

[0042] In the first embodiment shown and described in the above, the screening element is shown as a fixed element, i.e. with all portions remaining in the same po-

sition in all situations. It is conceivable, however, that the screening element may comprise a number of parts or portions which are movable relative to each other, for instance in dependence on the movement of the sash.

[0043] In the following, a second embodiment of the window system according to the invention will be described with particular reference to Figs 12 to 15. Only differences from the first embodiment will be described in detail. Elements having the same or analogous function will be denoted by the same reference numerals to which 100 has been added.

[0044] The window system of the second embodiment comprises a window 101 with a dome-shaped weather shield 106. Details other than those pertaining to the present invention are apparent from the embodiment of Applicant's WO 2009/080026 A1, to which explicit reference is hereby made and of which Figs 1 and 2 correspond to Figs 12 and 13, respectively.

[0045] As in the first embodiment, the screening arrangement comprises a screening element generally designated 121 incorporated in one, two, three or all four members of the frame 102 and/or sash 103.

[0046] In the specific form of the second embodiment, the screening element including the ventilating passage 122 is formed in a profile element 121 having at least two adjacent sides of which the one side faces an interior or inner side of the window and constitutes said first face 123 and the other side faces an exterior or outer side of the window and constitutes said second face 124. In the embodiment shown, the profile element 121 also constitutes the frame member 104 into which it is incorporated, that is, it forms an integral part of the frame member.

[0047] The profile element 121 includes a cavity 28 configured to allow air flow between the first set of openings 122a and the second set of openings 122b and vice versa.

[0048] In contrast to the first embodiment, the openings of the two sides of the screening element 121 are not contiguous, as a transition portion 129 is provided between the first face 123 and the second face 124, which separates the first set of openings 122a from the second set of openings 122b.

[0049] An additional inner wall 128a is located slightly below the second face 124 and is provided with a set of openings 122c. The openings 122c may either be positioned opposite openings 122b but may also be displaced relative to these openings.

[0050] As indicated, the cavity 128 is separated from other parts of the frame and/or sash member, namely by internal wall 128b.

[0051] A sealing flange 135 is provided to extend between the sash member and the frame member in the ventilating aperture 120 of the window 1, such that the sealing flange 135 abuts the transition portion 129 in the ventilating position to allow air passage only via the ventilating passage 122.

Claims

1. A window system comprising:

a window (1; 101) including a frame (2; 102) and a sash (3; 103), each having a plurality of members defining a frame and a sash plane, respectively, said sash (3; 103) being connected to the frame (2; 102) by means of at least one hinge connection, so that the sash (3; 103) can be moved from a closed position to an open position, and into an intermediate ventilating position, in which ventilating position the sash plane forms an angle within a limited angle range with the frame plane to provide at least one ventilating aperture (20; 120) in the circumferential of the frame (2; 102) and/or sash (3; 103), and

said window system further comprising a screening arrangement arranged to cover the said ventilating aperture (20; 120) in the ventilating position, wherein said screening arrangement comprises at least one screening element (21; 121) incorporated in at least one member of said frame (2; 102) and/or sash (3; 103), **characterized in that** said at least one screening element (21; 121) includes a ventilating passage (22; 122) with a first set of openings (22a; 122a) in a first face (23; 123) of the at least one frame or sash member and a second set of openings (22b; 122b) in a second face (24; 124) of the at least one frame or sash member to provide connection to the at least one ventilating aperture (20; 120) in the ventilating position of the window (1; 101).

2. A window system according to claim 1, wherein said at least one screening element including the ventilating passage (22; 122) is formed in a profile element (21; 121) having at least two adjacent sides of which the one side faces an interior or inner side of the window and constitutes said first face (23; 123) and the other side faces an exterior or outer side of the window and constitutes said second face (24; 124).

3. A window system according to claim 2, wherein the profile element (21; 121) includes a cavity (28; 128) configured to allow air flow between the first set of openings (22a; 122a) and the second set of openings (22b; 122b) and vice versa.

4. A window system according to claim 2 or 3, wherein the first set of openings (22a) of the first face (23) is contiguous with the second set of openings (22b) of the second face (24).

5. A window system according to claim 2 or 3, wherein a transition portion (129) between the first face (123)

and the second face (124) separates the first set of openings (122a) from the second set of openings (122b).

6. A window system according to any one of claims 2 to 5, wherein said ventilating passage (22) is formed in a separate and detachable screening element (21) configured to be connected to said at least one frame and/or sash member in a mounted condition of the window (1).

7. A window system according to claim 6, wherein said screening element (21) is in the form of an L-shape, having a first flange (23) as its first face and a second flange (24) as its second face, said second flange (24) extending perpendicularly to said first flange (23), wherein said first and second flanges (23, 24) each comprises openings (22a, 22b) of said ventilating passage (22).

8. A window system according to claim 6 or 7, wherein said window is a top-hung or centre-hung roof window (1), and wherein said at least one screening element (21) including the ventilating passage (22) is incorporated in one of or both side frame members (8, 10) of said window so as to form the ventilating passage (22) in at least one of said side frame members (8, 10), preferably one screening element (21) in each side frame member (8, 10), and more preferably exclusively in one of or both side frame members (8, 10).

9. A window system according to claim 8, wherein said first flange (23) is arranged to abut said side sash member (9, 11) in a mounted condition of the screening element (21), such that said second flange (24) extends perpendicularly thereto in a direction towards an exterior side of said window (1) to form said ventilating passage (22) of at least a part of said side frame member (8, 10).

10. A window system according to claim 6 or 7, wherein said screening element (21) is in the form of a U-shape and/or having a rectangular profile shape.

11. A window system according to any one of claims 6 to 10, wherein the screening element (21) is provided as a thin-walled profile element of a material such as metal, plastic or composite.

12. A window system according to any one of claims 2 to 5, wherein the ventilating passage (122) is formed in the profile element (121) constituting said at least one frame and/or sash member itself.

13. A window system according to claims 3 and 12, wherein the ventilation passage (122) is provided by openings (122a) in the first face (123) of the profile element (121) and openings (122b) in the second face (124) connected via the cavity (128) of the profile element (121), the cavity (128) being separated from other parts of the frame and/or sash member.

14. A window system according to claims 5 and 13, wherein a sealing flange (135) is provided to extend between the sash member and the frame member in the ventilating aperture (120) of the window (1), such that the sealing flange (135) abuts the transition portion (129) in the ventilating position to allow air passage only via the ventilating passage (122).

15. A window system according to any one of claims 2 to 14, wherein said ventilating passage (22; 122) extends at least partly along the profile element (21; 121) forming a ventilating passage (22) in only a part of the profile element (21; 121) in which the screening arrangement is incorporated.

16. A window system according to claim 2 to 15, wherein said ventilating passage (22) is arranged in a portion of the profile element (21; 121) furthest away from the hinge connection and extends in a pre-defined distance in the longitudinal direction along the profile element, said ventilating passage preferably extending half the length of saidprofile element (21; 121), more preferably extending a third of the length of said profile element (21; 121).

17. A window system according to any one of claims 2 to 16, wherein said ventilating passage (22; 122) is formed as a plurality of perforations in the material of said profile element (21; 121).

18. A window system according to any one of claims 2 to 18, wherein said ventilating passage (22; 122) comprises a limited set of openings in the profile element (21; 121) covered by a separate netting unit.

Patentansprüche

1. Fenstersystem aufweisend

ein Fenster (1; 101) mit einem Rahmen (2; 102) und einem Flügel (3; 103), die jeweils eine Anzahl an Bauteilen aufweisen, die eine Rahmenebene und eine Flügelebene definieren, wobei der Flügel (3; 103) durch wenigstens eine Scharnierverbindung mit dem Rahmen (2; 102) verbunden ist, so dass der Flügel (3; 103) aus einer geschlossenen Position in eine offene Position und in eine dazwischenliegende Belüftungsposition bewegt werden kann, wobei die Flügelebene in der Belüftungsposition einen Winkel innerhalb eines begrenzten Winkelbereichs mit der Rahmenebene formt, um wenigstens eine

Ventilationsöffnung (20; 120) im Umfang des Rahmens (2; 102) und/oder des Flügels (3; 103) bereitzustellen,
wobei das Fenstersystem ferner eine Abschirmungsanordnung zum Abdecken der Ventilationsöffnung (20; 120) in der Belüftungsposition aufweist,
wobei die Abschirmungsanordnung wenigstens ein Abschirmungselement (21; 121) aufweist, das in wenigstens ein Bauteil des Rahmens (2; 102) und/oder des Flügels (3; 103) eingebaut ist,
dadurch gekennzeichnet, dass das wenigstens eine Abschirmungselement (21; 121) einen Belüftungsdurchgang (22; 122) aufweist, der einen ersten Satz von Öffnungen (22a; 122a) in einer ersten Fläche (23; 123) des wenigstens einen Rahmenbauteils oder Flügelbauteils und einen zweiten Satz von Öffnungen (22b; 122b) in einer zweiten Fläche (24; 124) des wenigstens einen Rahmenbauteils oder Flügelbauteils umfasst, um in der Belüftungsposition des Fensters (1; 101) eine Verbindung zu der wenigstens einen Belüftungsöffnung (20; 120) herzustellen.

2. Fenstersystem nach Anspruch 1, wobei das wenigstens eine Abschirmungselement mit dem Belüftungsdurchgang (22; 122) in einem Profilelement (21; 121) ausgebildet ist, wobei das Profilelement (21; 121) wenigstens zwei benachbarte Seiten aufweist, von denen eine dem Inneren oder einer inneren Seite des Fensters zugewandt ist und die erste Fläche (23; 123) bildet, wobei die andere Seite einer Außenseite oder einer äußeren Seite des Fensters zugewandt ist und die zweite Fläche (24; 124) bildet.

3. Fenstersystem nach Anspruch 2, wobei das Profilelement (21; 121) einen Hohlraum (28; 128) aufweist, der derart ausgebildet ist, dass Luft zwischen dem ersten Satz von Öffnungen (22a; 122a) und dem zweiten Satz von Öffnungen (22b; 122b) und vice versa strömen kann.

4. Fenstersystem nach Anspruch 2 oder 3, wobei der erste Satz von Öffnungen (22a) der ersten Fläche (23) benachbart zu dem zweiten Satz von Öffnungen (22b) der zweiten Fläche (24) liegt.

5. Fenstersystem nach Anspruch 2 oder 3, wobei ein Übergangsabschnitt (129) zwischen der ersten Fläche (123) und der zweiten Fläche (124) den ersten Satz von Öffnungen (122a) von dem zweiten Satz von Öffnungen (122b) trennt.

6. Fenstersystem nach einem der Ansprüche 2 bis 5, wobei der Belüftungsdurchgang (22) in einem separaten und abnehmbaren Abschirmungselement (21) vorgesehen ist, das dazu ausgebildet ist, in einem montierten Zustand des Fensters (1) mit wenigstens einem Rahmenbauteil und/oder einem Flügelbauteil verbunden zu sein.

7. Fenstersystem nach Anspruch 6, wobei das Abschirmungselement (21) eine L-Form aufweist und einen ersten Flansch (23) als seine erste Fläche und einen zweiten Flansch (24) als seine zweite Fläche aufweist, wobei der zweite Flansch (24) sich senkrecht zu dem ersten Flansch (23) erstreckt, wobei die ersten und zweiten Flansche (23, 24) jeweils Öffnungen (22a, 22b) des Belüftungsdurchgangs (22) aufweisen.

8. Fenstersystem nach Anspruch 6 oder 7, wobei das Fenster ein oben aufgehängtes oder zentral aufgehängtes Dachfenster (1) ist, und wobei das wenigstens eine Abschirmungselement (21) mit dem Belüftungsdurchgang (22) in ein oder beide seitliche Rahmenbauteile (8, 10) des Fensters eingebaut ist, so dass der Belüftungsdurchgang (22) in wenigstens einem der seitlichen Rahmenbauteile (8, 10), vorzugsweise mit einem Abschirmungselement (21) in jedem seitlichen Rahmenbauteil (8, 10) und besonders bevorzugt, ausschließlich in einem oder beiden seitlichen Rahmenbauteile (8, 10) ausgebildet ist.

9. Fenstersystem nach Anspruch 8, wobei der erste Flansch (23) derart angeordnet ist, dass er in einem montierten Zustand des Abschirmungselements (21) gegen das seitliche Flügelbauteil (9, 11) anliegt, so dass der zweite Flansch (24) sich senkrecht dazu in einer Richtung zu einer äußeren Seite des Fensters (1) hin erstreckt, so dass der Belüftungsdurchgang von wenigstens einem Teil des seitlichen Rahmenbauteils (8, 10) gebildet wird.

10. Fenstersystem nach Anspruch 6 oder 7, wobei das Abschirmungselement (21) eine U-Form und/oder eine rechteckige Profilform aufweist.

11. Fenstersystem nach einem der Ansprüche 6 bis 10, wobei das Abschirmungselement (21) als dünnwandiges Profilelement aus einem Material wie Metall, Kunststoff oder einem Verbundstoff bereitgestellt ist.

12. Fenstersystem nach einem der Ansprüche 2 bis 5, wobei der Belüftungsdurchgang (122) in dem Profilelement (121) ausgebildet ist, wobei das Profilelement (121) selbst das wenigstens eine Rahmenbauteil und/oder Flügelbauteil bildet.

13. Fenstersystem nach den Ansprüchen 3 und 12, wobei der Belüftungsdurchgang (122) durch Öffnungen (122a) in der ersten Fläche (123) des Profilelements (121) und Öffnungen (122b) in der zweiten Fläche (124), die über den Hohlraum (128) des Profilelements (121) verbunden sind, bereitgestellt wird, wobei der Hohlraum (128) von den anderen Teilen des

Rahmenbauteils und/oder des Flügelbauteils getrennt ist.

14. Fenstersystem nach den Ansprüchen 5 und 13, wobei sich ein Dichtungsflansch (135) zwischen dem Flügelbauteil und dem Rahmenbauteil in der Ventilationsöffnung (120) des Fensters (1) erstreckt, so dass der Dichtungsflansch (135) in der Belüftungsposition gegen den Übergangsabschnitt (129) anliegt, so dass Luft ausschließlich durch den Belüftungsdurchgang (122) strömen kann.

15. Fenstersystem nach einem der Ansprüche 2 bis 14, wobei der Belüftungsdurchgang (22; 122) sich wenigstens teilweise entlang des Profilelements (21; 121) erstreckt, so dass ein Belüftungsdurchgang (22) nur in einem Teil des Profilelements (21; 121), in dem die Abschirmungsanordnung eingebaut ist, ausgebildet ist.

16. Fenstersystem nach den Ansprüchen 2 bis 15, wobei der Belüftungsdurchgang (22) in einem Abschnitt des Profilelements (21; 121) angeordnet ist, der am weitesten weg von der Scharnierverbindung liegt und sich in einem vorgegebenen Abstand in der Längsrichtung entlang des Profilelements erstreckt, wobei der Belüftungsdurchgang sich vorzugsweise über die Hälfte der Länge des Profilelements (21; 121) erstreckt, wobei sich der Belüftungsdurchgang besonders bevorzugt entlang eines Drittels der Länge des Profilelements (21; 121) erstreckt.

17. Fenstersystem nach einem der Ansprüche 2 bis 16, wobei der Belüftungsdurchgang (22; 122) aus einer Anzahl an Perforationen in dem Material des Profilelements (21; 121) gebildet ist.

18. Fenstersystem nach einem der Ansprüche 2 bis 18, wobei der Belüftungsdurchgang (22; 122) einen begrenzten Satz von Öffnungen in dem Profilelement (21; 121) aufweist, das durch eine separate Netzeinheit abgedeckt ist.

Revendications

1. Système de fenêtre comprenant :

une fenêtre (1 ; 101) incluant un cadre (2 ; 102) et un châssis (3; 103), chacun ayant une pluralité d'organes définissant un cadre et un plan de châssis, respectivement, ledit châssis (3 ; 103) étant raccordé au cadre (2 ; 102) au moyen d'au moins un raccordement par charnière, de sorte que le châssis (3 ; 103) puisse être déplacé d'une position fermée à une position ouverte, et dans une position de ventilation intermédiaire, position de ventilation dans laquelle le plan de châssis forme un angle dans une plage d'angles limitée avec le plan de cadre pour fournir au moins une ouverture de ventilation (20 ; 120) dans la circonférence du cadre (2 ; 102) et/ou du châssis (3 ; 103), et
ledit système de fenêtre comprenant en outre un agencement de criblage agencé pour couvrir ladite ouverture de ventilation (20 ; 120) dans la position de ventilation,
dans lequel ledit agencement de criblage comprend au moins un élément de criblage (21 ; 121) incorporé dans au moins un organe dudit cadre (2 ; 102) et/ou du châssis (3 ; 103), **caractérisé en ce que** ledit au moins un élément de criblage (21 ; 121) inclut un passage de ventilation (22 ; 122) avec un premier jeu d'ouvertures (22a ; 122a) dans une première face (23 ; 123) de l'au moins un organe de cadre ou de châssis et un second jeu d'ouvertures (22b ; 122b) dans une seconde face (24 ; 124) de l'au moins un organe de cadre ou de châssis pour assurer un raccordement à l'au moins une ouverture de ventilation (20 ; 120) dans la position de ventilation de la fenêtre (1 ; 101).

2. Système de fenêtre selon la revendication 1, dans lequel ledit au moins un élément de criblage incluant le passage de ventilation (22 ; 122) est formé dans un élément de profilé (21 ; 121) ayant au moins deux côtés adjacents dont le premier côté fait face à un côté intérieur ou interne de la fenêtre et constitue ladite première face (23 ; 123) et l'autre côté fait face à un côté extérieur ou externe de la fenêtre et constitue ladite seconde face (24 ; 124).

3. Système de fenêtre selon la revendication 2, dans lequel l'élément de profilé (21 ; 121) inclut une cavité (28 ; 128) configurée pour permettre un écoulement d'air entre le premier jeu d'ouvertures (22a ; 122a) et le second jeu d'ouvertures (22b ; 122b) et vice versa.

4. Système de fenêtre selon la revendication 2 ou 3, dans lequel le premier jeu d'ouvertures (22a) de la première face (23) est contigu avec le second jeu d'ouvertures (22b) de la seconde face (24).

5. Système de fenêtre selon la revendication 2 ou 3, dans lequel une portion de transition (129) entre la première face (123) et la seconde face (124) sépare le premier jeu d'ouvertures (122a) du second jeu d'ouvertures (122b).

6. Système de fenêtre selon l'une quelconque des revendications 2 à 5, dans lequel ledit passage de ventilation (22) est formé dans un élément de criblage séparé et détachable (21) configuré pour être raccordé audit au moins un organe de cadre et/ou de

châssis dans une condition montée de la fenêtre (1).

7. Système de fenêtre selon la revendication 6, dans lequel ledit élément de criblage (21) se présente sous la forme d'un L, ayant une première bordure (23) en tant que sa première face et une seconde bordure (24) en tant que sa seconde face, ladite seconde bordure (24) s'étendant perpendiculairement à ladite première bordure (23), dans lequel lesdites première et seconde bordures (23, 24) comprennent chacune des ouvertures (22a, 22b) dudit passage de ventilation (22).

8. Système de fenêtre selon la revendication 6 ou 7, dans lequel ladite fenêtre est une fenêtre de toit à soufflet ou basculante (1), et dans lequel ledit au moins un élément de criblage (21) incluant le passage de ventilation (22) est incorporé dans l'un des organes de cadre latéraux (8, 10) ou les deux de ladite fenêtre de manière à former le passage de ventilation (22) dans au moins l'un desdits organes de cadre latéraux (8, 10), de préférence un élément de criblage (21) dans chaque organe de cadre latéral (8, 10), et de de manière davantage préférée exclusivement dans l'un des organes de cadre latéraux (8, 10) ou les deux.

9. Système de fenêtre selon la revendication 8, dans lequel ladite première bordure (23) est agencée pour venir en butée contre ledit organe de châssis latéral (9, 11) dans une condition montée de l'élément de criblage (21), de telle sorte que ladite seconde bordure (24) s'étend perpendiculairement à celui-ci dans une direction vers un côté extérieur de ladite fenêtre (1) pour former ledit passage de ventilation (22) d'au moins une partie dudit organe de cadre latéral (8, 10).

10. Système de fenêtre selon la revendication 6 ou 7, dans lequel ledit élément de criblage (21) se présente sous la forme d'un U et/ou ayant une forme de profilé rectangulaire.

11. Système de fenêtre selon l'une quelconque des revendications 6 à 10, dans lequel l'élément de criblage (21) est ménagé sous forme d'élément de profilé à paroi fine d'un matériau tel qu'un métal, un plastique ou un composite.

12. Système de fenêtre selon l'une quelconque des revendications 2 à 5, dans lequel le passage de ventilation (122) est formé dans l'élément de profilé (121) constituant ledit au moins un organe de cadre et/ou de châssis lui-même.

13. Système de fenêtre selon les revendications 3 et 12, dans lequel le passage de ventilation (122) est ménagé par des ouvertures (122a) dans la première face (123) de l'élément de profilé (121) et des ouvertures (122b) dans la seconde face (124) raccordées via la cavité (128) de l'élément de profilé (121), la cavité (128) étant séparée d'autres parties de l'organe de cadre et/ou de châssis.

14. Système de fenêtre selon les revendications 5 et 13, dans lequel une bordure d'étanchement (135) est ménagée pour s'étendre entre l'organe de châssis et l'organe de cadre dans l'ouverture de ventilation (120) de la fenêtre (1), pour que la bordure d'étanchement (135) vienne en butée contre la portion de transition (129) dans la position de ventilation pour permettre un passage d'air uniquement via le passage de ventilation (122).

15. Système de fenêtre selon l'une quelconque des revendications 2 à 14, dans lequel ledit passage de ventilation (22 ; 122) s'étend au moins en partie le long de l'élément de profilé (21 ; 121) formant un passage de ventilation (22) dans uniquement une partie de l'élément de profilé (21 ; 121) dans lequel l'agencement de criblage et incorporé.

16. Système de fenêtre selon les revendications 2 à 15, dans lequel ledit passage de ventilation (22) est agencé dans une portion de l'élément de profilé (21 ; 121) plus loin du raccordement par charnière et s'étend à une distance prédéfinie dans la direction longitudinale le long de l'élément de profilé, ledit passage de ventilation s'étendant de préférence à mi-longueur dudit élément de profilé (21 ; 121), de manière davantage préférée s'étendant au tiers de la longueur dudit élément de profilé (21 ; 121).

17. Système de fenêtre selon l'une quelconque des revendications 2 à 16, dans lequel ledit passage de ventilation (22 ; 122) est formé sous la forme d'une pluralité de perforations dans le matériau dudit élément de profilé (21 ; 121).

18. Système de fenêtre selon l'une quelconque des revendications 2 à 17, dans lequel ledit passage de ventilation (22 ; 122) ; comprend un jeu limité d'ouvertures dans l'élément de profilé (21 ; 121) couvert par une unité de maillage séparée.

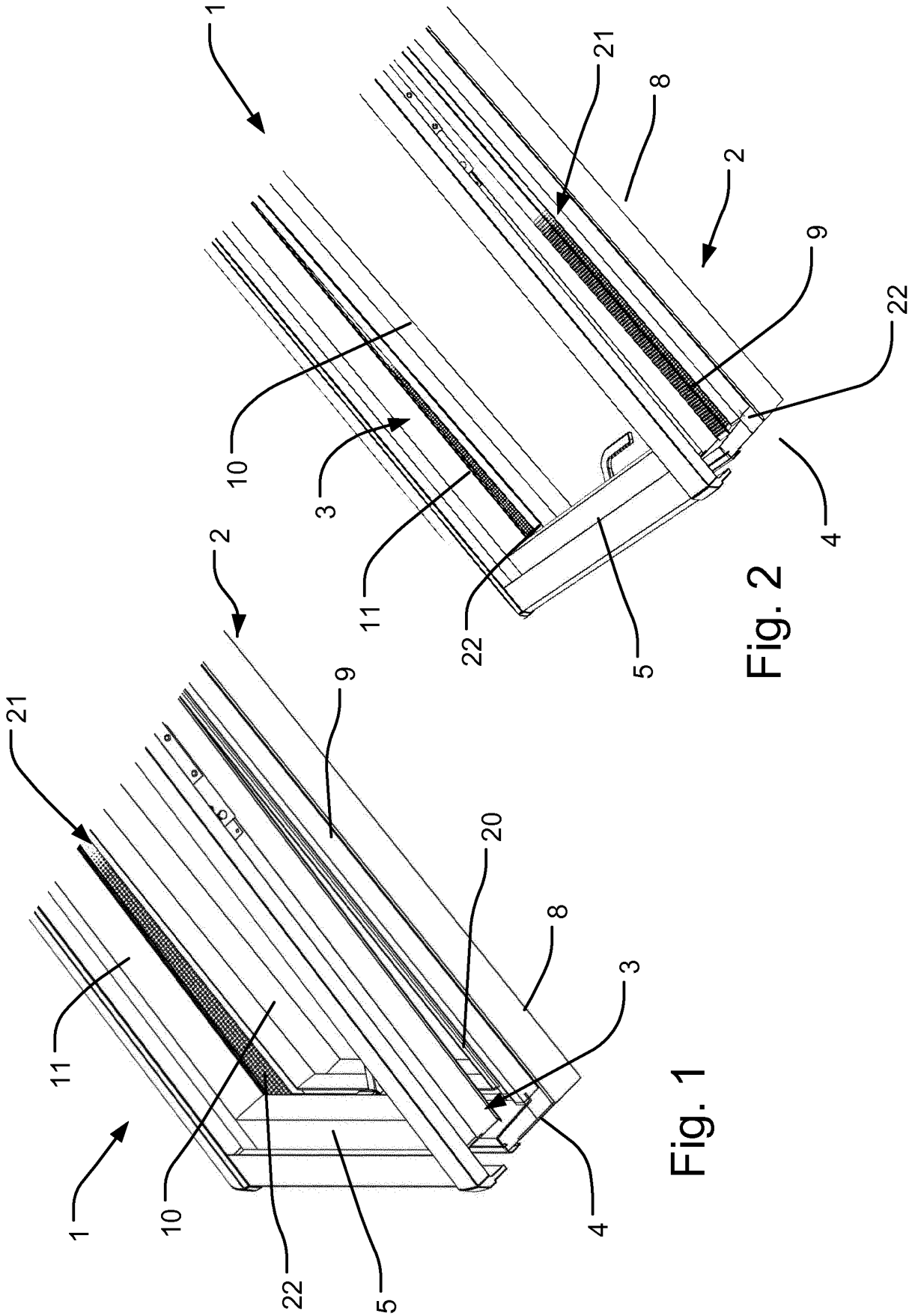


Fig. 2

Fig. 1

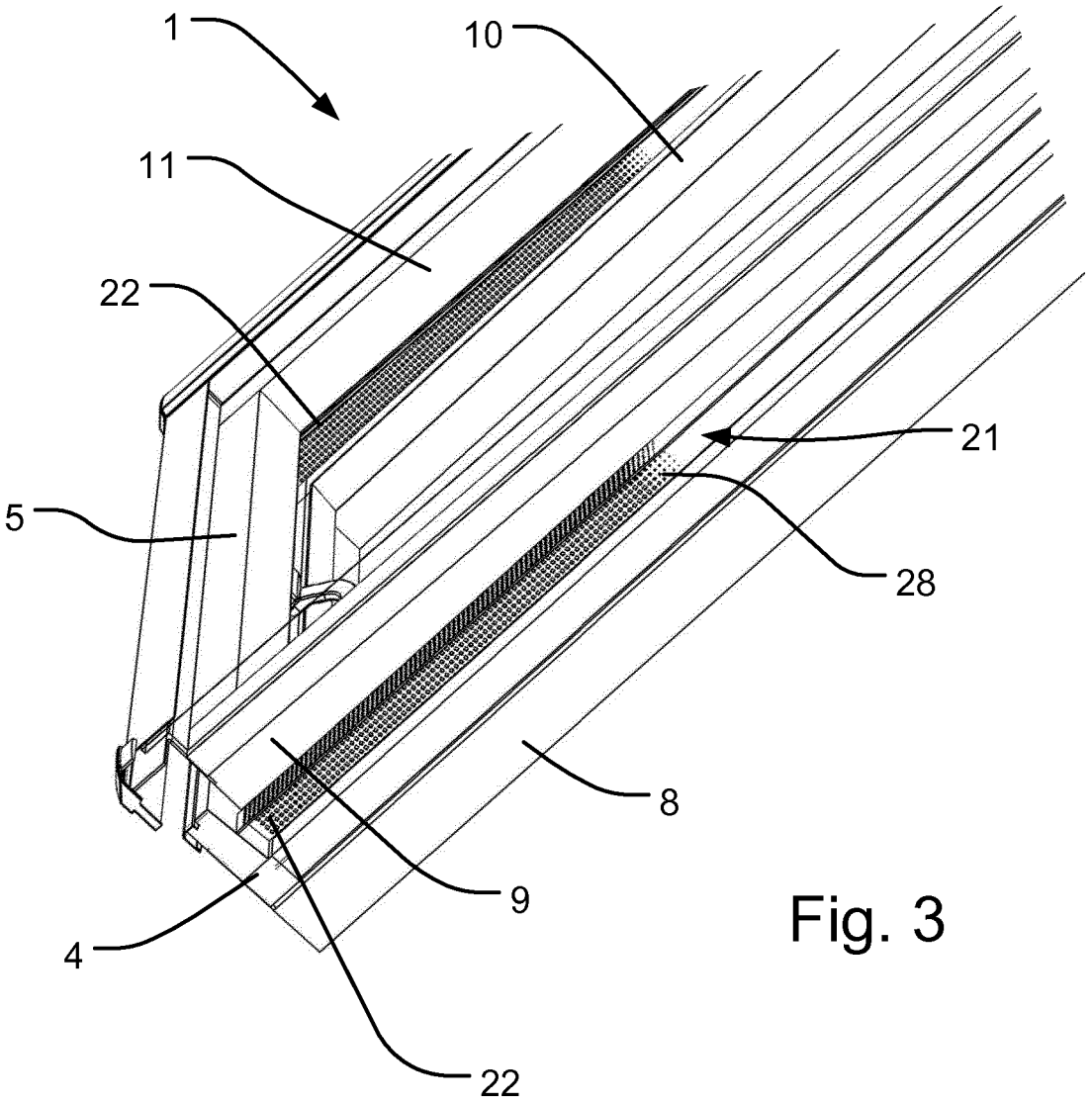


Fig. 3

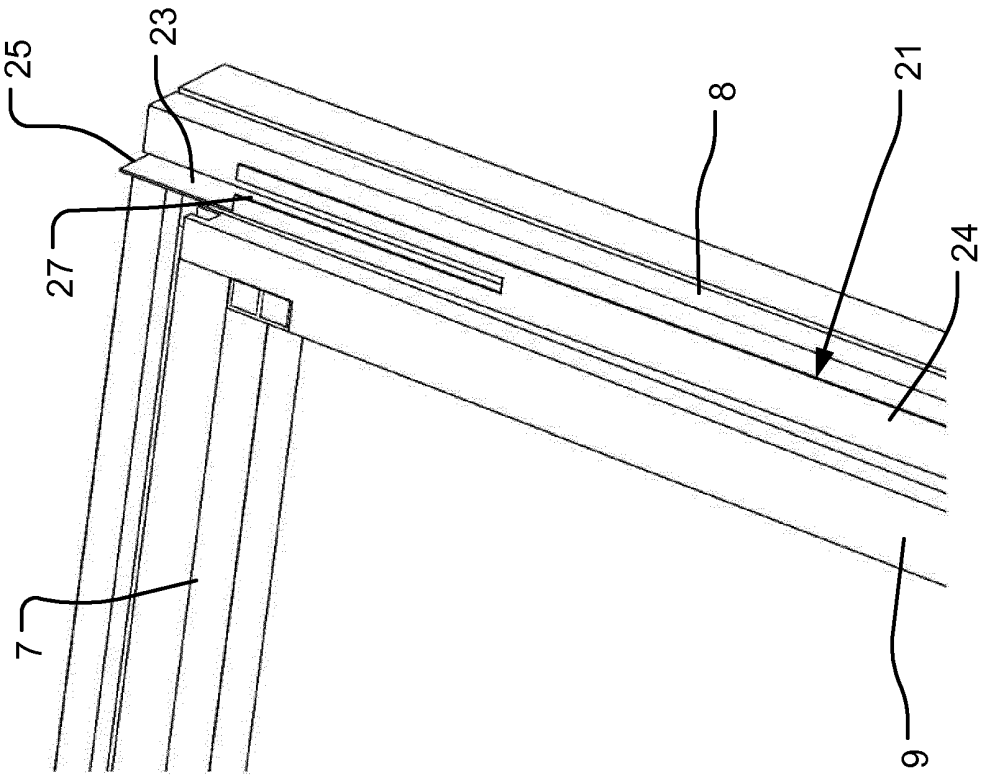


Fig. 5

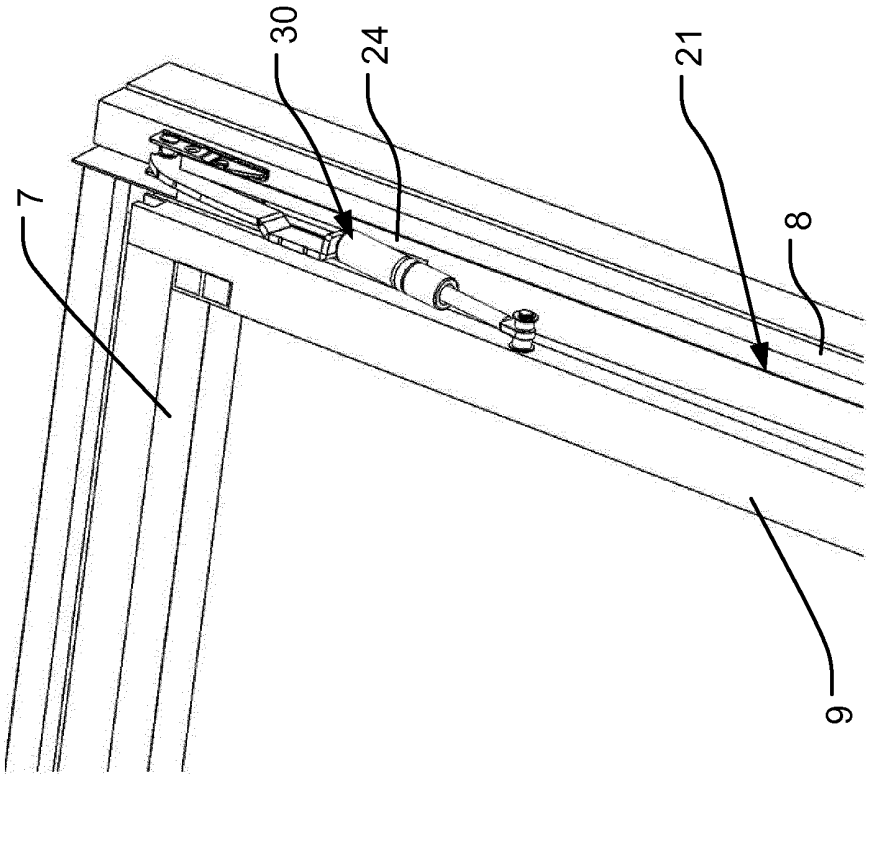


Fig. 4

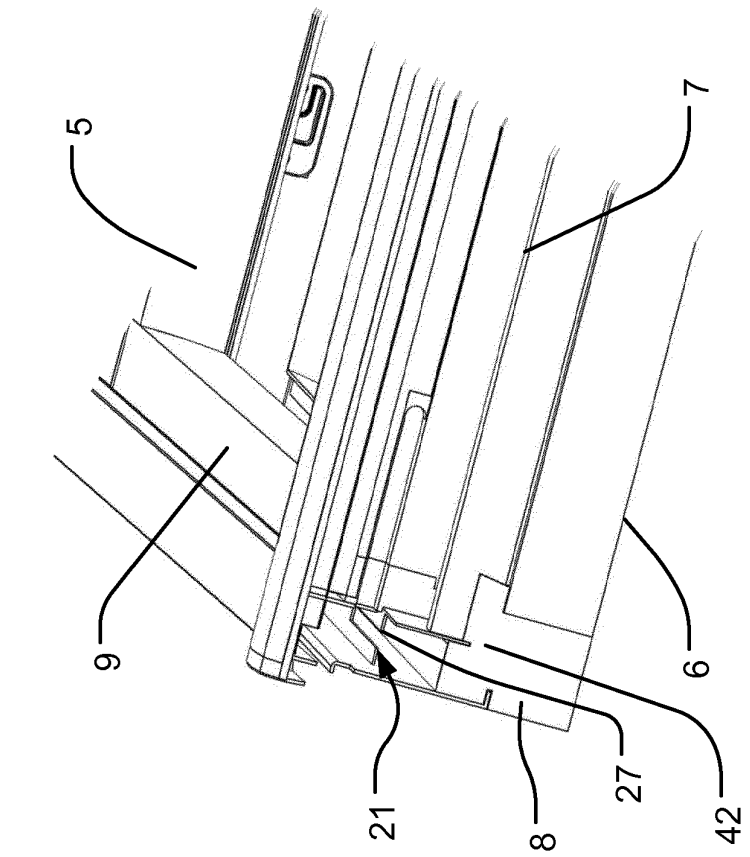


Fig. 7

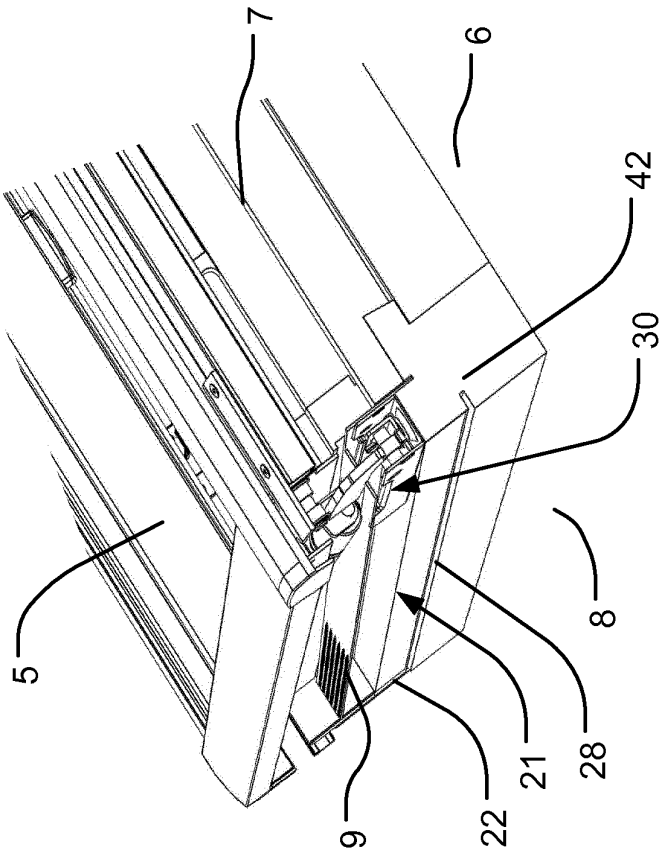


Fig. 6

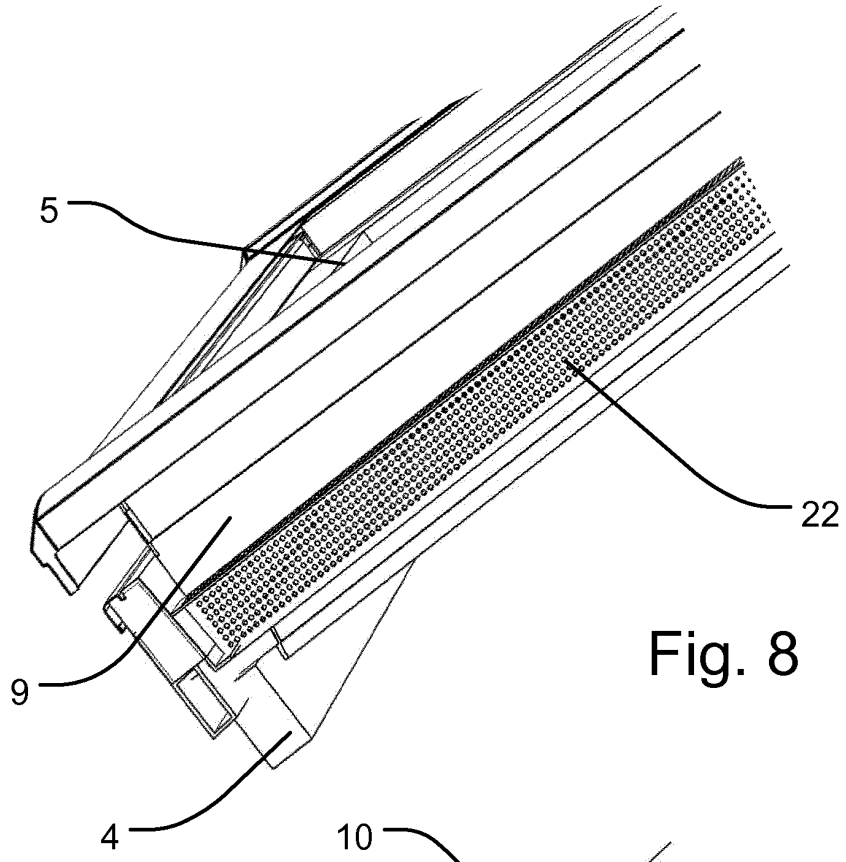


Fig. 8

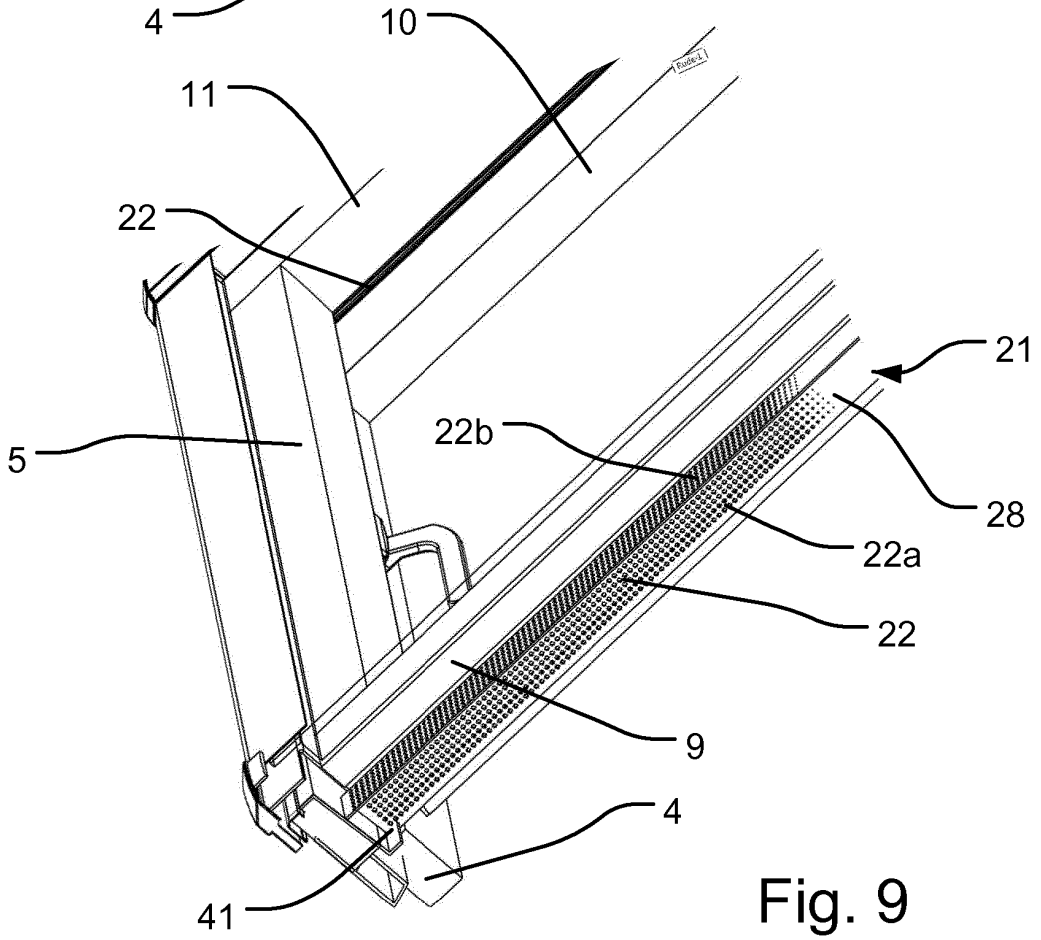


Fig. 9

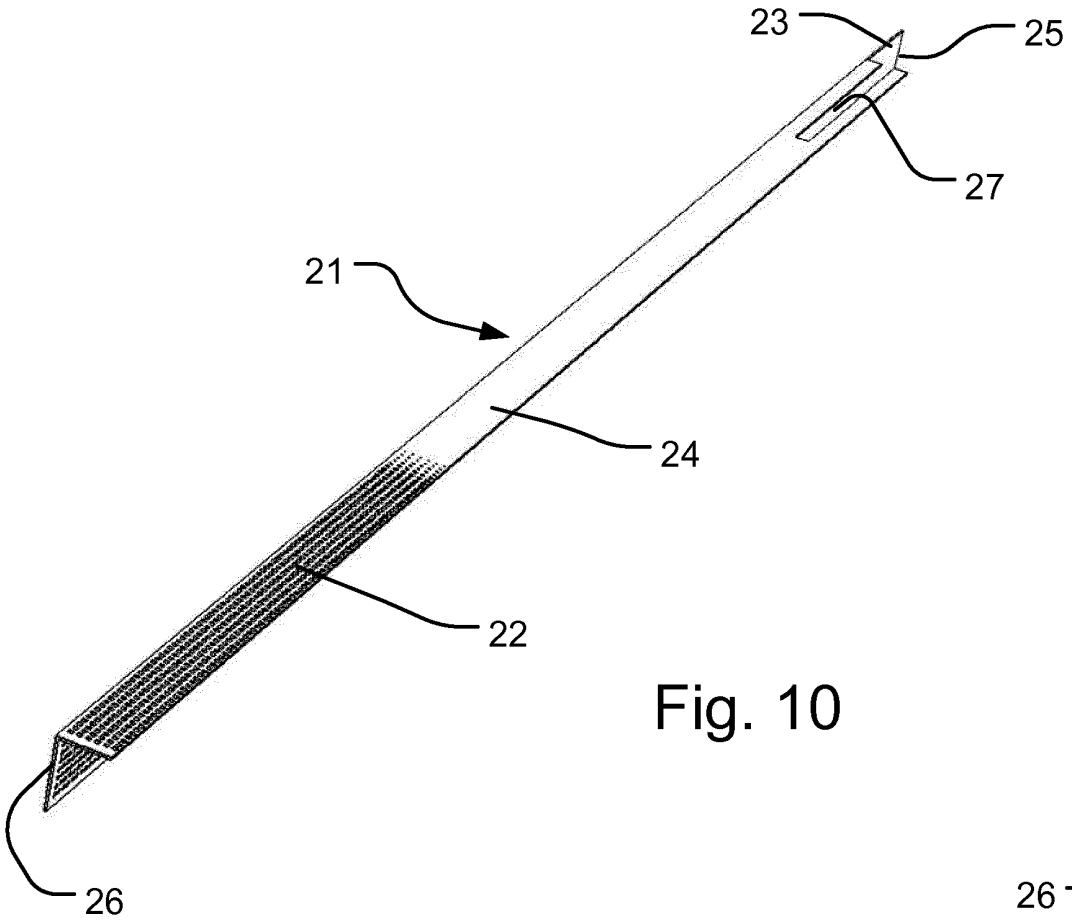


Fig. 10

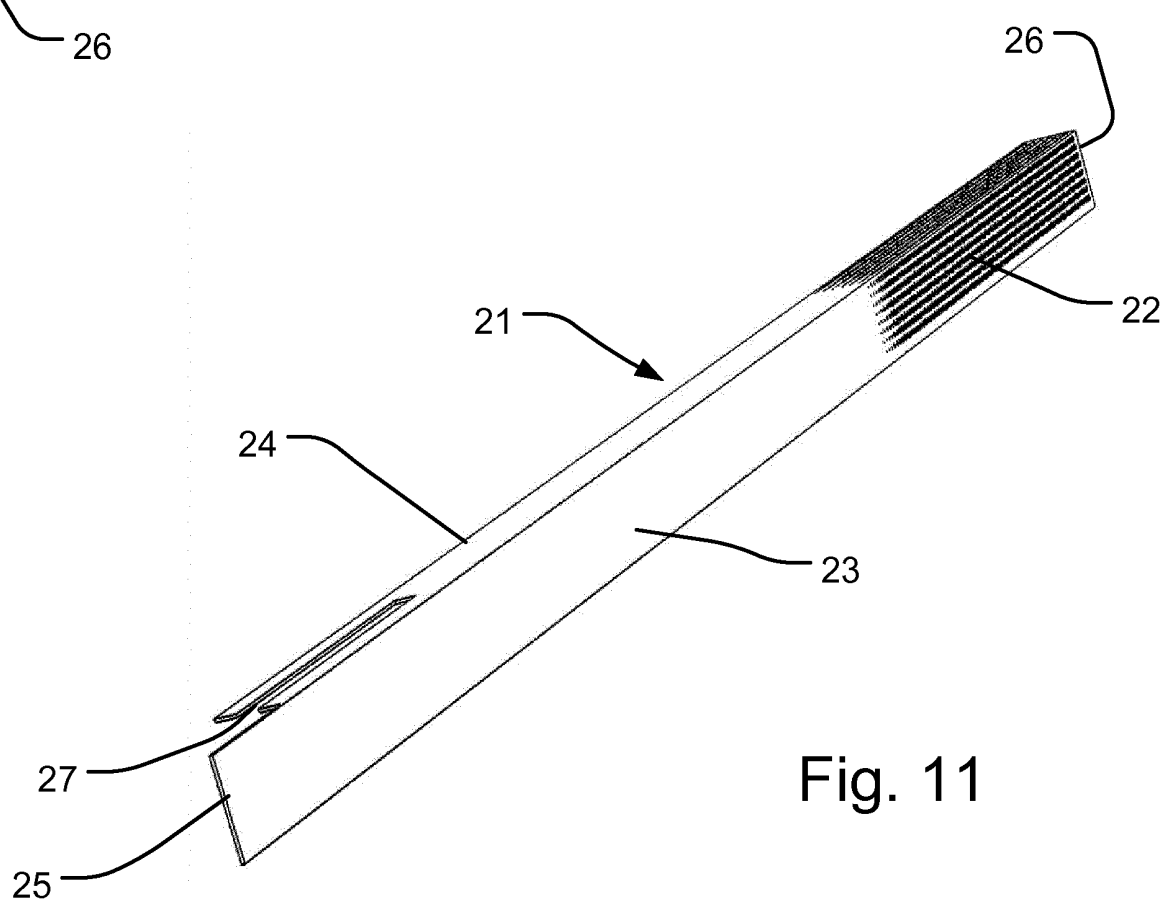


Fig. 11

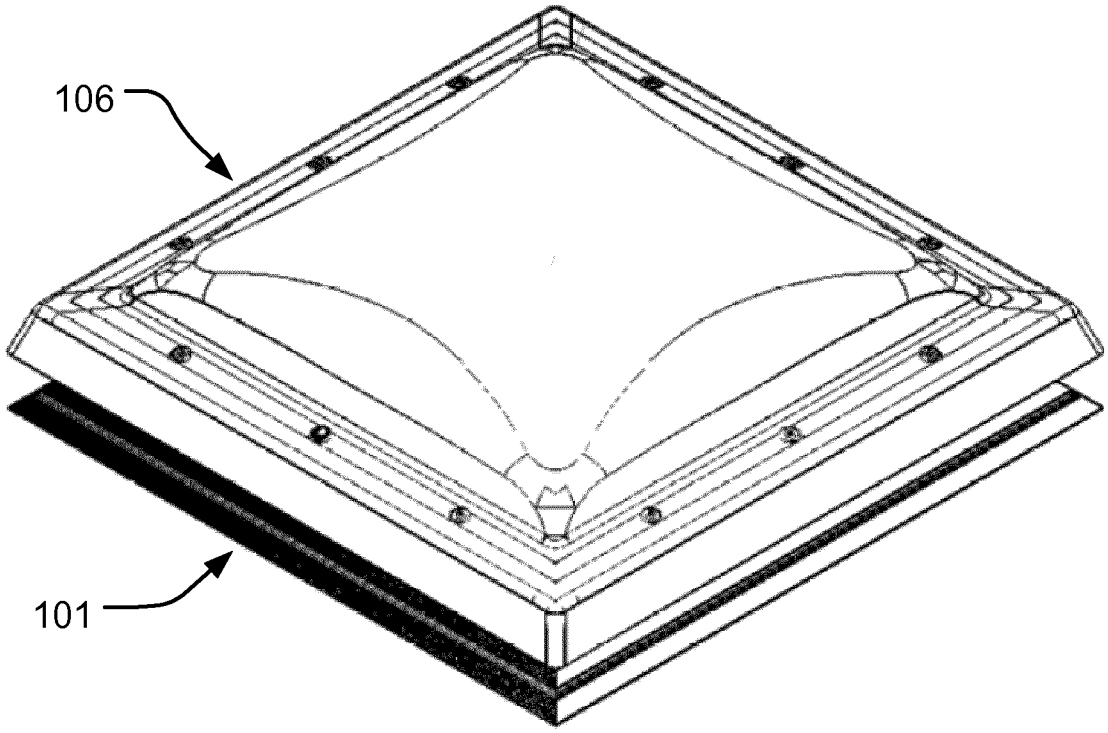


Fig. 12 (PRIOR ART)

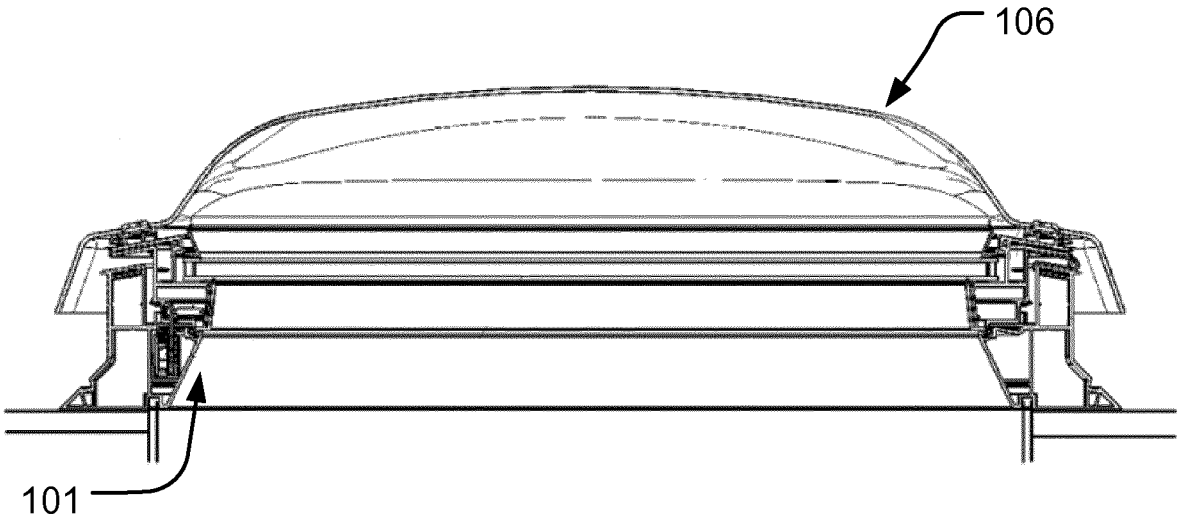


Fig. 13 (PRIOR ART)

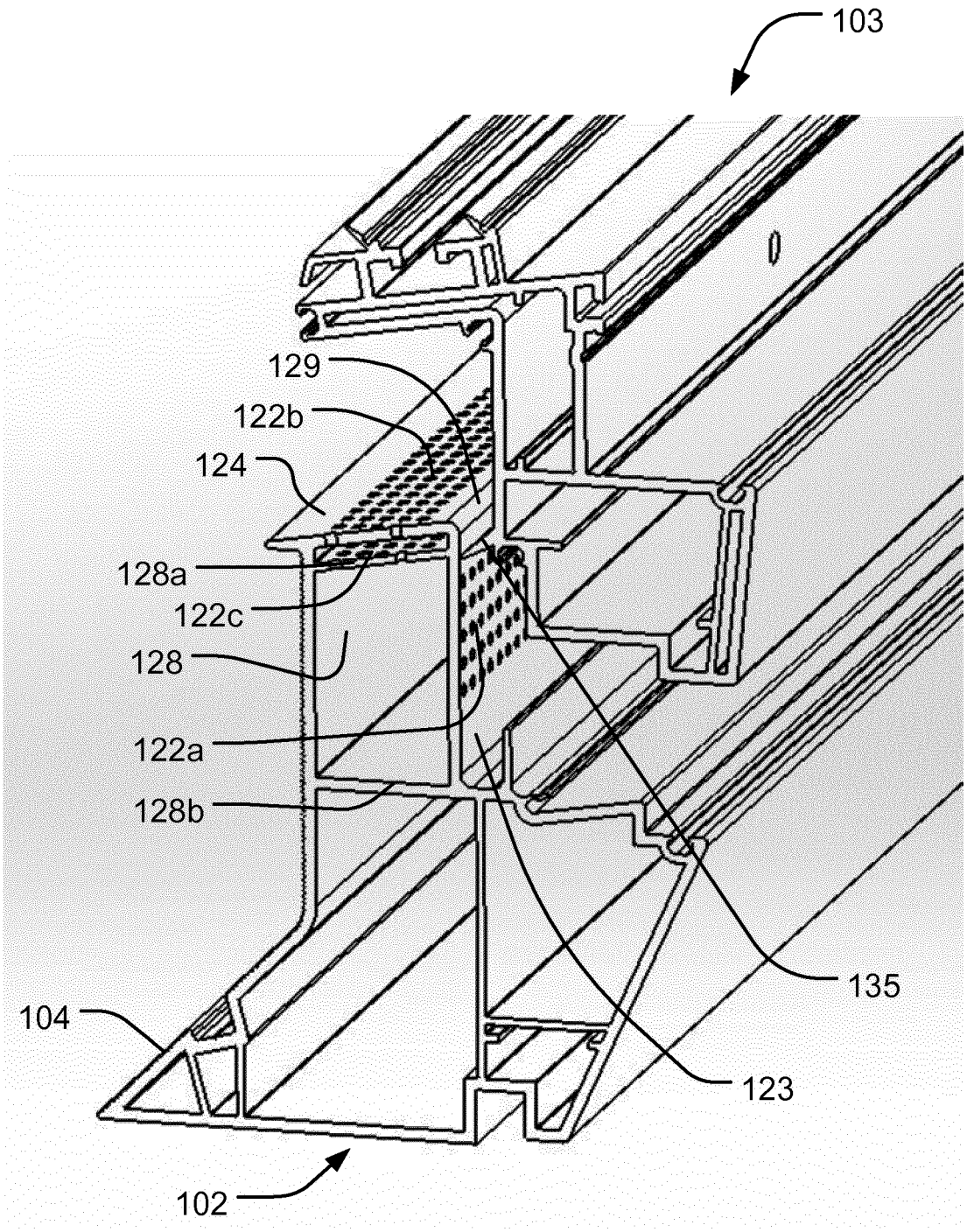


Fig. 14

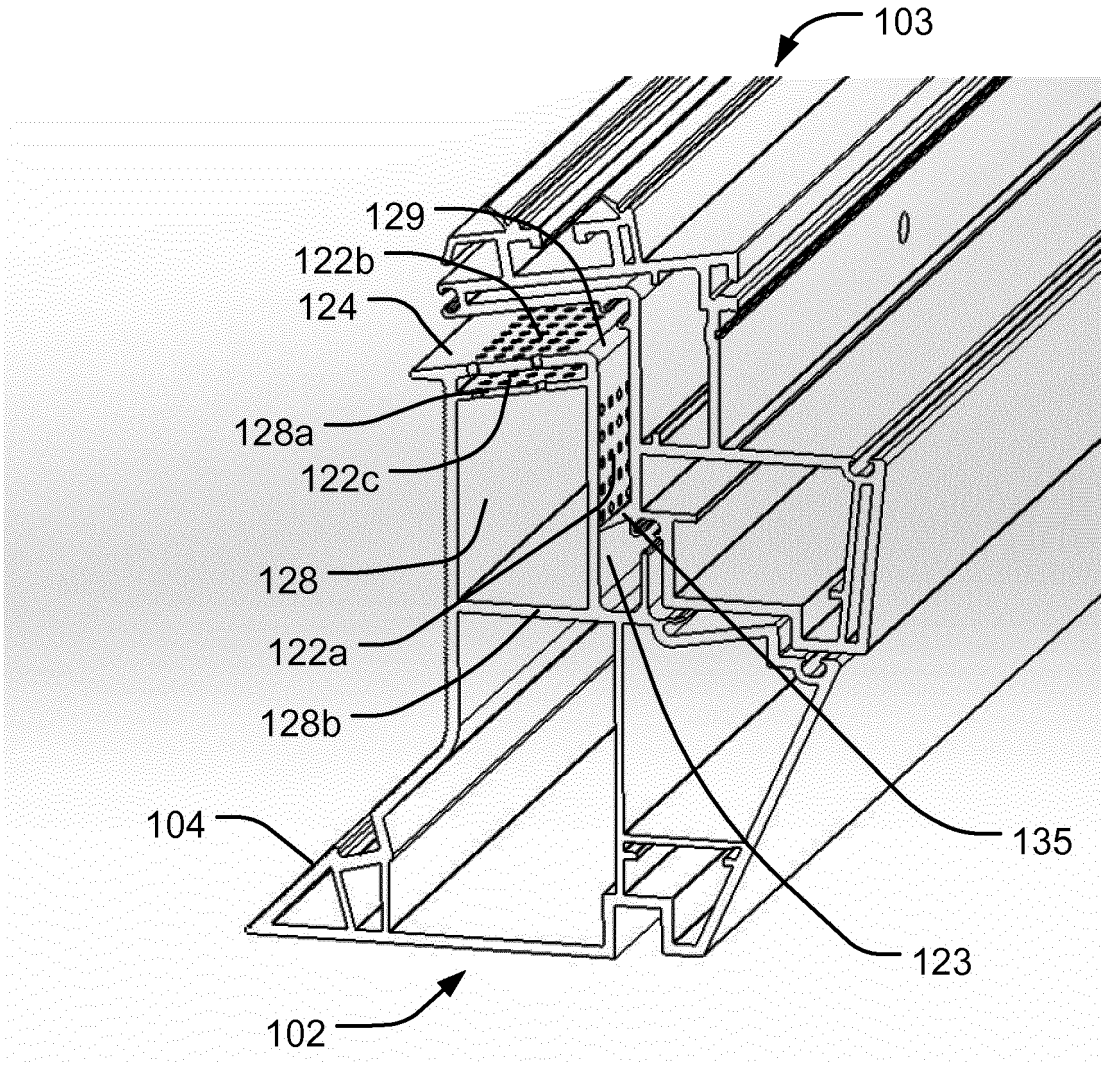


Fig. 15

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2005005762 A1 **[0004]**
- US 2311413 A **[0006]**
- US 1997206 A **[0006]**
- US 4969291 A **[0007]**
- DE 4218088 C1 **[0007]**
- WO 9534739 A1 **[0007]**
- DE 202008006531 U1 **[0007]**
- WO 2009080026 A1 **[0044]**