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(54) **VENTILATION GRILLE**

(57) The present invention relates to a ventilation grille (1), comprising:
- a base module (7), for placing on glass, having a base air flow passage (8);
- an acoustic add on module (10) which is couplable to the base module (7), which comprises an add on air flow passage (11) so as to form, together with the base air flow passage (8), an air flow passage (2) for natural air flow, and which is provided with an insert block (12) that is made from acoustically insulating material and that delimits the bottom of the add on air flow passage (11); and
- a self-adjusting valve (9) which is arranged in the base air flow passage (8).

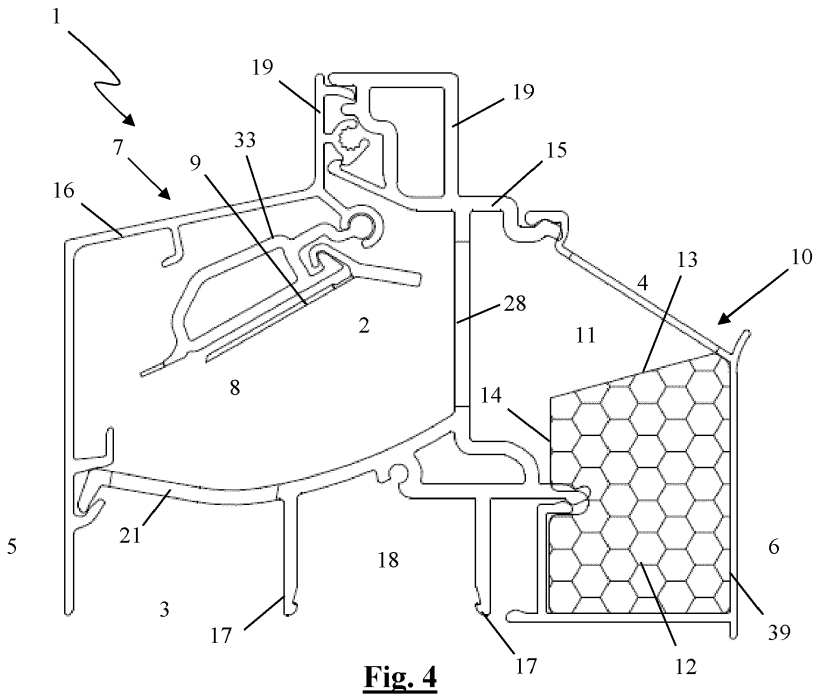

Fig. 4

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Description

[0001] The present invention relates to a ventilation grille for placing on glass, comprising:

- an air flow passage for natural air flow from an inlet opening to an outlet opening;
- a base module, for placing on the glass, having a base air flow passage which forms part of the air flow passage; and
- a self-adjusting valve which is arranged in the base air flow passage so as to be movable between a first extreme position and a second extreme position in order to adjust the air flow rate through the air flow passage as a function of the pressure difference across the self-adjusting valve.

[0002] Such ventilation grilles are provided for the natural supply of air to a building. Normally, air from an external environment is passed into the internal environment of the building via such ventilation grilles through the air flow passage.

[0003] By means of the self-adjusting valve, the air flow opening in the air flow passage is automatically adjusted, since the valve body of the self-adjusting valve moves automatically as a function of the pressure difference across the air flow passage, without the use of an actuator or motor. Due to the presence of such a self-adjusting valve, such a ventilation grille is also referred to as a self-adjusting ventilation grille. Examples of ventilation grilles with self-adjusting valves are known from EP 2 995 879 A1 and EP 3 312 521 A1 of the present applicant.
However, the ventilation grilles described and shown in those documents are not intended for placing on glass.

[0004] The ventilation grilles to which the present invention relates are intended to be placed directly on glazing in a wall. These ventilation grilles are then not placed above a window or door profile, but directly on the glazing, and may be incorporated along with this glazing in a window or door frame, between the glazing and a window or door profile.
In the case of ventilation grilles for placing on glass, there is much less space to integrate all of the desired technologies into such a ventilation grille than in the case of ventilation grilles which are incorporated above a window or door profile or in a wall itself.

[0005] Examples of ventilation grilles for placing on glass are known from NL 9 302 185 A and EP 1 096 097 A1 (embodiments in Figures 1 and 2). The ventilation grilles described and shown in these patent publications are provided with acoustically insulating material. Such acoustically insulating material is sound-absorbing. It is not possible to guarantee constant ventilation flow rates with these ventilation grilles. Ventilation flow rates that can be achieved with these ventilation grilles are in practice much lower than non-acoustic versions of such ventilation grilles. Although NL 9 302 185 A states that the air flow resistance is not adversely affected, the acoustic module described and shown therein has a significant effect on the ventilation flow rates.

[0006] The present applicant also previously developed a ventilation grille for placing on glass, which was provided with acoustically insulating material and which was sold under the name AK80GL. It was also not possible to achieve desired ventilation flow rates with that grille. In addition, that ventilation grille is relatively sizeable, which is regarded as not being very aesthetic.

[0007] In practice, acoustic ventilation grilles for placing on glass are barely used, since they are typically unable to achieve the desired ventilation flow rates or the ventilation grille has to be extended in such a way that it is regarded as not being very aesthetic.

[0008] The aim of the present invention is to provide such a ventilation grille for placing on glass, which is of acoustically insulating design, wherein the ventilation flow rate is not reduced to a significant extent with respect to comparable embodiments that are not of acoustically damping design, and which is still regarded as being aesthetic.

[0009] This aim of the invention is achieved by providing a ventilation grille for placing on glass, comprising:

- an air flow passage for natural air flow from an inlet opening to an outlet opening;
- a base module, for placing on the glass, having a base air flow passage which forms part of the air flow passage;
- a self-adjusting valve which is arranged in the base air flow passage so as to be movable between a first extreme position and a second extreme position in order to adjust the air flow rate through the air flow passage as a function of the pressure difference across the self-adjusting valve; and

- an acoustic add on module:

    - which is couplable to the base module;
    - which comprises an add on air flow passage that is intended to form part of the air flow passage and that is provided with the outlet opening; and
    - which is provided with an insert block that is manufactured from acoustically insulating material and that delimits the bottom of the add on air flow passage.

[0010] The outlet opening may form part of the add on module directly or for example form part of a grille which is couplable to this add on module.

[0011] The insert block may be of one-part or multi-part design. The material of this insert block is further preferably thermally insulating.

[0012] In the prior art of acoustic ventilation grilles for placing on glass, acoustically insulating material was always arranged at a location where the self-adjusting valve is now arranged. The acoustic material provided in

an insert block at a location behind the base air flow passage (with the self-adjusting valve) and at the bottom of the add on air flow passage will be impinged in a sufficient manner during through-flow to ensure acoustic damping. To this end, there must not be an excessive reduction in the ventilation flow rate. With the aid of the self-adjusting valve, constant ventilation flow rates can be ensured.

[0013] In a preferred embodiment, the outlet opening is provided so as to open the air flow passage towards the top.

[0014] By means of an outlet opening arranged in this manner, what is known as a Coanda effect is obtained. It is known practice to incorporate this Coanda effect in ventilation devices in order to reduce the risk of a feeling of draught and to obtain a better mixture of air coming into an interior space with the air already present in this interior space. By virtue of this specific placement of the outlet opening with respect to the insert block made of acoustically insulating material, air is deflected upwards as it flows through the air flow passage. In this way, this air at that point comes into contact with the acoustic material arranged at the bottom of the add on air flow passage. This also increases the acoustic action of this insert block.

[0015] The top surface of the insert block is preferably provided so as to delimit the bottom of the add on air flow passage.

[0016] This top surface is preferably designed to be as smooth as possible. It may be of flat design, but is preferably of curved design, in order to increase the possible contact surface between the air and the acoustic material. By increasing the contact surface, the acoustic action is also increased. This top surface preferably comprises as few abrupt transitions as possible. A top surface of curved design preferably comprises at most 2 bends.

[0017] The top surface of the insert block is further preferably designed to slope upward towards the outlet opening, at least in a zone adjoining said outlet opening, in order to further increase the damping action of the acoustic material.

[0018] Preferably, in this case the top surface in this zone is arranged at an angle of 45° to 89°, even more preferably to 85° and even more preferably to 60°, as seen with respect to a glass plane which is intended to extend in the plane of the glass in a mounted state.

[0019] As seen with respect to a lowest point of the insert block, the height of each point of the top surface preferably deviates by at most 60% from the height of that point of the top surface of the insert block which is intended to be arranged closest to the base module, such that air can flow through the air flow passage in as smooth a manner as possible and there is a sufficient volume of acoustically insulating material present at the bottom of the air flow passage to achieve the desired acoustic damping. In this case, the height of the highest point of the top surface preferably deviates by at most 57.5% from the height of that point of the top surface of the first insert block which is intended to be arranged closest to the base module. In this case, the lowest point of the top surface preferably deviates by at most 30%, and even more preferably by at most 25%, from that point of the top surface of the first insert block which is intended to be arranged closest to the base module.

[0020] The add on air flow passage comprises an add on inlet opening which is intended to adjoin a base outlet opening of the base air flow passage in a coupled state.

[0021] The top surface of the insert block is preferably intended to adjoin the bottom of this base outlet opening.

[0022] The top surface of the insert block is further preferably fixedly arranged in the ventilation grille.

[0023] In a specific embodiment, the insert block may comprise a front impingement surface which is able to be at least partially frontally impinged when air is flowing.

[0024] Contact sounds can be damped by means of such a front impingement surface. When the insert block comprises a said top surface and a said front impingement surface, this therefore makes it possible to damp not only shear sounds but also contact sounds.

[0025] At the self-adjusting valve, the air flow passage comprises a variable valve air flow opening which is adjustable between a minimum valve air flow opening (in the second extreme position) and a maximum valve air flow opening (in the first extreme position) by means of the self-adjusting valve. The air flow passage is further preferably constructed from air flow openings which deviate by at most 30%, more preferably by at most 25%, and even more preferably by at most 20%, from the maximum valve air flow opening, such that there is as little reduction in the air flow rate as possible.

[0026] In this case, the acoustic material is then provided in such a way that narrowed portions formed thereby never narrow the air flow opening by more than 30%, more preferably 25%, and even more preferably 20%, with respect to this maximum valve air flow opening.

[0027] The air flow passage further preferably extends, between the inlet opening and the outlet opening, substantially along a smooth line, which deviates from a rectilinear line.

[0028] Preferably, the add on air flow passage is further developed in such a way that when air flows through the add on air flow passage, this air moves substantially with a velocity, of which the component perpendicular to a glass plane, which is intended to extend in the plane of the glass in the mounted state, is greater than the component parallel to this glass plane.

[0029] Preferably, the add on air flow channel is provided in such a way that the air flow is substantially laminar when flowing therethrough.

[0030] The add on module is further preferably provided with a second insert block which is manufactured from acoustically insulating material and which delimits the top of the add on air flow passage, in order to obtain even better acoustic values.

[0031] The bottom surface of the second insert block is preferably provided so as to delimit the top of the add on air flow passage.

[0032] This bottom surface is preferably also designed to be as smooth as possible. It may be of flat design, but is preferably of curved design. This bottom surface comprises as few abrupt transitions as possible. A bottom surface of curved design preferably comprises at most 2 bends.

[0033] The second insert block may be of one-part or multi-part design.

[0034] The material of the second insert block is further preferably also thermally insulating. The bottom surface of the second insert block is preferably designed in a corresponding manner to the top surface of the first-mentioned insert block (hereinafter first insert block).

[0035] The first insert block is preferably provided in such a way that when the add on module is coupled to the base module, this first insert block extends into the base module.

[0036] The second insert block is preferably also provided in such a way that it extends into the base module in the coupled state of the add on module.

[0037] The add on air flow passage is further preferably free from partitions, in order to reduce air flow obstacles and to thus not unnecessarily reduce the ventilation flow rate.

The bottom and the top of the add on air flow passage are not connected to each other at the acoustic material fitted therein.

[0038] When the add on air flow passage is formed by a said first insert block and a said second insert block, these insert blocks are designed as separate insert blocks (which may consist of a plurality of parts) which are not connected to each other with the aid of partitions.

[0039] The ventilation grille further preferably comprises an outer profile which delimits the ventilation grille on a side facing away from the add on module, wherein this outer profile adjoining the air flow passage is provided with a third insert block which is manufactured from acoustically insulating material.

[0040] This outer profile may form part of the base module, or may be fastened to this base module.

The third insert block may be of one-part or multi-part design.

[0041] When the air flow passage extends, between the inlet opening and the outlet opening, along a smooth line, which deviates from a rectilinear line, and such a third insert block is provided, it is possible in a simple manner to ensure that sound waves cannot propagate along such a rectilinear line through the ventilation grille.

[0042] The material of the third insert block is further preferably also thermally insulating.

[0043] In a more specific embodiment, the self-adjusting valve is at least partially coated with or manufactured from acoustically insulating material.

[0044] The ventilation grille is further preferably provided with a fourth insert block which is manufactured from acoustically insulating material and which delimits the bottom of the base air flow passage, in order to increase the acoustic action even further.

[0045] This fourth insert block may be of one-part or multi-part design.

[0046] The material of the fourth insert block is further preferably also thermally insulating.

[0047] The path through the air flow passage is preferably obstructed as little as possible.

In addition, the outlet opening is preferably fixedly arranged in the add on module. The add on module is preferably free from movable components.

[0048] The air flow rate through the air flow passage is preferably only adjustable at the self-adjusting valve. To this end, the air flow rate is adjustable with the aid of this self-adjusting valve and may possibly be additionally adjustable with the aid of a shut-off valve that may be arranged at this self-adjusting valve. More specifically, to this end, the self-adjusting valve may be mounted on such a shut-off valve.

[0049] In a particularly preferred embodiment, the ventilation grille comprises a set of add on modules which are exchangeably couplable to the base module, wherein this set comprises said acoustic add on module. In addition to said acoustic add on module, such a set of add on modules preferably also comprises a Coanda module which is free from acoustically insulating material and which comprises an add on air flow passage that is intended to form part of the air flow passage and that is provided with an outlet opening so as to open the air flow passage towards the top. Depending on the requirements and circumstances, a ventilation grille for placing on glass which comprises a said base module may then be adapted, after placement, over time, by removing an existing add on module and replacing it with another add on module from said set comprising add on modules.

[0050] The present invention will now be explained in more detail by means of the following detailed description of some preferred embodiments of ventilation grilles according to the present invention. The sole aim of this description is to give illustrative examples and to indicate further advantages and features of the present invention, and can therefore not be interpreted as a limitation of the area of application of the invention or of the patent rights defined in the claims.

[0051] Reference numerals are used in this detailed description to refer to the attached drawings, in which:

- Figure 1 shows a base module of a ventilation grille according to the present invention separately in cross section;
- Figure 2 shows an add on module of a ventilation grille according to the present invention separately in cross section;
- Figure 3 shows a cross section of a ventilation grille made up of a set according to the present invention, with a Coanda module coupled to the base module from Figure 1;
- Figure 4 shows a cross section of a first embodiment of a ventilation grille according to the present invention, with the add on module from Figure 2 fastened

to the base module from Figure 1;

- Figure 5 shows a second embodiment of a ventilation grille according to the present invention in perspective and in an exploded view;
- Figure 6 shows a cross section of the ventilation grille from Figure 5;
- Figure 7 shows a cross section of a third embodiment of a ventilation grille according to the present invention;
- Figure 8 shows a cross section of a fourth embodiment of a ventilation grille according to the present invention.

[0052] The ventilation grilles (1) shown in the figures are each intended for placing on glass. As is known, to this end, these comprise several flanges (17) at the bottom which delimit a fitting opening (18) for the fitting of glazing therein. These comprise upright flanges (19) at the top and to the side in order to be able to be incorporated along with the glazing in a window or door frame.

[0053] As an alternative, these may then also be fastened to a crossmember or soffit.

[0054] The ventilation grilles (1) each comprise an air flow passage (2) for natural air flow from an inlet opening (3) to an outlet opening (4). In this way, air can be supplied from an external environment (5) to an internal environment (6).

[0055] A respective self-adjusting valve (9) is arranged in the air flow passage (2). This self-adjusting valve (9) is provided so as to be movable between a first extreme position and a second extreme position in order to adjust the air flow rate through the air flow passage (2) as a function of the pressure difference across the self-adjusting valve (9). The air flow rate through the air flow passage (2) is in each case only adjustable with the aid of this self-adjusting valve (9).

[0056] Each of the shown ventilation grilles (1) according to the invention comprises a base module (7) and an acoustic add on module (10) which is couplable thereto.

[0057] In order to couple the acoustic add on module (10) to the base module (7), in the embodiments shown, the base module (7) comprises hook-on legs (34) in a known manner. The add on module (10) comprises corresponding hook-on legs (35, 36). In this way, the add on module (10) can be fastened to the base module (7) by tilting the add on module (10) upwards with respect to the base module (7), hooking the upper hook-on leg (35) of the add on module (10) at the top of the upper hook-on leg (34) of the base module (7) and then tilting the add on module (10) downwards again in order to hook the lower hook-on leg (36) of the add on module (10) behind the lower hook-on leg (34) of the base module (7), thereby simultaneously producing a click-fit connection between both hook-on legs.

[0058] The ventilation grilles (1) according to the invention may form part of a set, which may additionally comprise, for example, a Coanda module (20) as shown in Figure 3. The acoustic add on module (10) and the Coanda module (20) are then exchangeably fastenable to the base module (7). In this case, the Coanda module (20) is provided with corresponding hook-on legs (35, 36) by means of which it is couplable to the base module (7) in the same manner as the add on module (10). The Coanda module (20) is further provided with an add on air flow passage (22) which is intended to form part of the air flow passage (2) and which is provided with an outlet opening (23) so as to open the air flow passage (2) towards the top.

[0059] Just like in the prior art in which a cover cap or add on module can be coupled to a base module in a variety of different ways (see, for example, NL 9 302 185 A and EP 1 096 097 A1), it is also possible here for the base module (7), add on module (10) and Coanda module (20) to be provided with alternative fastening means for coupling these modules (7, 10, 20) to each other.

[0060] The base module (7) in each case comprises a base air flow passage (8) which forms part of the air flow passage (2) of the ventilation grille (1). In the embodiments shown, this base module (7) is in each case constructed from a glass profile (15) and an outer profile (16) which is fastened thereto. The glass profile (15) and the outer profile (16) both extend substantially in a longitudinal direction and are shut off at the end thereof by means of a cover cap (37). In alternative embodiments, this base module (7) may also be constructed from a single profile or from a plurality of profiles.

[0061] On the side of the inlet opening (3), the glass profile (15) is provided with perforations which together form a base inlet opening (21) to the base air flow passage (8). On the side of the coupling legs (34), perforations are also provided which together form a base outlet opening (28) so as to allow air to flow from the base air flow passage (8) in the direction of the add on module (10) or the Coanda module (20).

[0062] The self-adjusting valve (9) is hingeably arranged in the base air flow passage (8) in order for it to be movably arranged in the air flow passage (2).

[0063] To this end, in the embodiments shown, the self-adjusting valve (9) is suspended on a shut-off valve (33) which is movable, with the aid of a lever with transmission means (40), between the first extreme position shown in the figures for optimal ventilation action of the ventilation grille (1) and a second extreme position for shutting off the air flow passage (2). Just like in the prior art (see, for example, EP 2 995 879 A1 and EP 3 312 521 A1), it is however also possible for such a self-adjusting valve (9) to be movably arranged in the air flow passage (2) in many other ways, it not being necessary to provide such a shut-off valve (33) for this purpose.

[0064] The add on module (10) in each case comprises an elongated profile (39) which is protected at its ends by means of a cover cap (38). Each of the acoustic add on modules (10) shown comprises an add on air flow passage (11) which is intended to form, together with the base air flow passage (8), the air flow passage (2). To this end, adjoining the base air flow opening (28), the add

on module (10) comprises an add on inlet opening (27) and the add on module (10) is provided, in the direction of the internal environment (6), with perforations (4) so as to form the outlet opening (4) of the air flow passage (2).

[0065] In alternative embodiments, the air flow passage (2) may also be constructed from a plurality of parts.

[0066] In the first, simplest embodiment, as shown in Figure 4, the add on module (10) is only provided with a first insert block (12). The top surface (13) of this first insert block (12) delimits the bottom of the add on air flow passage (11), while the profile (39) of the add on module (10) delimits the top of the add on air flow passage (11).

[0067] In the other embodiments shown, as shown in Figures 5-8, the add on module (10) is additionally also provided with a second insert block (24), the bottom surface (30) of which delimits the top of the add on air flow passage (11).

[0068] Furthermore, in these embodiments, the outer profile (16) is provided with a third insert block (25), the bottom surface (31) of which delimits the top of the base air flow passage (8).

[0069] In the second embodiment (Figures 5 and 6) and in the fourth embodiment (Figure 8), a fourth insert block (29) is additionally also provided in the base module (7). The top surface (32) of this fourth insert block (29) delimits the bottom of the base air flow passage (8).

[0070] The insert blocks (12, 24, 25, 29) are each manufactured from acoustically insulating material. These insert blocks (12, 24, 25, 29) are also of thermally insulating design in this case. To this end, these insert blocks (12, 24, 25, 29) may be manufactured from the same or comparable sound-absorbing materials as in the prior art.

[0071] Just like in the prior art, the insert blocks (12, 24, 25, 29) may be fastened in the ventilation grille (1) in various ways. This is preferably effected in such a way that these insert blocks (12, 24, 25, 29) are removable for the purpose of maintenance.

[0072] In the embodiments shown, the insert blocks (12, 24, 25, 29) are provided with grooves (42) in order to hook them around and/or with respect to protruding ribs (41) of profiles (15, 16, 39) of the ventilation grille (1).

[0073] In the third embodiment, the first insert block (12) and the second insert block (24) also form part of the same block of acoustically insulating material, which is provided with perforations so that the first insert block (12) and the second insert block (24) are connected to each other by means of partitions made of this acoustic material. In the second and the fourth embodiment, the first insert block (12) and the second insert block (24) are not connected to each other in such a manner and the add on air flow passage (11) is free from such partitions, such that the ventilation flow rate can be increased.

[0074] As an alternative, the insert blocks (12, 24, 25, 29) may, for example, be adhesively bonded to such profiles.

[0075] The outlet opening (4) opens the air flow passage (2) towards the top in each case. Not only is a Coanda effect obtained, but the air in the add on air flow passage (11) is also deflected, such that said air is readily able to come into contact with the acoustically insulating material. To this end, the top surface (13) of the first insert block (12) is in each case also designed to slope upward towards this outlet opening (4) in a zone adjoining this outlet opening (4), such that it is arranged adjoining the outlet opening (4) at an angle (α) with respect to the glass plane (A), in order to ensure maximum contact with this acoustically insulating material. To this end, in the first embodiment (α) is 75°, in the second and the fourth embodiment (α) is 50°, and in the third embodiment (α) is 85°.

[0076] In the first and the third embodiment, the top surface (13) of the first insert block (12) is of flat design. In order to further increase the contact surface between air flowing through the add on air flow passage (11) and the acoustic material, the top surface (13) of the first insert block (12) is preferably of curved design, as in the second and the fourth embodiment.

[0077] Abrupt transitions in this top surface (13) are preferably limited.

[0078] As seen with respect to a lowest point (O) of the first insert block (12), the height (H_T, H_U) of each point of the top surface (13) of this insert block (12) therefore deviates in each case by at most 60% from the height (H_I) of that point of the top surface (13) of the first insert block (12) which is intended to be arranged closest to the base module (7). In this case, the highest point (H_U) of this top surface (13) preferably deviates by at most 57.5% from the height (H_I) of that point of the top surface (13) of the first insert block (12) which is intended to be arranged closest to the base module (7). In this case, the lowest point (H_T) of the top surface (13) preferably deviates by at most 30%, and even more preferably by at most 25%, from this point (H_I). A sufficient volume of acoustically insulating material is therefore arranged at the bottom of the add on air flow passage (11) to be able to achieve desired acoustic damping.

[0079] Furthermore, the number of bends in the top surface (13) of the first insert block (12) is kept limited in each case.

[0080] The air flow passage (2) in each case extends, between the inlet opening (3) and the outlet opening (4), substantially along a smooth line, which deviates from a rectilinear line.

[0081] The add on air flow passage (11) is further developed in each case in such a way that when air is flowing, the air moves substantially with a velocity (v), of which the component (v_H) perpendicular to a glass plane (A), which is intended to extend in the plane of the glass in the mounted state, is greater than the component (vv) parallel to this glass plane (A).

[0082] In the first, simplest embodiment shown (Figure 4), the first insert block (12) is provided with a front impingement surface (14) which is able to be at least partially frontally impinged when air is flowing.

[0083] In the other embodiments, the first insert block

(12) extends into the base module (7) in the coupled state of the add on module (10). In the embodiments shown, the top surface (13) always adjoins the bottom of the base outlet opening (28) so as to generate as little turbulence as possible upstream of this first insert block (12) and to avoid the accumulation of dust upstream of the insert block (12).

[0084] In the third embodiment, the second insert block (24) also extends into the base module (7) in the coupled state of the add on module (10).

[0085] In order to not unnecessarily reduce the ventilation flow rate through the add on air flow passage (11), the latter is constricted as little as possible. In the second, third and fourth embodiment shown, the bottom surface (30) of the second insert block (24) is therefore designed in a corresponding manner to the top surface (13) of the first insert block (12). In addition, the air flow passage (2) is in each case constructed from air flow openings which deviate by at most 30%, preferably by at most 25%, and even more preferably by at most 20%, from the maximum valve air flow opening. This valve air flow opening is that through-flow opening in the air flow passage at the self-adjusting valve which is adjustable between a minimum valve air flow opening (in the second extreme position) and a maximum valve air flow opening (in the first extreme position).

Claims

1. Ventilation grille (1) for placing on glass, comprising:

- an air flow passage (2) for natural air flow from an inlet opening (3) to an outlet opening (4);
- a base module (7), for placing on the glass, having a base air flow passage (8) which forms part of the air flow passage (2); and
- a self-adjusting valve (9) which is arranged in the base air flow passage (8) so as to be movable between a first extreme position and a second extreme position in order to adjust the air flow rate through the air flow passage (2) as a function of the pressure difference across the self-adjusting valve (9);

characterized in that the ventilation grille (1) comprises an acoustic add on module (10):

- which is couplable to the base module (7);
- which comprises an add on air flow passage (11) that is intended to form part of the air flow passage (2) and that is provided with the outlet opening (4); and
- which is provided with an insert block (12) that is manufactured from acoustically insulating material and that delimits the bottom of the add on air flow passage (11).

2. Ventilation grille (1) according to Claim 1, **characterized in that** the outlet opening (4) is provided so as to open the air flow passage (2) towards the top.

3. Ventilation grille (1) according to either one of the preceding claims, **characterized in that** the insert block (12) comprises a top surface (13) which delimits the bottom of the add on air flow passage (11), wherein, as seen with respect to a lowest point (O) of the insert block (12), the height (H_T, H_U) of each point of the top surface (13) deviates by at most 60% from the height (H_I) of that point of the top surface (13) of the insert block (12) which is intended to be arranged closest to the base module (7).

4. Ventilation grille (1) according to Claims 2 and 3, **characterized in that** the top surface (13) is designed to slope upward towards the outlet opening (4), at least in a zone adjoining the outlet opening (4).

5. Ventilation grille (1) according to Claim 3 or 4, **characterized in that** the add on air flow passage (11) comprises an add on inlet opening (27) which is intended to adjoin a base outlet opening (28) of the base air flow passage (8) in a coupled state, and **in that** the top surface (13) is intended to adjoin the bottom of the base outlet opening (28).

6. Ventilation grille (1) according to one of the preceding claims, **characterized in that** the insert block (12) comprises a front impingement surface (14) which is able to be at least partially frontally impinged when air is flowing.

7. Ventilation grille (1) according to one of the preceding claims, **characterized in that**, at the self-adjusting valve (9), the air flow passage (2) comprises a variable valve air flow opening which is adjustable between a minimum valve air flow opening and a maximum valve air flow opening by means of the self-adjusting valve (9), and **in that** the air flow passage (2) is also constructed from air flow openings which deviate by at most 30% from the maximum valve air flow opening.

8. Ventilation grille (1) according to one of the preceding claims, **characterized in that** the air flow passage (2) extends, between the inlet opening (3) and the outlet opening (4), substantially along a smooth line, which deviates from a rectilinear line.

9. Ventilation grille (1) according to one of the preceding claims, **characterized in that** the add on air flow passage (11) is developed in such a way that when air flows through the add on air flow passage (11), this air moves substantially with a velocity (v), of which the component (v_H) perpendicular to a glass plane (A), which is intended to extend in the plane

of the glass in a mounted state, is greater than the component (vv) parallel to this glass plane (A).

10. Ventilation grille (1) according to one of the preceding claims, **characterized in that** the ventilation grille (1) is provided with a second insert block (24) which is manufactured from acoustically insulating material and which delimits the top of the add on air flow passage (11).

11. Ventilation grille (1) according to one of the preceding claims, **characterized in that** when the add on module (10) is coupled to the base module (7), the first insert block (12) and/or the second insert block (24) extends into the base module (7).

12. Ventilation grille (1) according to one of the preceding claims, **characterized in that** the ventilation grille (1) comprises an outer profile (16) which delimits the ventilation grille (1) on a side facing away from the add on module (10), and **in that** this outer profile (16) adjoining the air flow passage (2) is provided with a third insert block (25) which is manufactured from acoustically insulating material.

13. Ventilation grille (1) according to one of the preceding claims, **characterized in that** the air flow rate through the air flow passage (2) is only adjustable at the self-adjusting valve (9).

14. Ventilation grille (1) according to one of the preceding claims, **characterized in that** the ventilation grille (1) comprises a set of add on modules (10, 20) which are exchangeably couplable to the base module (7), wherein this set (10, 20) comprises said acoustic add on module (10).

15. Ventilation grille (1) according to Claim 14, **characterized in that** the set of add on modules (10, 20) comprises a Coanda module (20) which is free from acoustically insulating material and which comprises an add on air flow passage (22) that is intended to form part of the air flow passage (2) and that is provided with an outlet opening (23) so as to open the air flow passage (2) towards the top.

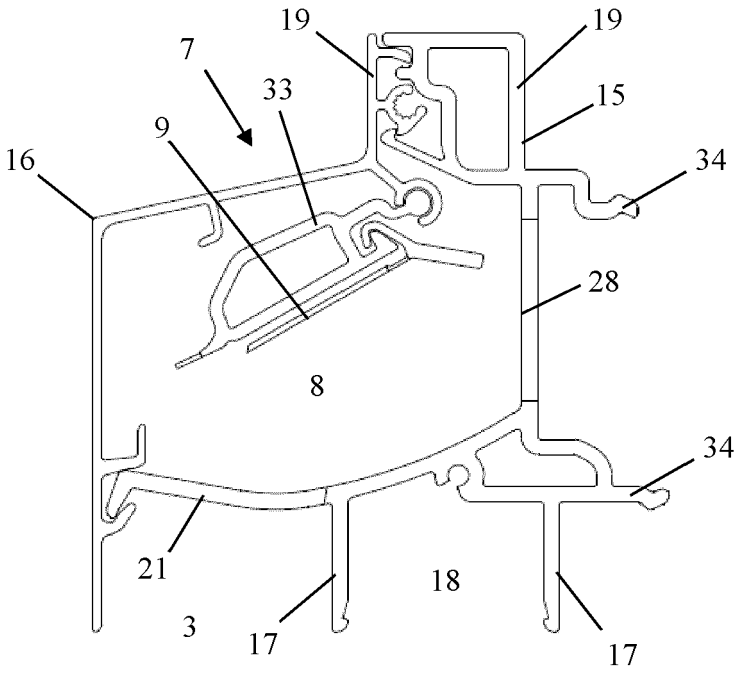


Fig. 1

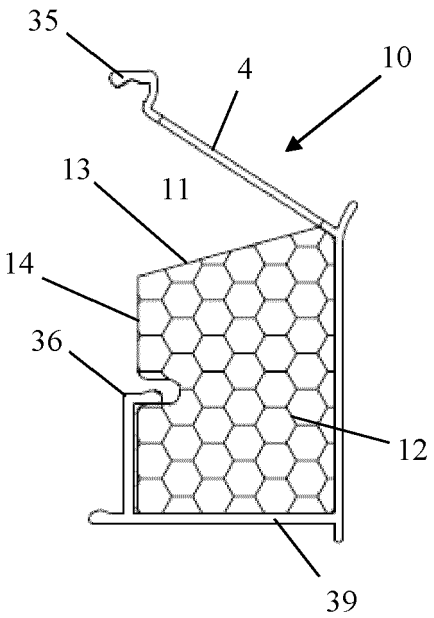
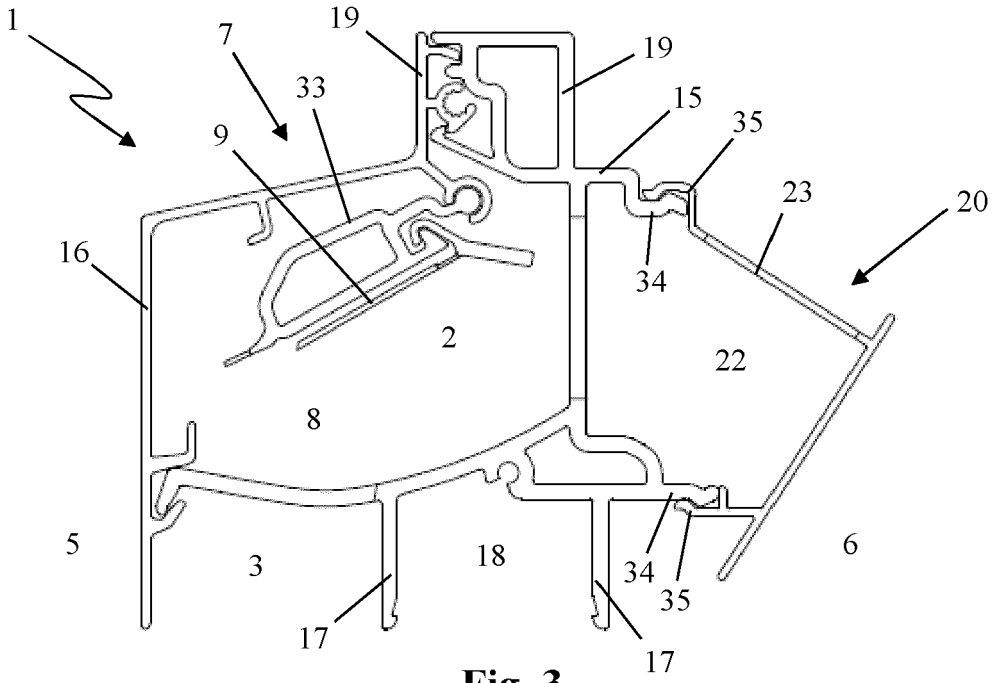


Fig.2



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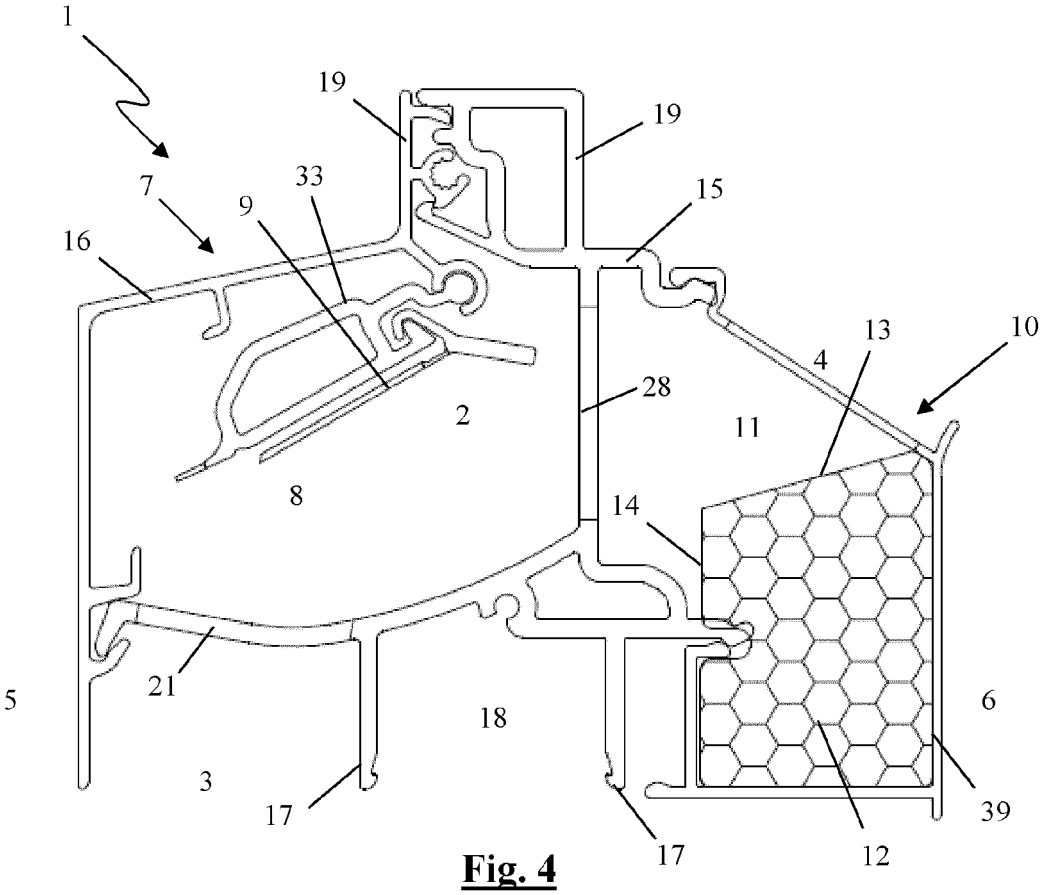
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Fig. 4

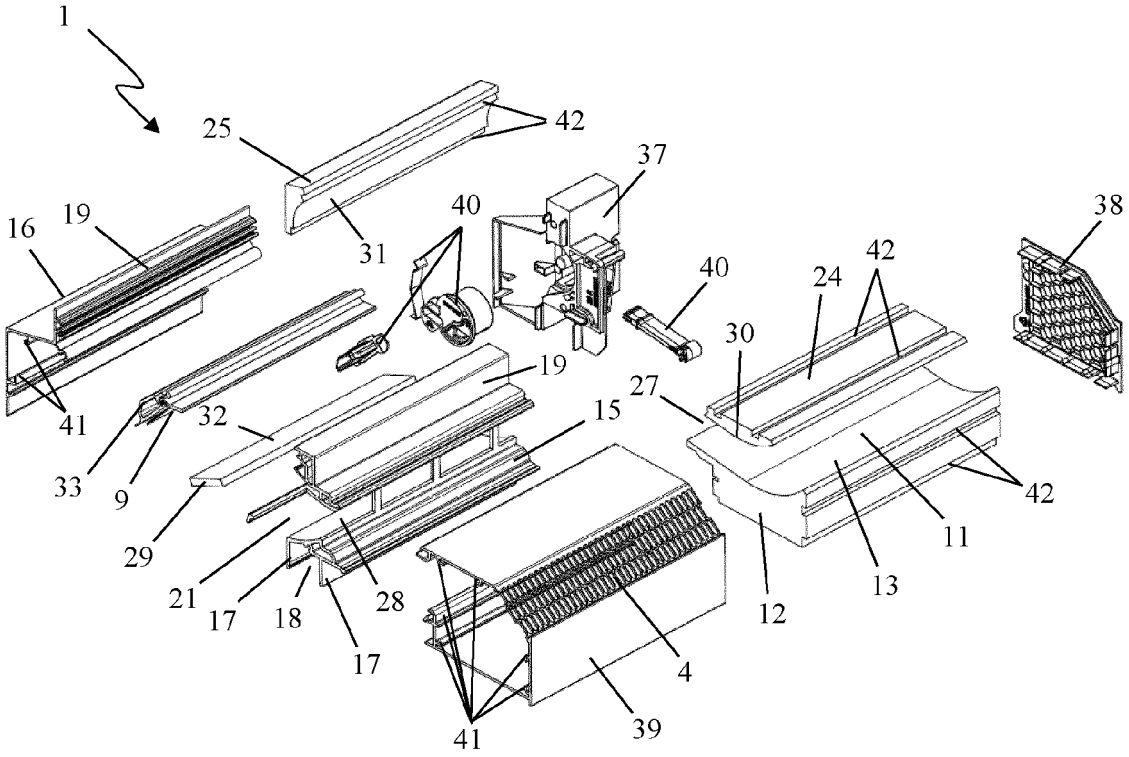
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Fig. 5

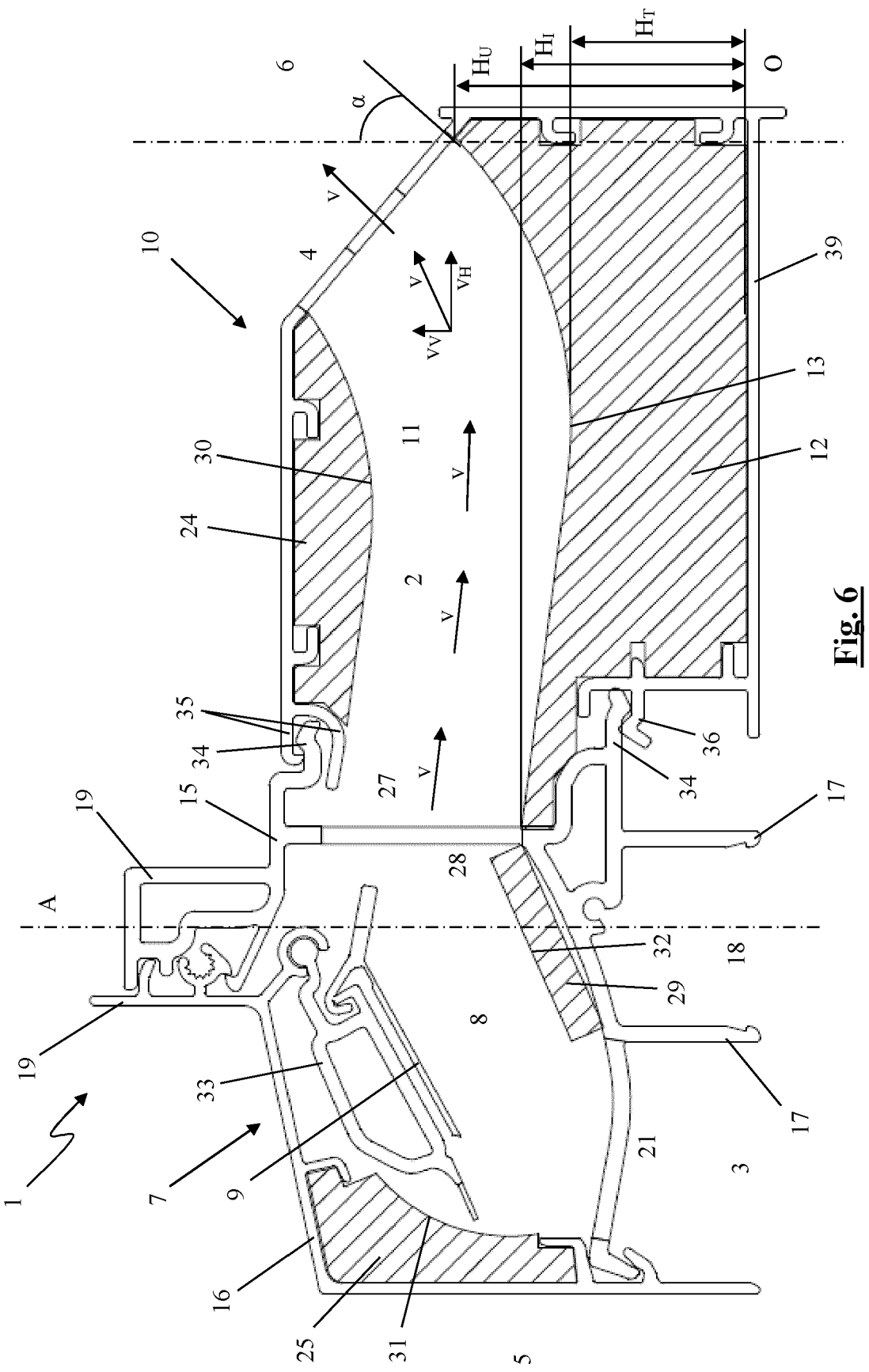
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Fig. 6

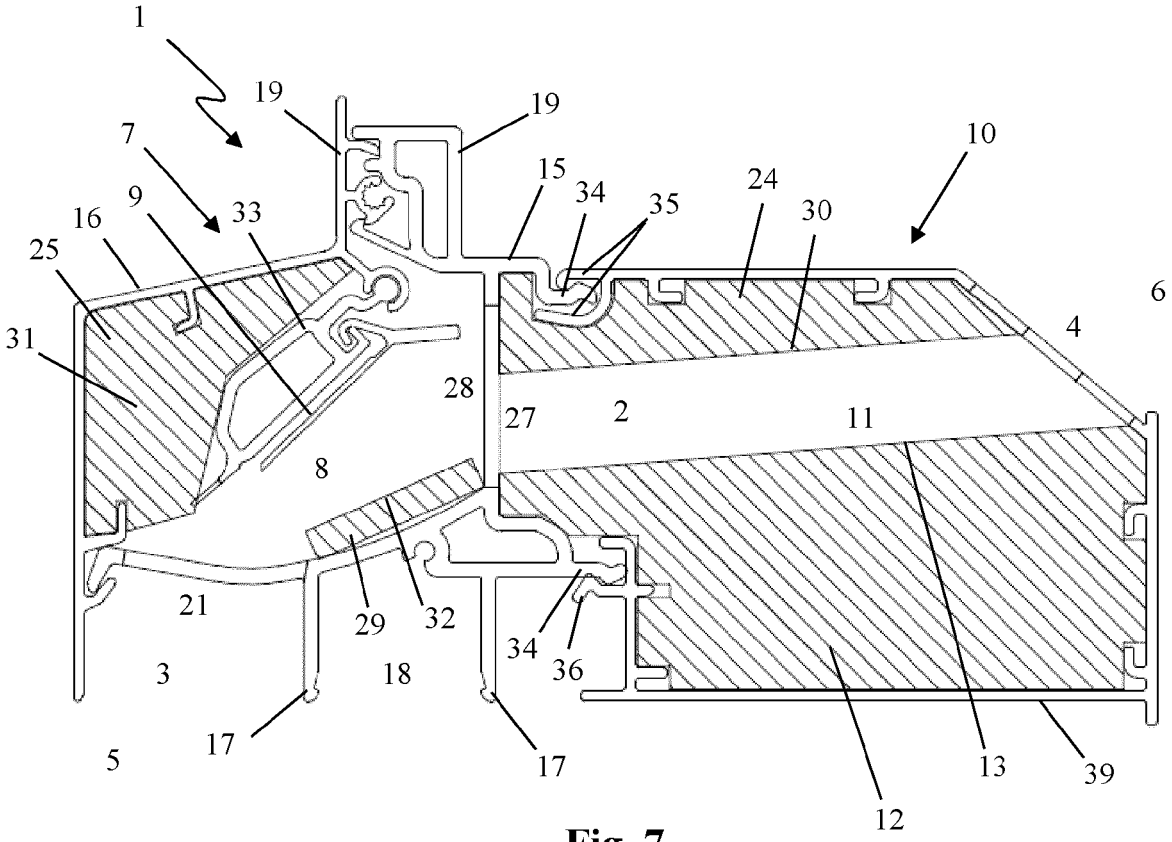
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Fig. 7

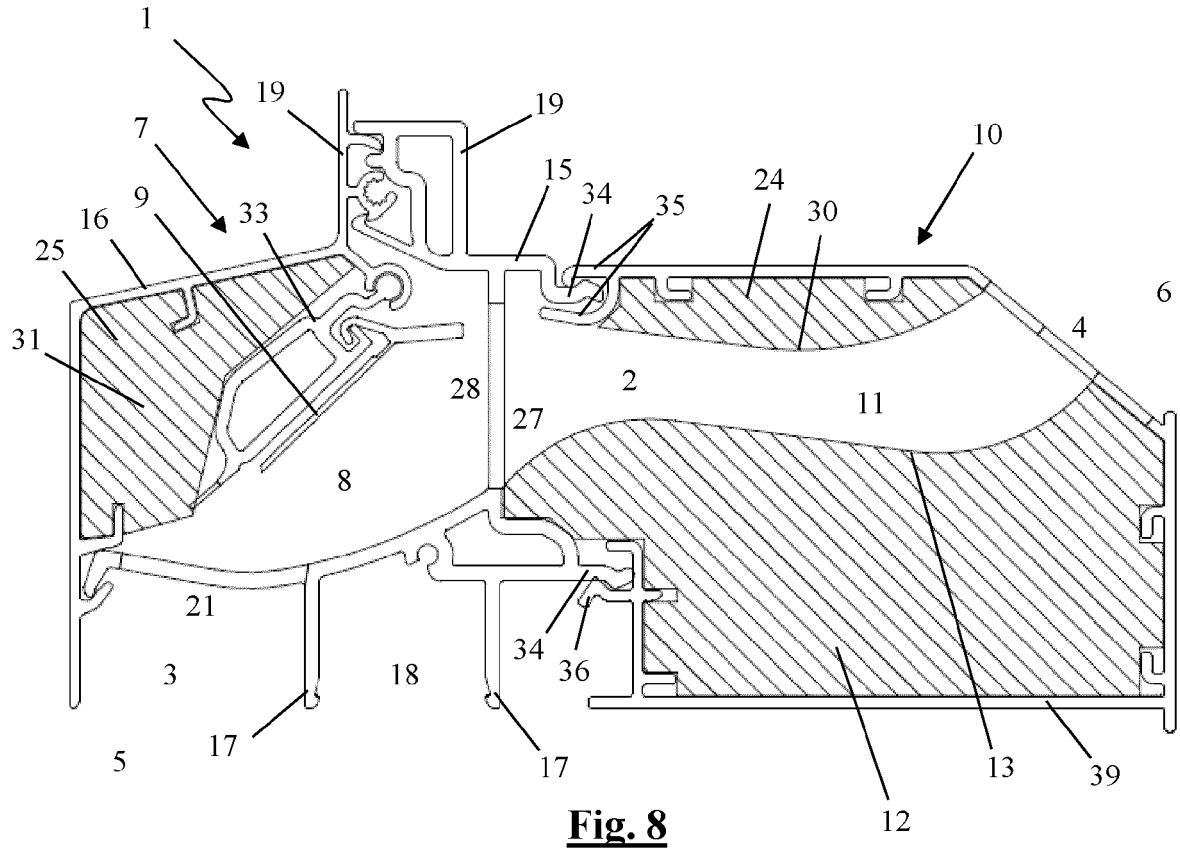
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Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 23 17 4878

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC) E06B F24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	21 September 2023	Cornu, Olivier

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21-09-2023

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