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(72) Inventors:
• **Meinster, John Peter**
9050 GENTBRUGGE (BE)
• **De Neve, Marnix Dominique Maurice Alberic**
9880 AALTER (BE)

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(74) Representative: **Hostens, Veerle et al**
KOB NV
Patents
President Kennedypark 31 C
8500 Kortrijk (BE)

(71) Applicant: **Renson Ventilation NV**
8790 Waregem (BE)

(54) **Housing structure for a screen device**

(57) The present invention relates to a strong housing structure for a screen device (1) for fitting in a door or window opening in a wall, comprising a bottom profile (2) and a top profile (3) having a space in between for a screen roller (4) and next thereto and at least partly in a zone above the frame (25), within the width of the frame

(25), an upright wall (6, 7) which is rigidly and detachably connected to these profiles (2, 3), and is provided with one or more openings (38) and is substantially configured as a framework structure (7) next to these openings (38) for transferring loads between the frame (25) and the wall.

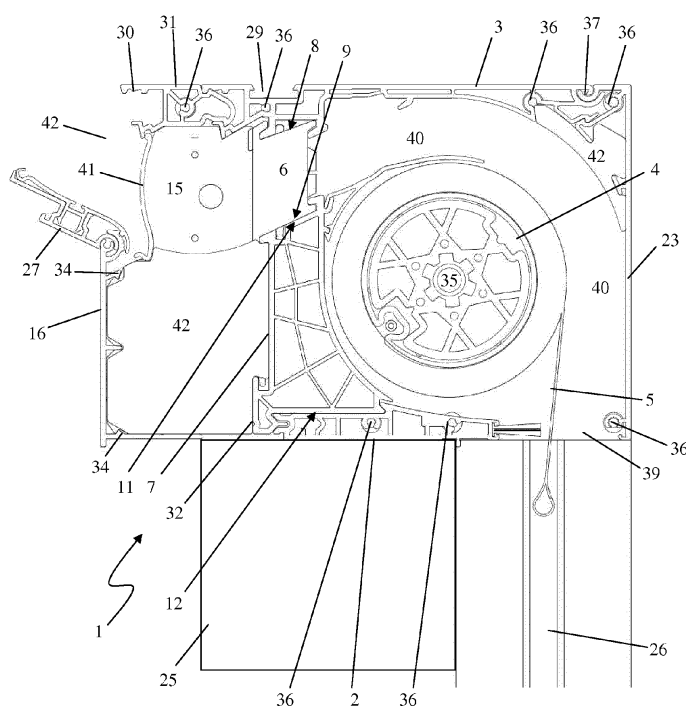


FIG. 1

Description

[0001] The present invention relates to a housing structure for a screen device for fitting in a door or window opening in a wall, adjacent to a door or window frame which is arranged in this door or window opening, comprising

- a bottom profile for fastening the housing structure to the top of the frame;
- a top profile for fastening the housing structure to the wall at the top side of the opening, wherein a space extends between the bottom profile and the top profile for arranging a screen roller of the screen device therein on which a screen of the screen device can be rolled up and unrolled in order to cover the opening;
- an upright wall which is arranged next to said space, extends between the bottom profile and the top profile and is detachably connected to the bottom profile and the top profile, so that a passage opening for fitting or removing the screen roller is made accessible when detaching the upright wall and wherein this upright wall is provided with one or more openings which form a passage through this upright wall in a direction perpendicular to the plane of the frame.

[0002] In this case, the term screen is understood to mean both a screen made of cloth and a screen made of roller shutter. The term screen device is then understood to mean both a roller cloth device and a roller shutter device.

[0003] A door or window frame is the framework in which a door or a window is typically fitted.

[0004] Said one or more openings are typically, but without being limited thereto, ventilation openings for providing ventilation through the upright wall and through the door or window opening.

[0005] Such a housing structure is described and illustrated, for example, in BE 1 015 475 A5.

[0006] As described in NL 1 031 803 A1, housing structures for screen rollers which also have to be provided with a ventilation passage have the significant drawback that they are, in practice, insufficiently well adapted to absorb loads which are exerted on the frame and are transferred to the wall. NL 1 021 803 A1 proposes fitting coupling elements between the top profile and the bottom profile in the plane of the frame in order to better be able to absorb the loads which occur between the frame and the wall. Ventilation air can flow freely between these coupling elements to the ventilation grille which is provided in the upright wall at a distance from these coupling elements. In practice, however, it is found that this solution by means of coupling elements does not always suffice either.

[0007] Until now, no solutions have been found which offer, on the one hand, a sufficiently strong connection in order to ensure the desired transfer of forces between

the frame and the wall and, on the other hand, do not completely close off the space between the top profile and the bottom profile in the plane of the frame.

[0008] It is therefore an object of the present invention to provide a solution therefor.

[0009] This object of the invention is achieved by providing a housing structure for a screen device for fitting in a door or window opening in a wall, adjacent to a door or window frame which is arranged in this door or window opening, comprising:

- a bottom profile for fastening the housing structure to the top of the frame;
- a top profile for fastening the housing structure to the wall at the top side of the opening, wherein a space extends between the bottom profile and the top profile for arranging a screen roller of the screen device therein on which a screen of the screen device can be rolled up and unrolled in order to cover the opening;
- an upright wall which is arranged next to said space, extends between the bottom profile and the top profile and is detachably connected to the bottom profile and the top profile, so that a passage opening for fitting or removing the screen roller is made accessible when detaching the upright wall and wherein this upright wall is provided with one or more openings which form a passage through the upright wall in a direction perpendicular to the wall;

wherein the upright wall at least partly extends in a zone above the frame, within the width of the frame, wherein the detachable connections between the upright wall and the top profile and the bottom profile are of a rigid design, and wherein the upright wall next to the one or more openings is substantially configured as a framework structure for transferring loads between the frame and the wall.

[0010] By moving the upright wall which is provided with the one or more openings in such a way that this upright wall at least partly extends in a zone above the frame, within the width of the frame, and by connecting this upright wall in a rigid manner to the top profile and the bottom profile of the housing structure, it is now possible to satisfy the conflicting requirements of, on the one hand, absorption of forces and, on the other hand, not completely closing off the space between the top profile and the bottom profile in the plane of the frame.

[0011] Contrary to what is stated in NL 1 021 803 A1, the most important factor for deformation of the housing of such housing structures is not the height thereof, but the length thereof. The reason for this is that, with a small housing structure, the wind pressure is small and can easily be absorbed by the frame. With longer housing structures (i.e. wider windows or doors), the wind load increases significantly and the wind load which is to be absorbed by the housing (the portion of the wind load which is not absorbed by the frame) increases even more.

As a result of the positioning, construction and rigid connection between the upright wall and the bottom profile and top profile, the deformation of the housing is minimized. Any additional vertical deformation (in a direction along the plane of the wall) would have a significant effect. The width of the upright wall is determined by the forces to be transferred and in particular the moment action of these forces, which are mainly determined by the height of the housing.

[0012] A significant problem of the solution offered in NL 1 021 803 A1 is that it still cannot sufficiently absorb bending in a horizontal plane (in a direction perpendicular to the plane of the wall). By means of the positioning, construction and rigid connection of the components according to the present invention, it is now possible to absorb this flexure in a satisfactory way.

[0013] In a particularly preferred embodiment of a housing structure according to the present invention, the upright wall comprises a wall element in which said openings extend, wherein the framework structure extends next to this wall element so that it extends substantially next to said openings and wherein the framework structure is rigidly connected to this wall element.

[0014] More specifically, such a wall element may then be configured as a ventilation grille.

[0015] Preferably, such a wall element comprises an upper wall, a lower wall and partitions which extend at a distance from one another between the upper wall and the lower wall and are rigidly connected to these walls.

[0016] With such partitions, such a wall element will comprise several of said openings, which extend next to each other and are separated from one another by means of these partitions. It is also possible to arrange several rows of openings one above the other with such a wall element.

[0017] In order to further increase the rigidity of a housing structure according to the present invention using such a wall element, the framework structure of such a housing structure preferably comprises an upper wall which adjoins the lower wall of the wall element and is rigidly connected thereto in order to rigidly connect the framework structure to the wall element.

[0018] In this case, this upper wall of such a framework structure and the lower wall of the wall element adjoin one another preferably via a contact surface, wherein this contact surface is essentially preferably as wide as the width of the lower wall of the wall element. If the wall element extends essentially along the length of the housing structure, this contact surface preferably also extends essentially along the length of the housing structure.

[0019] Furthermore, the upper wall of the wall element preferably adjoins the top profile and said upper wall is rigidly connected thereto in order to rigidly connect the upright wall to the top profile.

[0020] This upper wall of the wall element and the top profile then preferably adjoin one another via a contact surface, wherein this contact surface is essentially preferably as wide as the width of the upper wall of the ven-

tilation grille. If the wall element extends substantially along the length of the housing structure, this contact surface preferably also extends essentially along the length of the housing structure.

5 **[0021]** In a preferred embodiment of a housing structure according to the present invention, the framework structure comprises a lower wall which adjoins the bottom profile and is rigidly connected thereto in order to rigidly connect the upright wall to the bottom profile.

10 **[0022]** In this case, this lower wall of such a framework structure and the bottom profile then preferably adjoin one another via a contact surface, wherein this contact surface extends essentially along the length of the housing structure. As indicated, this contact surface is preferably also made sufficiently wide (as wide as possible) in order to be able to ensure sufficient resistance to the critical bending in the horizontal plane (in a direction perpendicular to the plane of the wall). On the other hand, the width of this framework structure is obviously also
20 limited due to peripheral factors, such as the need to be able to arrange a screen roller next to it inside the space of the housing structure. In practice, the dimensioning of this width is preferably determined by means of strength calculations and/or worst-case simulations. The width is preferably at least 15 mm and still more preferably at
25 least 20 mm.

[0023] More specifically, each of said rigid connections between a first element to be connected and a second element to be connected can be produced by means of
30 at least two hook-engagement connections which are arranged a distance apart, wherein each hook-engagement connection comprises a first hook-engagement element which forms part of the first element to be connected and comprises a second hook-engagement element which forms part of the second element to be connected, wherein the first hook-engagement element and the second hook-engagement element hook into one another in order to produce the hook-engagement connection. The direction in which the different hook-engagement elements hook into each other is preferably identical with and is preferably chosen to be the direction in which the upright wall is fastened, in order to facilitate detachment of the upright wall when the different hook-engagement elements are unhooked again.

45 **[0024]** Such hook-engagement elements preferably extend essentially along the length of the elements to be connected and more preferably essentially along the length of the housing structure.

[0025] A particular embodiment of a housing structure according to the present invention comprises at least one coupling element which is arranged between the ends of the housing structure at a distance from these ends and extends between the top profile and the bottom profile in order to transfer loads between the frame and the wall.

55 **[0026]** Alternatively, a coupling element according to the present invention may also be used in similar housing structures without a framework structure and as an alternative to the coupling element described in NL 1 021 803

A1. Such a coupling element according to the present invention could, for example, also be used with housing structures wherein the upright wall does not comprise any openings, but is completely made up of a framework structure and at least partly extends in a zone above the frame, within the width of the frame. In this case, the coupling element can then, for example, also be used to fasten this framework structure, in order to removably attach it, analogously to the way described below in which such a coupling element can be used to fix a ventilation grille on top of a framework structure.

[0027] The various particular embodiments of coupling elements according to the present invention have different advantages compared to the coupling element from NL 1 021 803 A1.

[0028] In particular, a housing structure with coupling element according to the present invention may comprise a cover profile which covers the housing structure next to the upright wall and at a distance from this upright wall, wherein this cover profile is suspended from the coupling element in order to accommodate this cover profile in the housing structure. More specifically, the coupling element and/or the cover profile may be provided to this end with corresponding suspension elements. In this way, the coupling element is used in a multifunctional way for transferring forces and for coupling different components of the housing structure.

[0029] More specifically, the housing structure may also comprise first fastening flanges, adjacent to the upright wall or forming part of the upright wall, which first fastening flanges are arranged at a distance from one another and the coupling element may comprise corresponding second fastening flanges which are arranged at a distance from one another, wherein the coupling element is rotatable between a first position, in which the second fastening flanges are freely movable next to the first fastening flanges, away from the upright wall and towards the upright wall, and a second position, in which the second fastening flanges engage behind the first fastening flanges. In this way, the coupling element can be attached in a much simpler and quicker way than the coupling element from NL 1 021 803 A1.

[0030] More specifically, the housing structure may further comprise a first clamping element, adjacent to the upright wall or forming part of the upright wall, which first clamping element is arranged at a distance from one of the first fastening flanges and the coupling element may comprise a second clamping element which is arranged at a distance from one of the second fastening flanges, wherein the first clamping element, in the second position of the coupling element, engages with the second clamping element in order to secure the coupling element.

[0031] More specifically, the housing structure may still further comprise a first hook element, adjacent to the upright wall or forming part of the upright wall, and the coupling element may comprise a second hook element, wherein the first hook element, in the second position of the coupling element, hooks behind the second hook el-

ement.

[0032] More specifically, the housing structure may, in addition, comprise a limiting element, adjacent to the upright wall or forming part of the upright wall, in order to limit the movement of the coupling element when this coupling element is rotated from its first position to its second position.

[0033] The object of the present invention is also achieved by providing a screen device comprising a housing structure according to the present invention, comprising a screen roller which is arranged in said space between the top profile and the bottom profile and a screen for covering the door or window opening which can be rolled up onto and unrolled from the screen roller.

[0034] The present invention will now be explained in more detail by means of the following detailed description of some preferred embodiments of a housing structure according to the present invention. The sole aim of this description is to give illustrative examples and to indicate further advantages and particulars of this housing structure, 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.

[0035] Reference numerals are used in this detailed description to refer to the attached drawings, in which:

- **figure 1** shows an embodiment of a screen device according to the present invention with a housing structure according to the present invention in cross section;
- **figure 2** shows a second embodiment of a screen device according to the present invention with a housing structure according to the present invention in cross section;
- **figure 3** shows an embodiment of a screen device according to the present invention with a housing structure according to the present invention in perspective;
- **figure 4** shows a front view of a part of the upright wall of a housing structure according to the present invention with a coupling element according to the present invention which is shown in its first position;
- **figure 5** shows a cross section of a part of a housing structure according to the present invention with a part of the bottom profile, a part of the top profile, the upright wall and the coupling element, with the coupling element in its first position;
- **figure 6** shows a front view of the part of the upright wall from figure 4 with the coupling element in a position between its first position and its second position;
- **figure 7** shows a cross section of the part of the housing structure from figure 5, with the coupling element in a position between its first position and its second position;
- **figure 8** shows a front view of the part of the upright wall from figure 4, with the coupling element in its second position;

- **figure 9** shows a cross section of the part of the housing structure from figure 5, with the coupling element in its second position.

[0036] The housing structures of the illustrated screen devices (1) in each case comprise a housing with a front wall (23), a rear wall (16, 27), a bottom profile (2), a top profile (3) and side walls (24) (head ends).

[0037] These screen devices (1) are configured to be fitted in a door or window opening above a frame (25).

[0038] The bottom profile (2) is configured to be attached to the top side of the frame (25) (see figures 1 and 2). This can be achieved, for example, by screwing this bottom profile (2) to the top side of the frame (25) using screws in one of the screw holes (28) (see figure 3).

[0039] The top profile (3) is configured to be attached to the wall in which the door or window opening is provided, at the top side of this door or window opening. This can be achieved, for example, by means of a dowel in the fastening slot (29) (see figures 1-3) or by means of screws which can be fitted in the top profile (3) through the slot (30) which is provided for this purpose (see figures 1-3).

[0040] In these embodiments, the side walls (24) (see figure 3) are attached to the bottom profile (2) and the top profile (3) by means of screws which are fitted in the screw channels (36) (see figures 1 and 2). These side walls (24) preferably extend against the side walls of the door or window opening.

[0041] In these embodiments, the front wall (23) is hooked onto the top profile (3) (37) (see figures 1 and 2) and attached to the side walls (24) by means of screws which engage in the screw channels (36) of this front wall (23). With a door or window opening which is situated in a façade, this front wall (23) will extend on the façade side of this façade.

[0042] As will be explained further below, in these embodiments the rear wall (16, 27) is suspended from coupling elements (15). With a door or window opening arranged in a façade, this rear wall (16, 27) will extend on the inside of the building, behind this façade.

[0043] The bottom profile (2), the top profile (3) and the side walls (24) are preferably made of a material which can be used to prevent thermal bridges between spaces between which the housing structure is arranged. To this end, the bottom profile (2) and the top profile (3) may be made of polyvinylchloride (PVC), for example by extrusion. The side walls (24) may be made of PVC, for example by injection-moulding.

[0044] With regard to possible finishes, the front wall (23) and the rear wall (16, 27) are in turn preferably made of aluminium.

[0045] A screen roller (4) is arranged between the side walls (24) so as to be rotatable about its shaft (35). This screen roller (4) extends in a space between the bottom profile (2) and the top profile (3). A cloth (5) is attached to this screen roller (4) and can be rolled up onto and unrolled from this screen roller (4) as a screen (5) so as

to at least partly screen off the door or window opening from, for example, sunlight and/or insects and/or heat and/or cold.

[0046] The lateral sides of the screen (5) and/or a bottom slat which is attached to the bottom side of the screen (5) may be guided in a screen guide and/or a slat guide (26) (see figures 1-3). Such a screen guide and/or slat guide (26) is arranged at the location of the lateral sides of the window or the door.

[0047] In addition to the screen roller (4), an upright wall (6, 7) extends between the bottom profile (2) and the top profile (3). Said upright wall (6, 7) is arranged in a zone above the frame (25), within the width of the frame (25), for absorbing loads on the frame (25) which are transferred to the wall.

[0048] The space in which the screen roller (4) extends is delimited by the side walls (24), the top profile (3) and the bottom profile (2) and the front wall (23) and this upright wall (6, 7), as can be seen in figures 1-3.

[0049] In order to allow fitting and removal of the screen roller (4), the upright wall (6, 7) is detachably connected to the bottom profile (2) and the top profile (3). To this end, the upright wall (6, 7) has to be at least as high as the height of the cloth roll unit (screen roller with the screen fitted thereto which may or may not be rolled onto the screen roller).

[0050] At the top side, this detachable connection is achieved here by means of two first hook-engagement elements (13) of the top profile (3) which are arranged at a distance from one another and into which two second hook-engagement elements (14) of the upright wall (6, 7) hook. At the bottom side, this detachable connection is achieved analogously by means of two first hook-engagement elements (13) of the upright wall (6, 7) which hook into two second hook-engagement elements (14) of the bottom profile (2). For the sake of clarity of the figures, these hook-engagement elements have only been denoted by their reference numerals in figures 5, 7 and 9. The direction in which the different hook-engagement elements (13, 14) hook into each other is chosen to be identical with the direction in which the upright wall (6, 7) is fastened in order to facilitate detachment of the upright wall (6, 7) when the different hook-engagement elements (13, 14) are unhooked again.

[0051] These hook-engagement elements (13, 14) extend along the length of the elements (3, 6, 7, 2) to be connected.

[0052] In order to fix the upright wall (6, 7) in this position after the hook-engagement elements (13, 14) have been hooked in, it can be fixed by means of, for example, screws which engage in the bottom profile (2) via the slot (32) provided for this purpose through the upright wall (6, 7) (see figures 1-3 and 5). Such screws also make it possible to detach the upright wall (6, 7) again in a simple manner.

[0053] In the illustrated embodiments, the upright wall (6, 7) is divided into a ventilation grille as wall element (6) which extends on the top side of this wall (6, 7) and

a framework structure (7) which extends on the bottom side of this wall (6, 7). In this case, the ventilation grille (6) and the framework structure (7) are detachably connected to each other by means of first hook-engagement elements (13) of the ventilation grille (6) which hook into second hook-engagement elements (14) of the framework structure (7) (see figures 5, 7 and 9). The above-mentioned second hook-engagement elements (14) on the top side of the upright wall (6, 7) form part of the ventilation grille (6). The above-mentioned first hook-engagement elements (13) on the bottom side of the upright wall (6, 7) form part of the framework structure (7).

[0054] In order to be able to fix the ventilation grille (7) after it has been hooked, on one side, into the second hook-engagement elements (14) at the top of the framework structure (7) and, on the other side, into the first hook-engagement elements (13) at the top of the top profile (3), coupling elements (15) according to the present invention are used, as will be explained below.

[0055] The ventilation grille (7) furthermore comprises an upper wall (8), a lower wall (9) (see figures 1 and 2) and several partitions (10) (see figures 3, 4, 6 and 8) which extend between the upper wall (8) and the lower wall (9) and are a distance apart. The grille (7) is divided up by means of the partitions (10). As a result thereof, several air flow openings (38) are situated next to each other and are separated from each other by means of these partitions (10). These air flow openings (38) form a passage through the upright wall (6, 7) in a direction perpendicular to the plane of the wall.

[0056] In the first embodiment, as illustrated in figure 1, ventilation can take place through the door or window opening via these air flow openings (38). In this case, ventilation air can flow in through the opening (39) on the façade side of the door or window opening through which the screen (5) can be unrolled or rolled up and flow over the screen roller (4) to the ventilation grille (6) via an air flow duct (40). This ventilation air will then flow through the air flow openings (38) here and towards the adjacent interior space of the building in which the screen device (1) is arranged in the door or window opening and in this case flows through an opening (42) in the rear wall (16, 27) into the interior space. Towards the interior space, the rear wall (16, 27) is provided with a shutter flap (27) by means of which the respective opening (42) through the rear wall (16, 27) can be closed off. It is also possible to set the desired supply flow rate by means of this shutter flap (27).

[0057] In the second embodiment as illustrated in figure 2, no ventilation through the screen device (1) is possible. The air flow openings (38) in the ventilation grille (6) are in this case filled with insulating material which increases the thermal and/or acoustic insulation of the screen device (1). In this embodiment, the rear wall (16, 27) is configured as a continuous single piece across essentially the entire height of the screen device (1), without air flow openings.

[0058] The ventilation grille (6) is preferably also made

of a material which is able to prevent thermal bridges between an interior space and an external space between which the screen device (1) is arranged. To this end, the ventilation grille (6) may be made of PVC, for example by injection-moulding.

[0059] The framework structure (7) also comprises an upper wall (11) and a lower wall (12) (see figures 1 and 2) and is configured in a known manner as a framework structure between these walls (11, 12) in order to be able to transfer forces to the highest possible degree.

[0060] This framework structure (7) is also preferably made of a material which prevents thermal bridges. To this end, the framework structure (7) may be made of PVC, for example by means of extrusion.

[0061] As a result of the hook-engagement elements (13, 14) and the associated detachable connections with screws and coupling pieces (15), the different components of the upright wall (6, 7) are rigidly connected to each other and rigidly connected to the top profile (3) and the bottom profile (2). With the hook-engagement connections (13, 14) between two adjacent components (3, 6, 7, 2), in each case preferably two (as is the case in the illustrated embodiments) or more hook-engagement elements (13, 14) are provided at a distance from each other for each component (3, 6, 7, 2) in order to increase the rigidity of the connection. The partitions (10) of the ventilation grille (6) are also rigidly connected to the upper wall (8) and the lower wall (9) of the ventilation grille (6).

[0062] In this way, the upright wall (6, 7) can ensure sufficient bending stiffness in the horizontal and vertical direction. In addition, the bending stiffness is also increased by ensuring that the contact surfaces between the different components (3, 6, 7, 2) are made sufficiently large.

[0063] As has already been mentioned above, after it has been hooked into, on the one side, the second hook-engagement elements (14) on top of the framework structure (7) and, on the other side, in the first hook-engagement elements (13) on top of the top profile (3), the ventilation grille (6) is fixed by means of several coupling elements (15). These coupling elements (15) are in each case arranged at a distance from each other and at a distance from the head ends (24), and in this case extend between the top profile (3) and the bottom profile (2).

[0064] These coupling elements (15) contribute to absorbing loads on the frame (25) which are transferred to the wall.

[0065] Furthermore, a cover profile (16) of the rear wall (16, 27) is also suspended from these coupling elements (15) (see figures 1 and 2), and, in the embodiment where the screen device (1) also serves as a ventilation device, an additional insect screen (41) is also suspended therefrom (see figure 1). In order to be able to suspend the cover profile (16) in a secure manner from the coupling elements (15), each coupling element (15) is provided with click-fit elements (33) to which the cover profile (16) can be click-fitted by means of corresponding click-fit elements (34).

[0066] Figures 4 to 9 show how these coupling elements (15) can be attached to the housing structure and how the ventilation grille (6) is also secured in the process.

[0067] Each coupling element (15) comprises two second fastening flanges (18) which can engage behind a first fastening flange (17) of the top profile (3) and a first fastening flange (17) of the framework structure (7), respectively, in order to fasten the coupling element (15). The first fastening flange (17) of the top profile (3) is arranged adjacent to the upper wall (8) of the ventilation grille (6). The first fastening flange (17) of the framework structure (7) is arranged adjacent to the lower wall (9) of the ventilation grille (6). Adjacent to these first fastening flanges (17), passage slots are provided in the ventilation grille (6) which are not visible in the figures. These passage slots extend through the upper wall (8) and the lower wall (9) of the ventilation grille (6) respectively. In order to enable these second fastening flanges (18) to engage behind the first fastening flanges (17), the coupling element (15) has to be fitted in a first position, as illustrated in figures 4 and 5, in an opening (38) of the ventilation grille (6). In this opening (38), the coupling element (15) is freely movable, with the second fastening flanges (18) situated next to the first fastening flanges (17), in a direction of the upright wall (6, 7) and towards the upright wall (6, 7). After fitting the coupling element (15) in this opening (38) in its first position, the coupling element (15) is rotatable between this first position and a second position (figures 8 and 9). In this second position, the second fastening flanges (18) engage behind the first fastening flanges (17), as can be seen in figures 8 and 9. As the second fastening flanges (18) engage with the ventilation grille (6) through the passage slots in order to be able to engage behind the first fastening flanges (17), the ventilation grille (6) is also secured in the process. An intermediate position between the first position and the second position is illustrated in figures 6 and 7.

[0068] Preferably, the housing structure also comprises a limiting element in order to limit the rotating movement of the coupling element (15) from its first position to its second position. In this case, the passage slots in the ventilation grille (6) may serve as such a limiting element, for example.

[0069] In order to be able to keep the coupling elements (15) securely in the second position even after they have been rotated, each coupling element (15) also comprises a second clamping element (20) which is arranged at a distance from the second fastening flanges (18). The top profile (3) comprises a corresponding first clamping element (19) which is arranged at a distance from the first fastening flanges (17). In the first position of the coupling element (15), the clamping elements (19, 20) do not engage behind one another. When the coupling element (15) is in a position between its first position and its second position, just before the second clamping element (20) engages behind the first clamping element (19), the distance between the second clamping element (20) and

the second fastening flange (18) which is arranged nearest to the top profile (3), at the location of the first clamping element (19), is initially larger than the distance between the first clamping element (19) and the first fastening flange (17) of the top profile (3). Upon rotation of the coupling element (15) towards its second position, the distance between the second clamping element (20) and the second fastening flange (18) which is arranged closest to the top profile (3) becomes increasingly smaller until, in the second position, it is eventually smaller than the distance between the first clamping element (19) and the first fastening flange (17) of the top profile (3). As the distance between the second clamping element (20) and the second fastening flange (18) which is arranged closest to the top profile (3) is smaller in this second position than the distance between the first clamping element (19) and the first fastening flange (17) of the top profile (3), the coupling element (15) is fixed by means of these clamping elements (19, 20).

[0070] In order for the coupling elements (15) to be able to contribute positively in transferring loads, the coupling elements (15) furthermore comprise a second hook element (22) near their bottom side and the framework structure (7) comprises a corresponding first hook element (21) near to its bottom side, wherein these hook elements (21, 22), in the first position of the coupling elements (15), do not engage with each other and these hook elements (21, 22), in the second position of the coupling elements (15), are hooked into each other.

[0071] The coupling elements (15) are also preferably made of a material which prevents thermal bridges. To this end, these coupling elements (15) may be made of PVC, for example by injection-moulding.

[0072] It is possible to fit thermal and/or acoustic insulation (42) between the coupling elements (15) in order to give the screen device (1) desired thermal and/or acoustic properties (see figure 1). Obviously, such insulation should not impede the through-flow of air in the embodiment where the screen device (1) also serves as a ventilation device.

[0073] It is also possible to fit thermal and/or acoustic insulation (42) in the space in which the screen roller (4) is arranged in locations where it does not impede the rolling up or unrolling of the screen (5) and any through-flow of air (see figure 1).

[0074] Figures 1 to 3 illustrate embodiments of screen devices (1) in which the ventilation grille (6) is fixed to a coupling element (15) according to the invention. Alternative embodiments may be configured by omitting the coupling elements (15). To this end, in the illustrated embodiments the top profile (3) is configured as having an extension profile (31) which is only added to the top profile (3) when coupling elements (15) are incorporated in the screen device (1).

Claims

1. Housing structure for a screen device (1) for fitting in a door or window opening in a wall, adjacent to a door or window frame (25) which is arranged in this door or window opening, comprising
 - a bottom profile (2) for fastening the housing structure to the top of the frame (25);
 - a top profile (3) for fastening the housing structure to the wall at the top side of the opening, wherein a space extends between the bottom profile (2) and the top profile (3) for arranging a screen roller (4) of the screen device (1) therein on which a screen (5) of the screen device (1) can be rolled up and unrolled in order to cover the opening;
 - an upright wall (6, 7) which is arranged next to said space, extends between the bottom profile (2) and the top profile (3) and is detachably connected to the bottom profile (2) and the top profile (3), so that a passage opening for fitting or removing the screen roller (4) is made accessible when detaching the upright wall (6, 7) and wherein this upright wall (6, 7) is provided with one or more openings (38) which form a passage through this upright wall (6, 7) in a direction perpendicular to the plane of the wall;
characterized in that the upright wall (6, 7) at least partly extends in a zone above the frame (25), within the width of the frame (25), **in that** the detachable connections (13) between the upright wall (6, 7) and the top profile (3) and the bottom profile (2) are of a rigid design, and **in that** the upright wall (6, 7) next to the one or more openings (38) is substantially configured as a framework structure (7) for transferring loads between the frame (25) and the wall.
2. Housing structure according to Claim 1, **characterized in that** the upright wall (6, 7) comprises a wall element (6) in which said openings (38) extend, wherein the framework structure (7) extends next to this wall element (6) so that it extends substantially next to said openings (38) and wherein the framework structure (7) is rigidly connected to this wall element (6).
3. Housing structure according to Claim 2, **characterized in that** the wall element (6) comprises an upper wall (8), a lower wall (9) and partitions (10) which extend at a distance from one another between the upper wall (8) and the lower wall (9) and are rigidly connected to these walls (8, 9).
4. Housing structure according to Claim 3, **characterized in that** the framework structure (7) comprises an upper wall (11) which adjoins the lower wall (9) of the wall element (6) and is rigidly connected thereto in order to rigidly connect the framework structure (7) to the ventilation grille (6).
5. Housing structure according to Claim 4, **characterized in that** the upper wall (11) of the framework structure (7) and the lower wall (9) of the wall element (6) adjoin one another via a contact surface, wherein this contact surface is essentially as wide as the width of the lower wall (9) of the wall element (6).
6. Housing structure according to one of Claims 2 to 5, **characterized in that** the upper wall (11) of the wall element (6) adjoins the top profile (3) and is rigidly connected thereto in order to rigidly connect the upright wall (6, 7) to the top profile (3).
7. Housing structure according to Claim 3 and 6, **characterized in that** the upper wall (11) of the wall element (6) and the top profile (3) adjoin one another via a contact surface, wherein this contact surface is essentially as wide as the width of the upper wall (11) of the wall element (6).
8. Housing structure according to one of the preceding claims, **characterized in that** the framework structure (7) comprises a lower wall (12) which adjoins the bottom profile (2) and is rigidly connected thereto in order to rigidly connect the upright wall (6, 7) to the bottom profile (2).
9. Housing structure according to Claim 8, **characterized in that** the lower wall (11) of the framework structure (7) and the bottom profile (2) adjoin one another via a contact surface, wherein this contact surface extends essentially along the length of the housing structure (1).
10. Housing structure according to one of the preceding claims, **characterized in that** each said rigid connection (13, 14) between a first element to be connected (2, 6, 7) and a second element to be connected (6, 7, 3) is produced by means of at least two hook-engagement connections (13, 14) which are arranged a distance apart, wherein each hook-engagement connection (13, 14) comprises a first hook-engagement element (13) which forms part of the first element to be connected (2, 6, 7) and comprises a second hook-engagement element (14) which forms part of the second element to be connected (6, 7, 3), wherein the first hook-engagement element (13) and the second hook-engagement element (14) hook into one another in order to produce the hook-engagement connection (13, 14).
11. Screen device (1) comprising a housing structure according to one of the preceding claims, comprising a screen roller (4) which is arranged in said space

between the top profile (3) and the bottom profile (2) and a screen (5) for covering the door or window opening which can be rolled up onto and unrolled from the screen roller (4).

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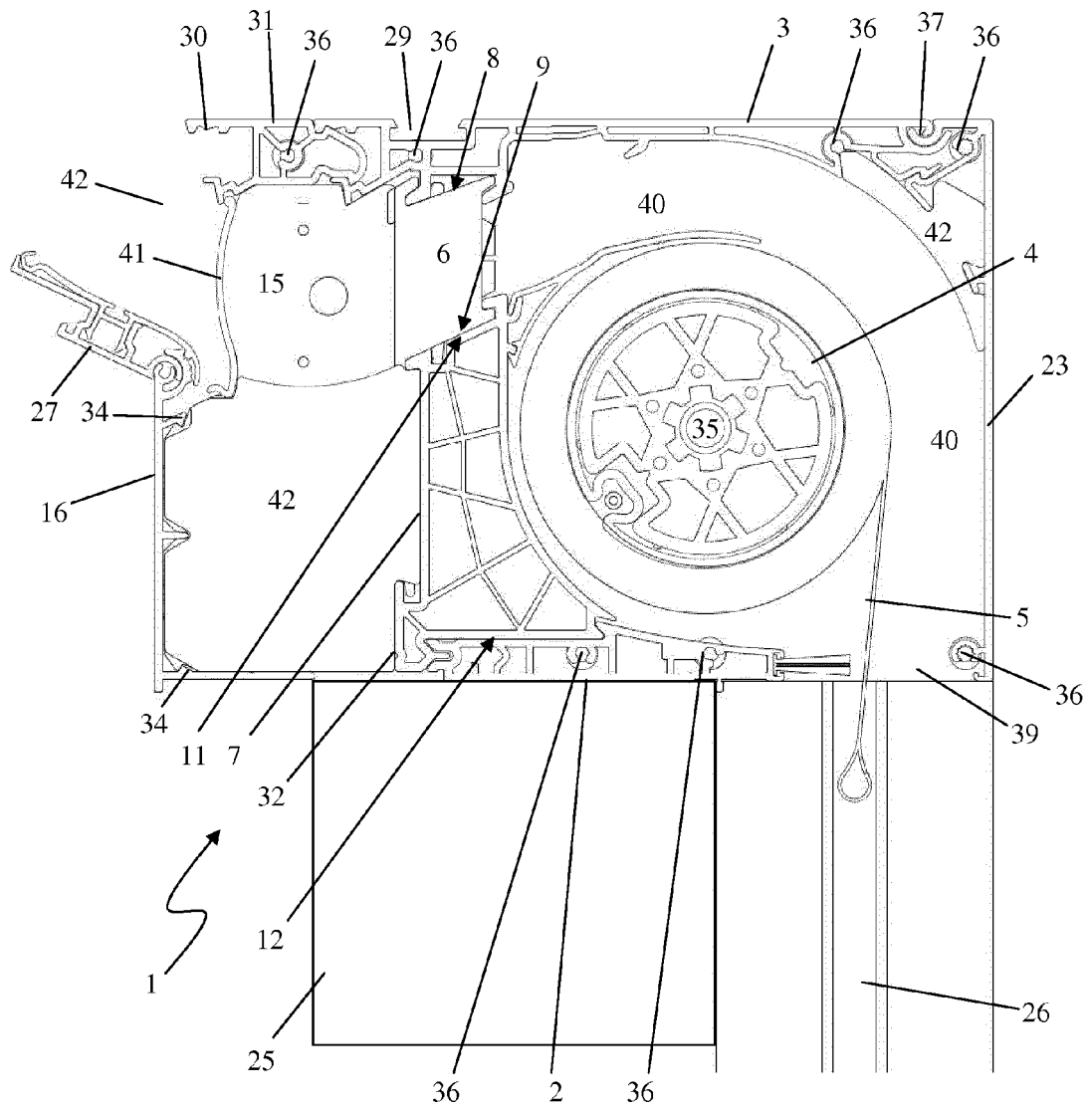


FIG. 1

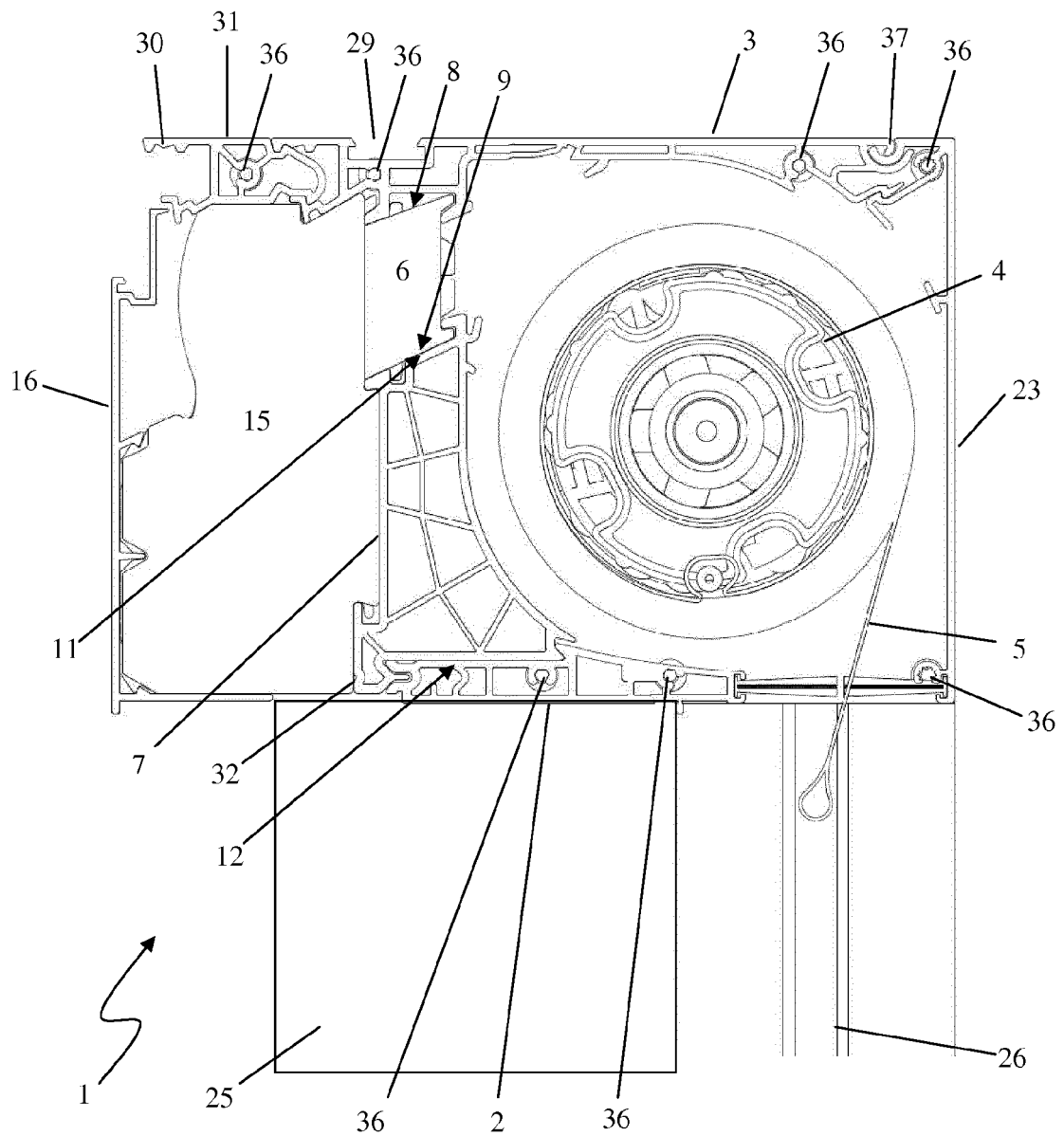


FIG. 2

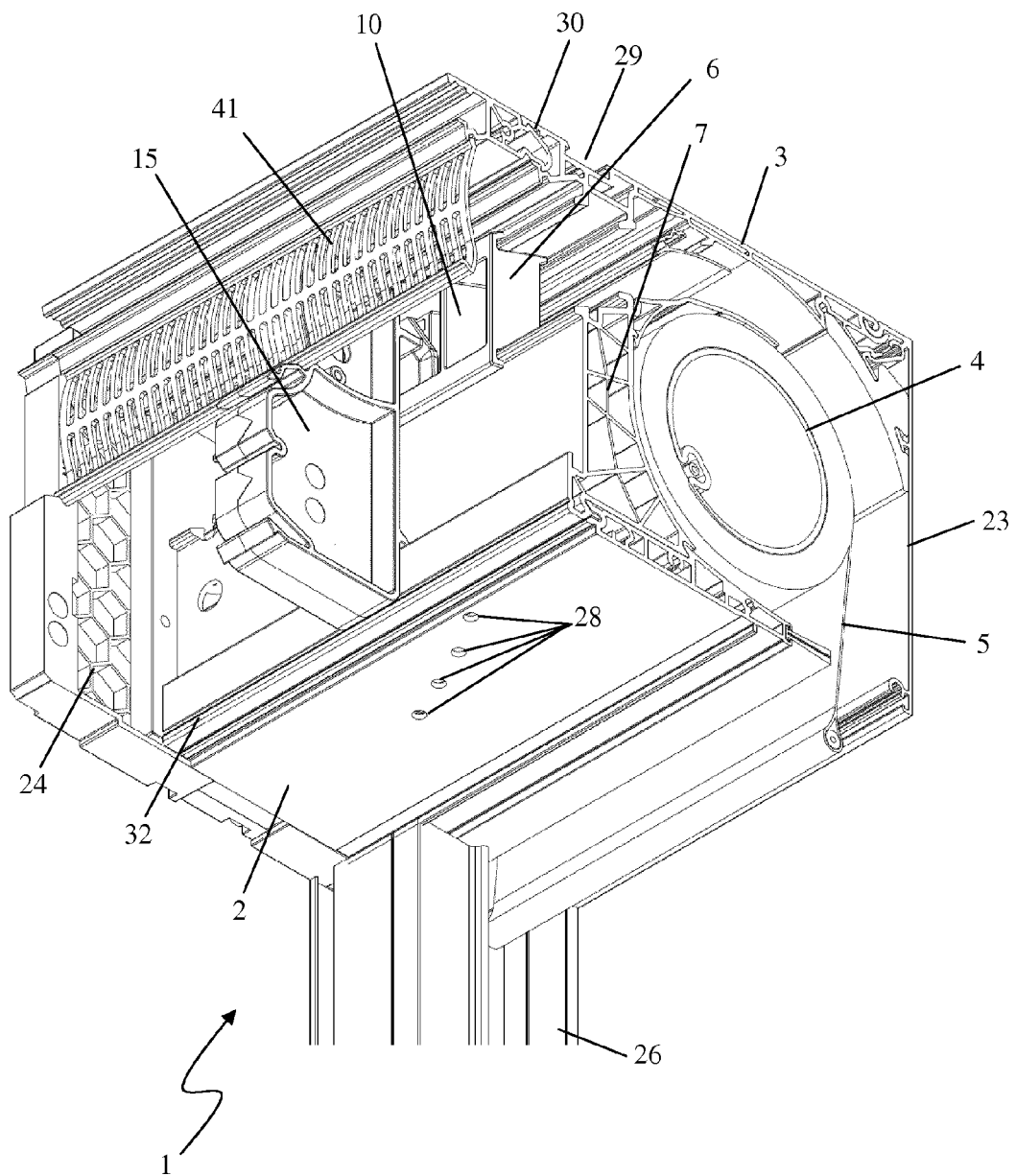
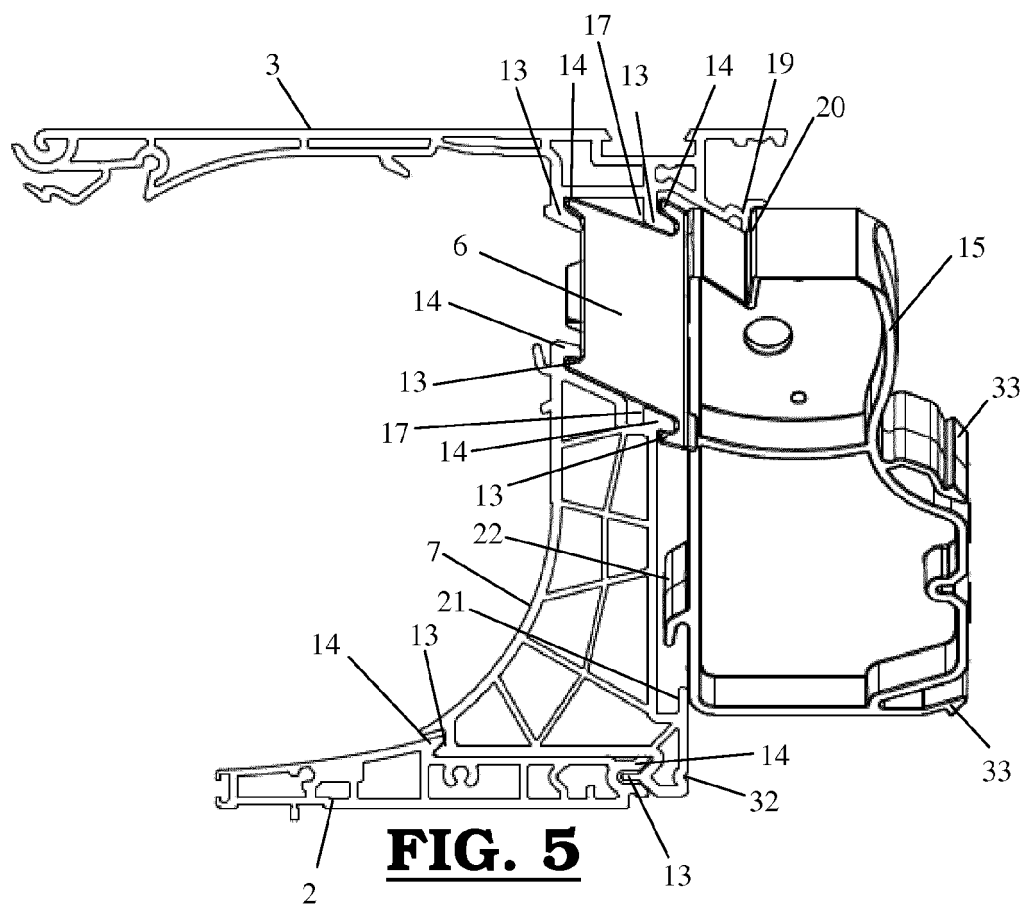
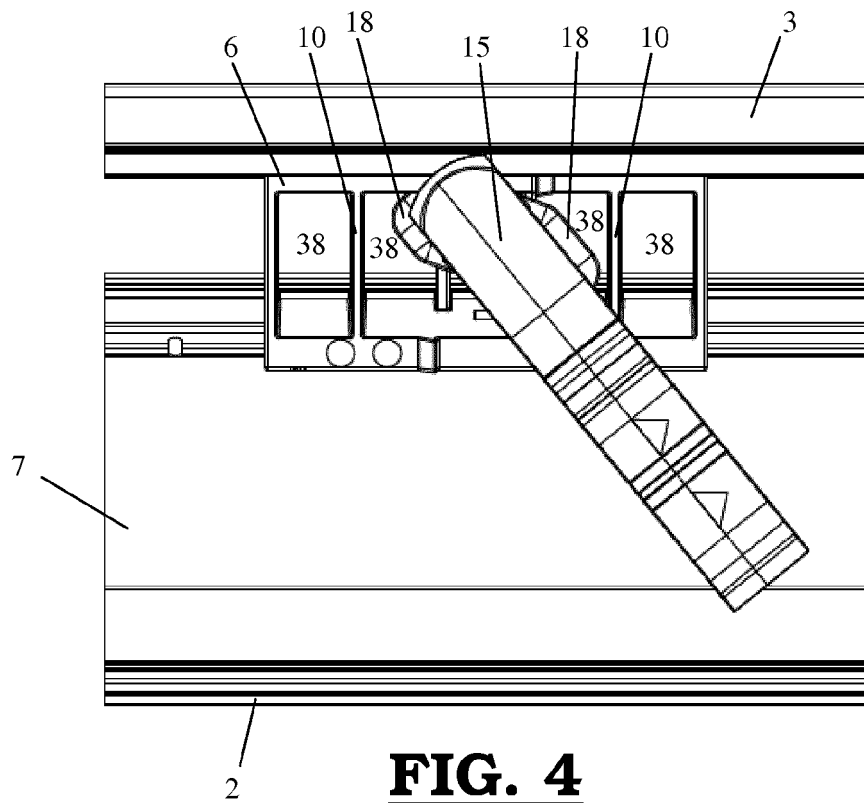
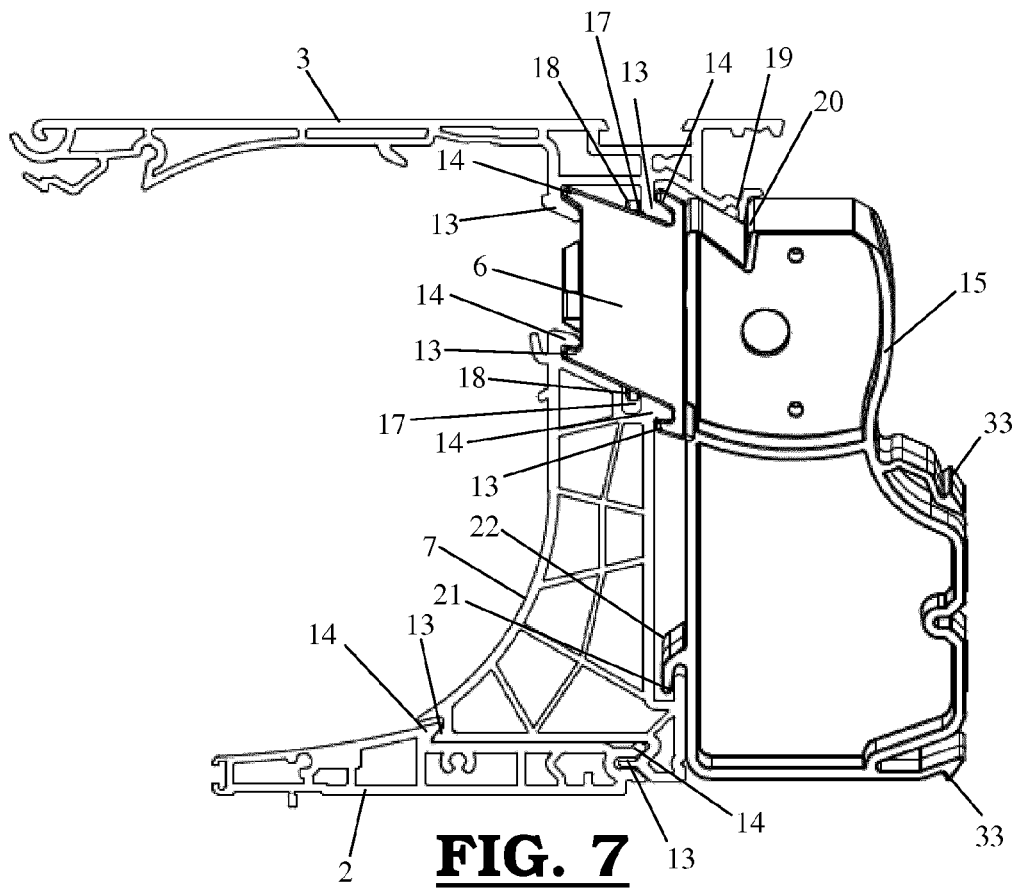
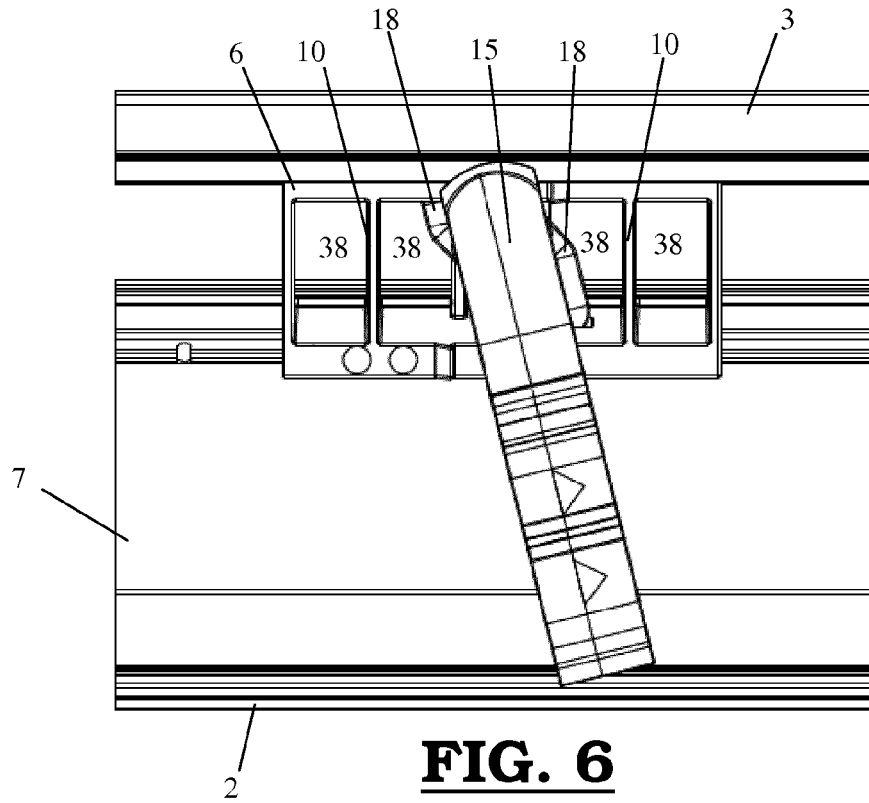
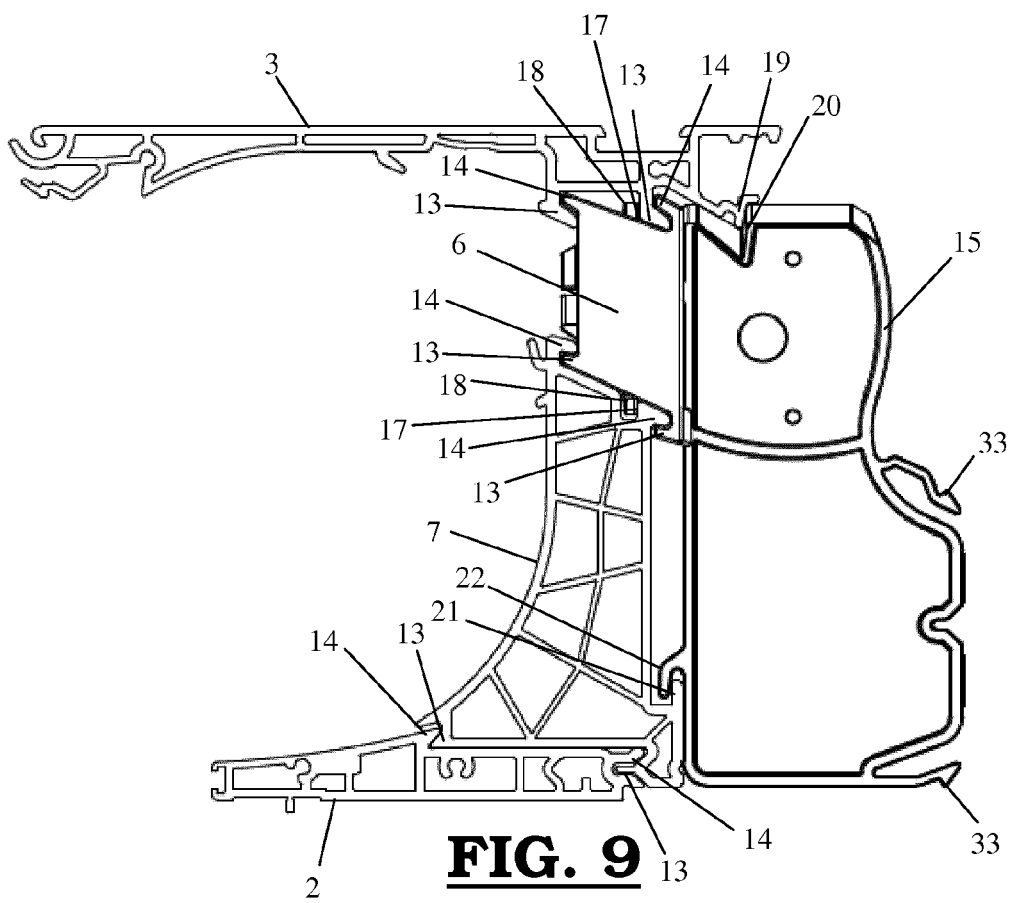
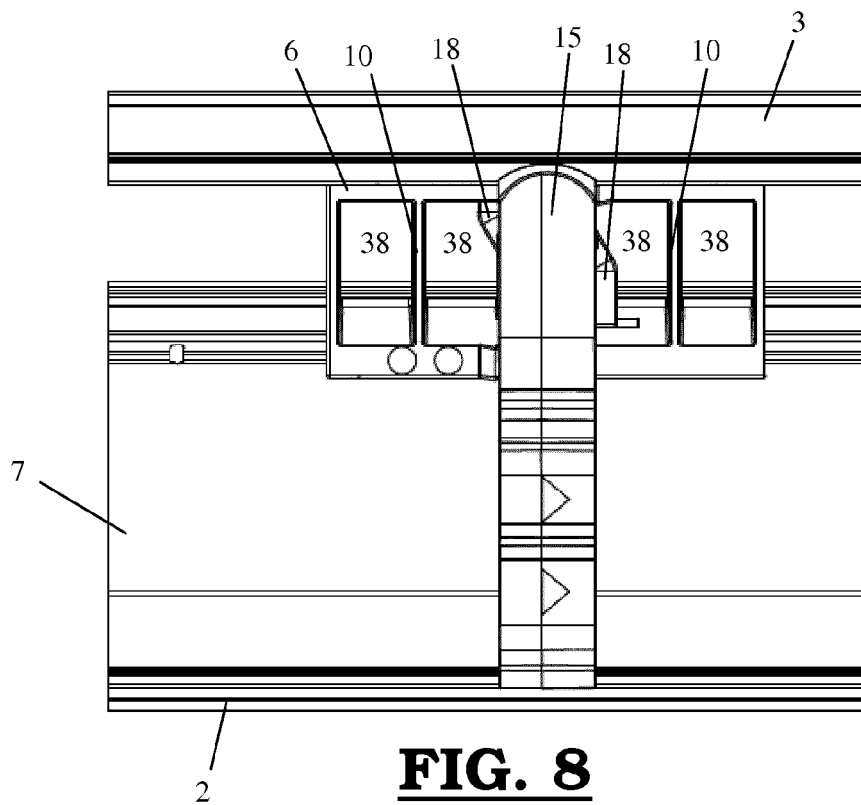


FIG. 3









EUROPEAN SEARCH REPORT

Application Number
EP 14 15 5757

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	FR 2 773 584 A1 (ECRAN SYSTEM [FR]) 16 July 1999 (1999-07-16) * page 6, line 17 - page 7, line 9; figures 1,2,4,5 * -----	1,11	INV. E06B9/17
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 June 2014	Examiner Peschel, Gerhard
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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REFERENCES CITED IN THE DESCRIPTION

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