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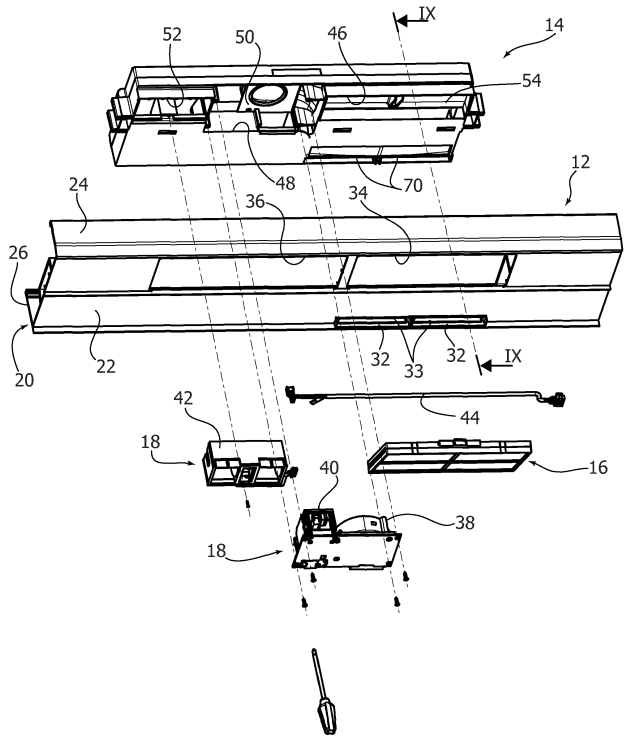
(54) Ventilation device

(57) A ventilation device for doors or windows, comprising an outer casing (12) and an air conveyor (14) mounted within said casing (12) and equipped with seats (50, 54) shaped to receive a filter (16) and a fan assembly (18), said air conveyor (14) having access openings (46, 48) facing at least one window (34, 36) of said outer casing (20) so that said filter (16) and said fan assembly (18) are mountable in said air conveyor (14) through said at least one window (34, 36) of the outer casing (12).

FIG. 2



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Description

Field of the invention

[0001] The present invention relates to a ventilation device for buildings, intended to be mounted on a frame of a door or window. More precisely, the invention relates to a ventilation device including a filter for filtering an airflow directed from the outside towards the internal environment, and a fan assembly arranged to generate an airflow from the outside and to introduce a filtered airflow into the internal environment.

Description of the prior art

[0002] In the state of the art, various ventilation devices are known intended to be fixed onto the frame of a door or window. The ventilation devices of known type have an outer casing, which is manufactured in a number of standardized sizes. Often, the sizes of the doors or windows do not coincide with the standardized sizes of the commercially available ventilation devices. In these cases, it is difficult to ensure the aesthetic integration of the ventilation device with the door or window.

[0003] Another problem is that the known ventilation devices are supplied with the electrical components (fan, electronic control board, power supply, etc.) already assembled within the casing. This involves a high risk of damage to the electrical components of the ventilation devices due to the prolonged stay of the ventilation devices in construction sites during the completion of building works.

Object and summary of the invention

[0004] The present invention aims to provide a ventilation device that is both aesthetically integrated with the frame of the door or window and which avoids the risk of damage to the electrical components during the completion of the building works in the construction site.

[0005] According to the present invention, this object is achieved by a ventilation device having the characteristics forming the subject of claim 1.

[0006] The claims form an integral part of the disclosure given in relation to the invention.

Brief description of the drawings

[0007] The present invention will now be described in detail with reference to the accompanying drawings, given purely by way of non-limiting example, wherein:

- Figure 1 is an exploded perspective view of a ventilation device according to the present invention,
- Figure 2 is an exploded perspective view from a different angle of certain components of the device of Figure 1,
- Figures 3 to 7 are perspective views illustrating the mounting sequence of some of the components of the ventilation device on the frame of a door or window before the installation of the frame,
- Figure 8 is a perspective view illustrating the mounting of the electrical components of the ventilation device after the installation of the frame,
- Figure 9 is a cross-section along the line IX-IX of Figure 2, and
- Figure 10 is a perspective view illustrating the direction of the airflow through the ventilation device according to the invention.

Detailed description of the invention

[0008] With reference to Figure 1, numeral 10 indicates a ventilation device for doors or windows according to the present invention. The ventilation device 10 comprises an outer casing 12 in which an air conveyor 14 is housed. A filter 16 and a fan assembly 18 are intended to be mounted inside the air conveyor 14. The fan assembly 18 comprises a centrifugal fan 38, a power supply/transformer 40 and an electrical power supply cable 44. The ventilation device 10 may also be equipped with outlet air vents 42 openable and closable by means of a motor controlled by a remote control.

[0009] The outer casing 12 comprises an extruded profile 20, preferably made of plastic material, having a U-shaped cross-section. The profile 20 has a base wall 22, an inner front wall 24 and an outer front wall 26. The front walls 24, 26 are orthogonal to the base wall 22. The outer casing 12 comprises a closure panel 28, which is applied to the ends of the front walls 24, 26 to close the side of the profile 20 opposite to the base wall 22. Preferably, the ends of the front walls 24, 26 are equipped with respective longitudinal guides in which the opposite side edges of the closure panel 28 are inserted, with a movement in the longitudinal direction. The outer casing 12 also comprises a pair of covers 30, which are applied to the opposite open ends of the profile 20.

[0010] With reference to Figures 1 and 2, the profile 20 has one or more slots 32 for the inlet of an airflow located on the base wall 22 adjacent to the outer front wall 26. In the slots 32, air vents 33 are preferably inserted. The profile 20 is also equipped with one or more access windows. In the illustrated example, two access windows 34, 36 are provided. The first access window 34 has dimensions that allow the passage of the filter 16. The second access window 36 has dimensions that allow the passage of the fan assembly 18 and, where applicable, of the remote-controlled air vents 42. Alternatively, a single access window could be provided, with dimensions equal to the sum of the two access windows 34, 36.

[0011] With reference to Figure 2, the air conveyor 14 is formed by a box-shaped body of plastic material, within which seats for the housing of the filter 16 and the fan assembly 18 are defined. The air conveyor 14 has inlet openings 70 for the inlet of the airflow, which couple with the inlet air vents 33 fixed to the profile 20. The air con-

veyor 14 has a first access opening 46, which allows the insertion and extraction of the filter 16 within the air conveyor 14, and a second access opening 48, which allows the mounting of the fan assembly 18 in the respective seat. In Figure 2, numeral 50 indicates the seat of the air conveyor 14 in which the fan assembly 18 is intended to be mounted. Numeral 52 indicates the seat configured to receive the remote-controlled air vents 42. The seats 50, 52 are accessible through the opening 48. Numeral 54 indicates a seat configured to receive the filter 16 through the access opening 46.

[0012] The access windows 34, 36 of the profile 20 are intended to be closed by respective doors indicated with 56, 57 in Figure 1. The door 56 associated with the window 34 is formed from a closed panel while the door 57 associated with the window 36 is equipped with openings for the outlet of the airflow.

[0013] With reference to Figures 3 to 8, the mounting operations of the ventilation device 10 will now be described.

[0014] In a first step, illustrated in Figure 3, the profile 20 is cut to size, to a length equal to the width of the door frame or window on which the device 10 is intended to be installed. In Figure 3, numeral 59 indicates sections of the profile 20 eliminated as waste after cutting to size. The closure panel 28 is also cut to size. The profile 20, cut to size, is then fixed on a door or window frame 58, as illustrated in Figure 4. The fastening of the profile 20 can be carried by means of screws 60. Then, as shown in Figure 5, the air conveyor 14 is inserted within the profile 20. The air conveyor 14 is devoid of the filter 16 and the fan assembly 18. The air conveyor 14 is positioned so that the access openings 46, 48 are aligned with the windows 34, 36 of the profile 20. Two spacer elements 62, arranged on opposite sides of the air conveyor 14, are also mounted inside the profile 20. The spacer elements 62 are located in the areas in which the screws for fastening the frame 58 to the wall are inserted. Then, as illustrated in Figures 6 and 7, the previously cut-to-size closure panel 28 is applied to the profile 20, along with the covers 30, which close the open ends of the profile 20. These operations are carried out in the workshop in which the frames 58 are assembled. Cutting to size of the profile 20 and the closure panel 28 are performed by the same person that carries out the cutting and mounting of the profiles forming the frame 58. As is visible in Figure 7, the casing 12 of the ventilation device has a width equal to the width of the frame 58. This allows a perfect aesthetic integration between the casing 12 and the frame 58. In particular, the casing 12 and the frame 58 can have the same surface finish. If the frame 58 is painted, the same paint can be applied on the casing 12. In cases in which the outer side and the inner side of the frame 58 have different colours, different colours can be used for the outer parts and the inner parts of the casing 12, so as to obtain a perfect aesthetic integration both on the outer side and on the inner side of the frame 58.

[0015] The frame 58 with the housing 12 mounted thereon is then transported to the construction site where the installation is envisaged, and is mounted in the wall corresponding to a door or window opening. In this first step, the most delicate components of the ventilation device (the filter 16, the fan unit 18 and possibly the remote-controlled air vents 42) have not yet been assembled.

[0016] In this way, the risk of damage to the electrical components is avoided due, for example, to the temporary outside storage of the frame 58 and the prolonged stay of frames 58 with the relative casings 12 in the construction site. The most delicate components of the ventilation device can be installed after completion of the heaviest building works, for example, during installation of lighting devices, air conditioning devices, etc. As illustrated in Figure 8, the mounting of the filter 16, the fan assembly 18 and the remote-controlled air vents 42 can be carried out with the frame 58 already mounted in a wall 64. Indeed, the filter 16 and the components of the fan assembly 18 can be mounted in the respective seats of the air conveyor 14 through the windows 34, 36 of the profile 20 and the access openings 46, 48 of the air conveyor 14. Mounting of the components of the ventilation assembly 18 and the connections to the power supply are carried out by personnel qualified to carry out electrical operations.

[0017] As can be seen, the mounting procedure of the ventilation device according to the invention is divided into two steps. The first step is carried out in the workshop where the frames 58 are mounted, by the same personnel that carry out the assembly of the frames. The second step, which is carried out after the installation of the frames 58, is performed by personnel qualified to carry out electrical wiring.

[0018] This mounting procedure reduces the risk of damage to the filter 16 and the fan assembly 18 during the execution of the building works.

[0019] Figures 9 and 10 show the operation of the assembled ventilation device. The conveyor 14 is divided into an inlet chamber 66 and an outlet chamber 68. The filter 16 is mounted in the inlet chamber 66. The fan 38 generates an air flow F directed from the inlet chamber 66 towards the outlet chamber 68. The air flow F enters the air conveyor 14 through the inlet air vents 33 aligned with the slots 32 provided on the profile 20. The airflow F passes through the filter 16 and is sucked by the suction section of the fan 38. The airflow that leaves from the discharge section of the fan 38 is introduced into the internal environment through the opening 48 and the window 36. The airflow directed towards the internal environment also serves to cool the electronic board 40 and the power supply/ transformer 42 of the fan assembly 18.

[0020] The replacement or cleaning operations of the filter 16 and possible maintenance operations of the components of the fan assembly 18 are carried out through the windows 34, 36 of the casing 12, without removing the casing 12 from the frame 58.

[0021] Of course, without prejudice to the principle of the invention, the details of construction and the embod-

iments may vary widely with respect to those described and illustrated without departing from the scope of the invention as defined by the following claims.

Claims

1. A ventilation device for doors or windows, comprising an outer casing (12) in which a filter (16) and a fan assembly (18) are mounted,
characterized in that it comprises an air conveyor (14) mounted within said casing (12) and equipped with seats (50, 54) shaped to receive said filter (16) and said fan assembly (18), said air conveyor (14) having access openings (46, 48) facing at least one window (34, 36) of said outer casing (20) so that said filter (16) and said fan assembly (18) are mountable in said air conveyor (14) through said at least one window (34, 36) of the outer casing (12).

2. A ventilation device according to claim 1, **characterized in that** said outer casing (12) comprises a U-shaped profile (20) having a base wall (22), an inner front wall (24) and an outer front wall (26), said outer casing (12) also including a closure panel (28) applied to the ends of said front walls (24, 26) and two covers (30) applied to opposite ends of said profile (20).

3. A ventilation device according to claim 1 or claim 2, **characterized in that** said air conveyor (14) has an air inlet (70) facing a corresponding inlet opening (32) formed in said profile (20).

4. A ventilation device according to any one of the preceding claims, **characterized in that** said profile (20) has two access windows (34, 36) closed by respective doors (56, 58) .

FIG. 1

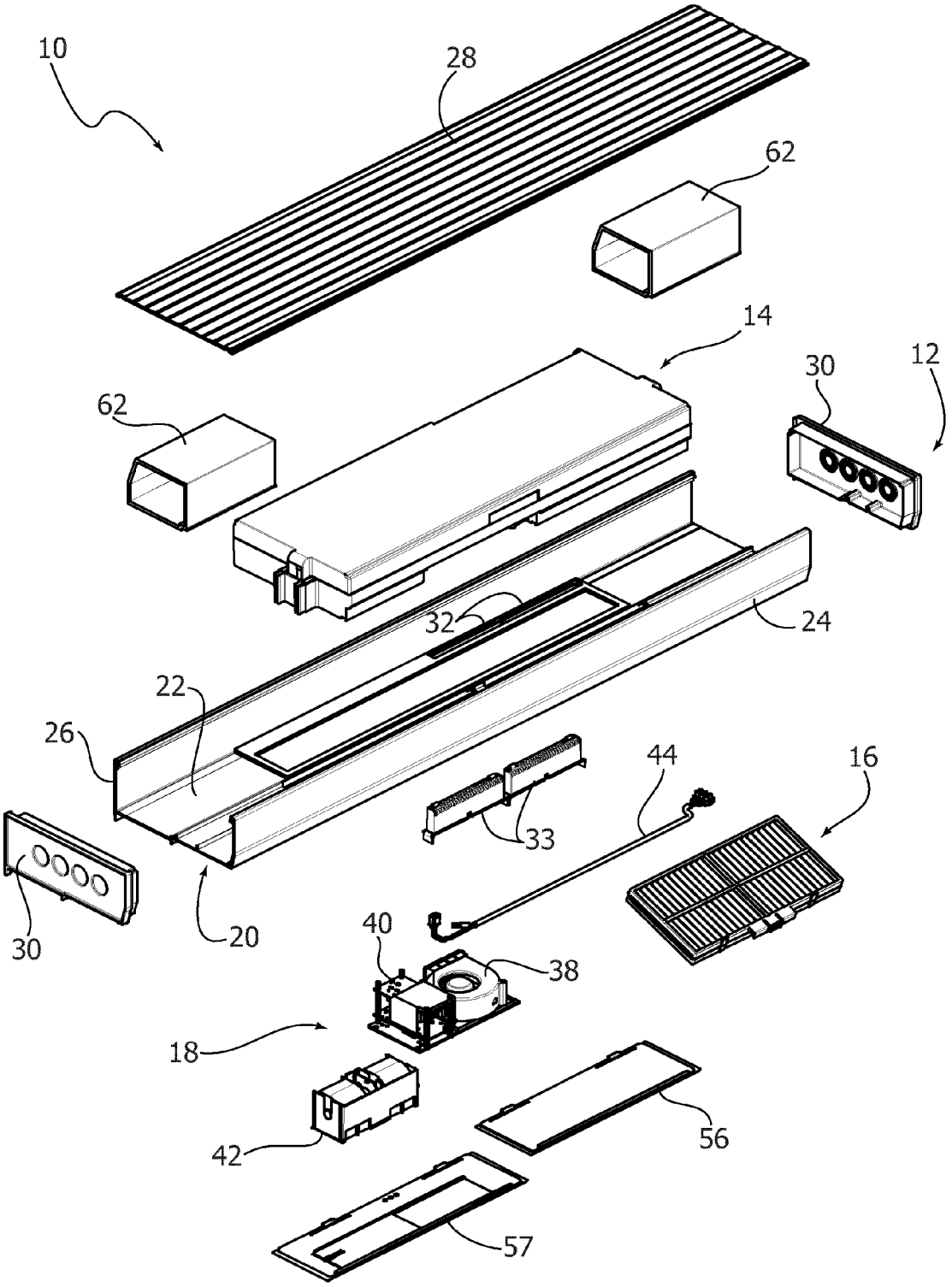

FIG. 2

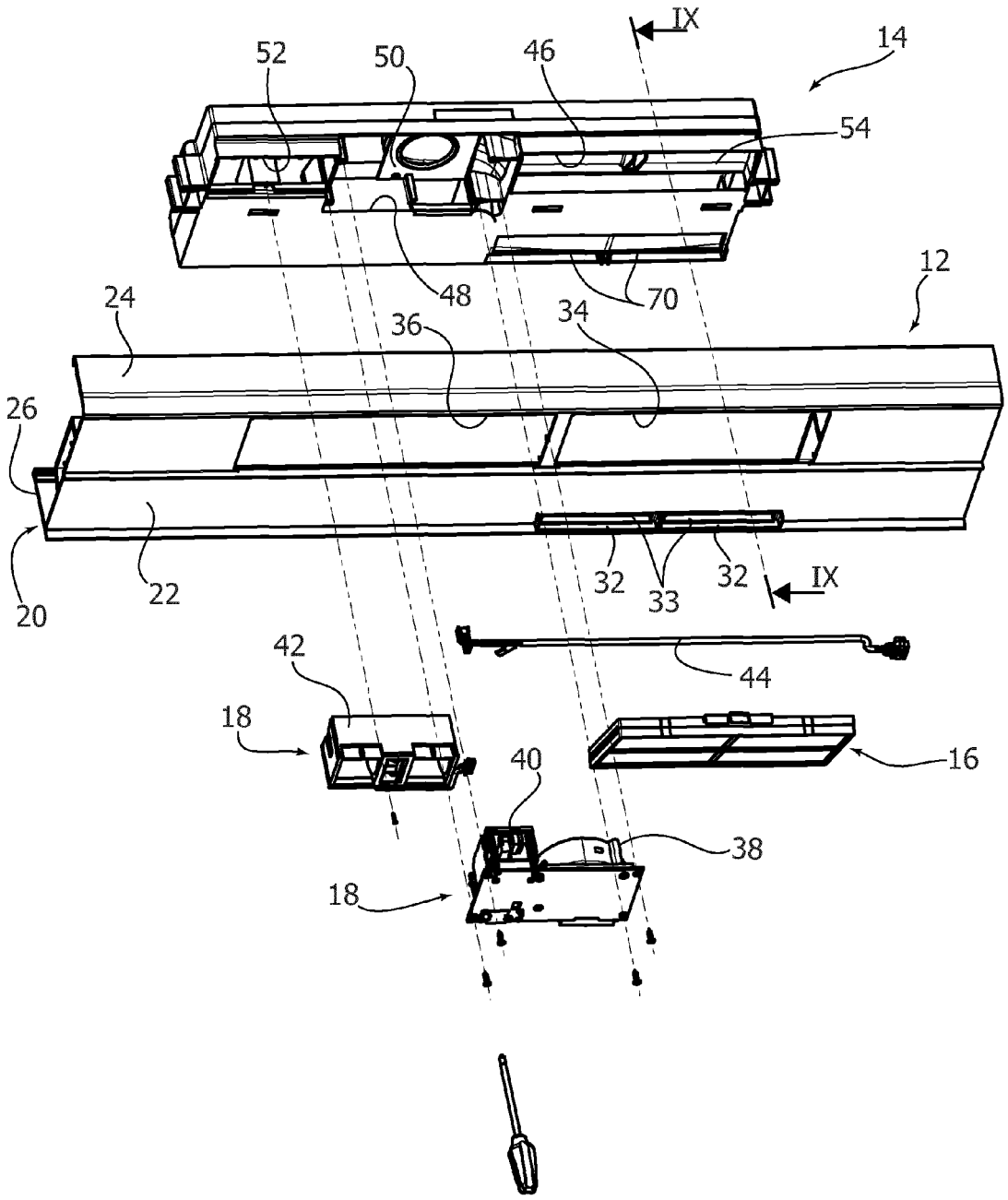
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FIG. 3

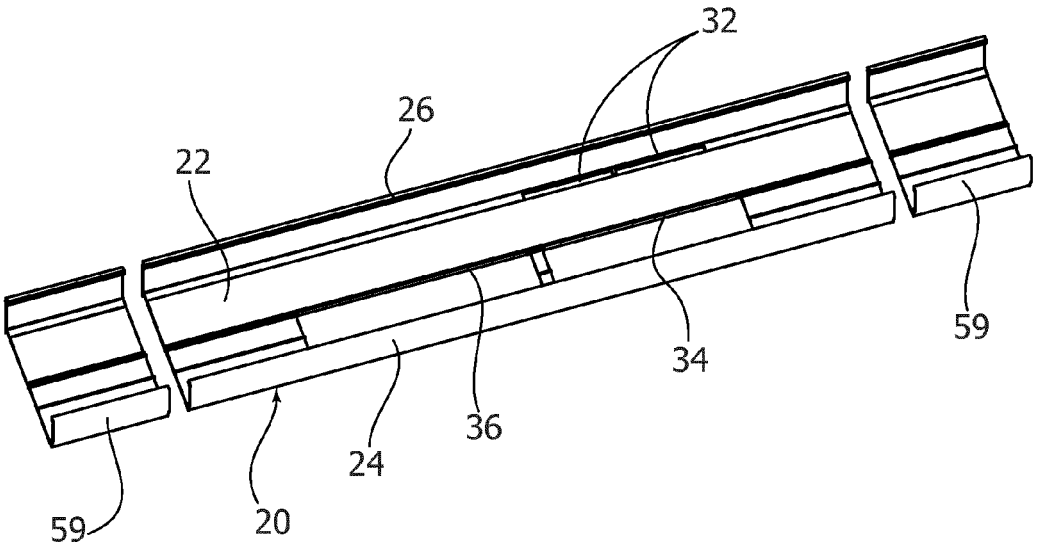


FIG. 4

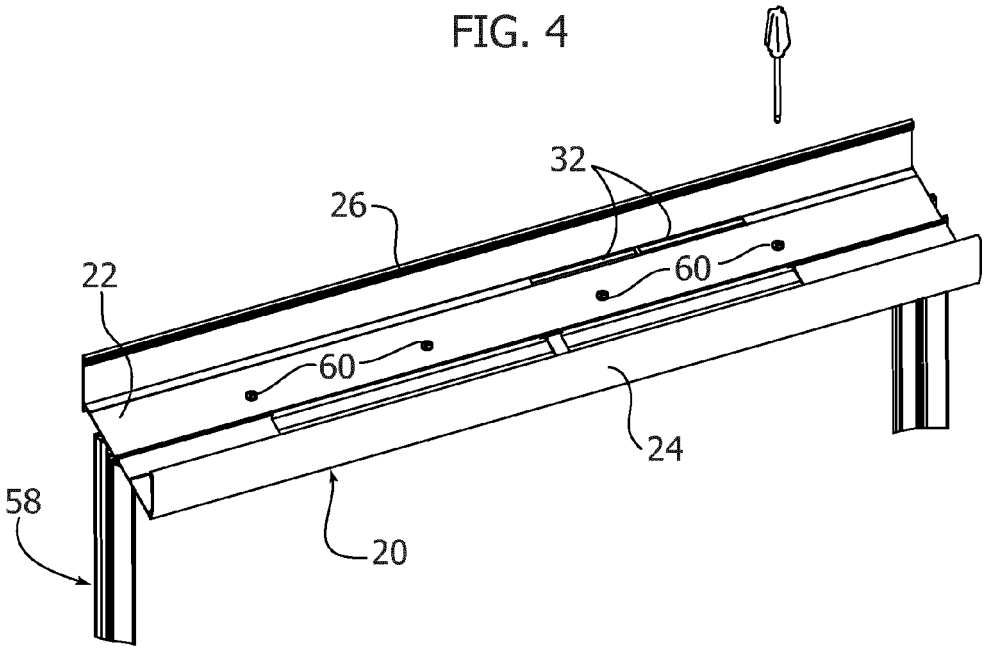


FIG. 5

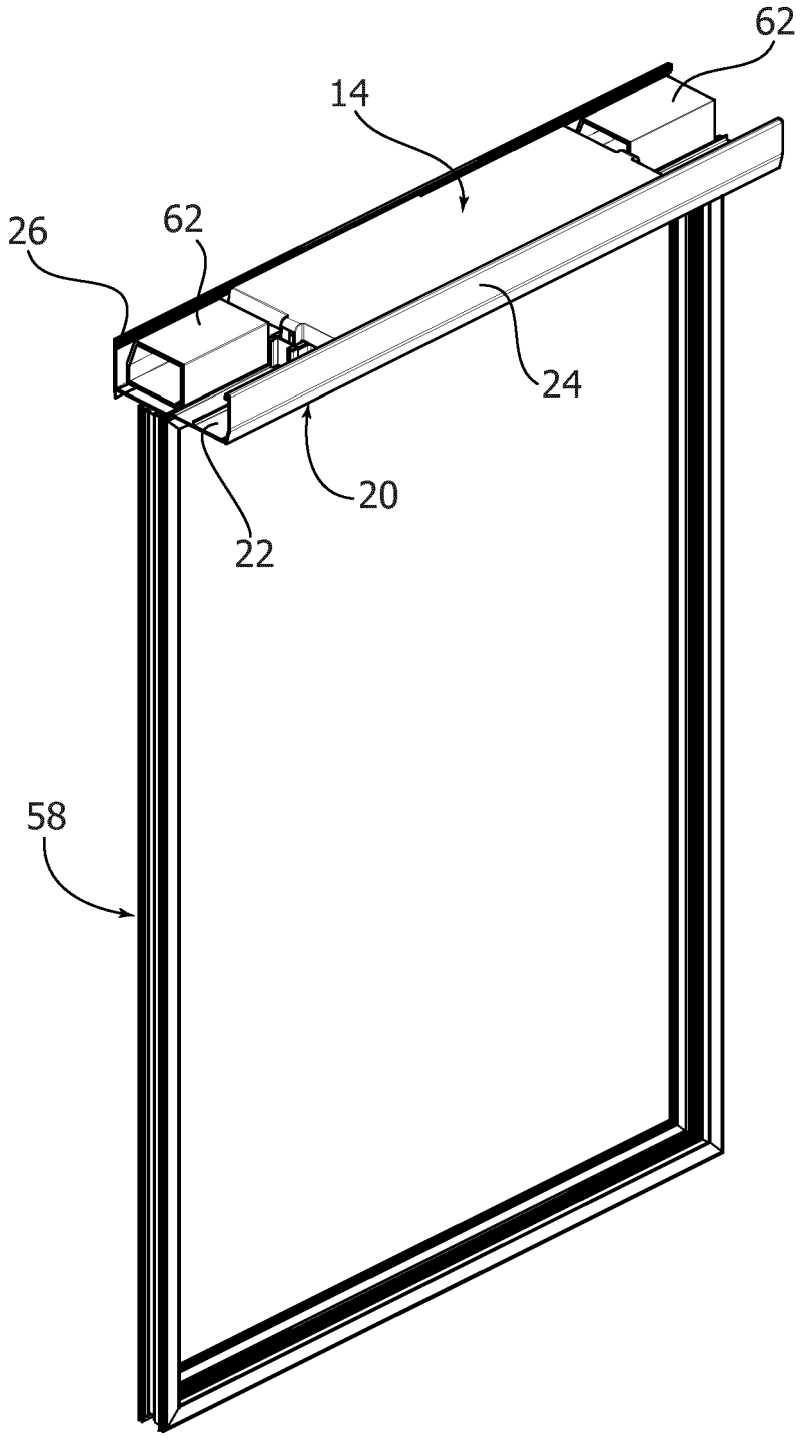


FIG. 6

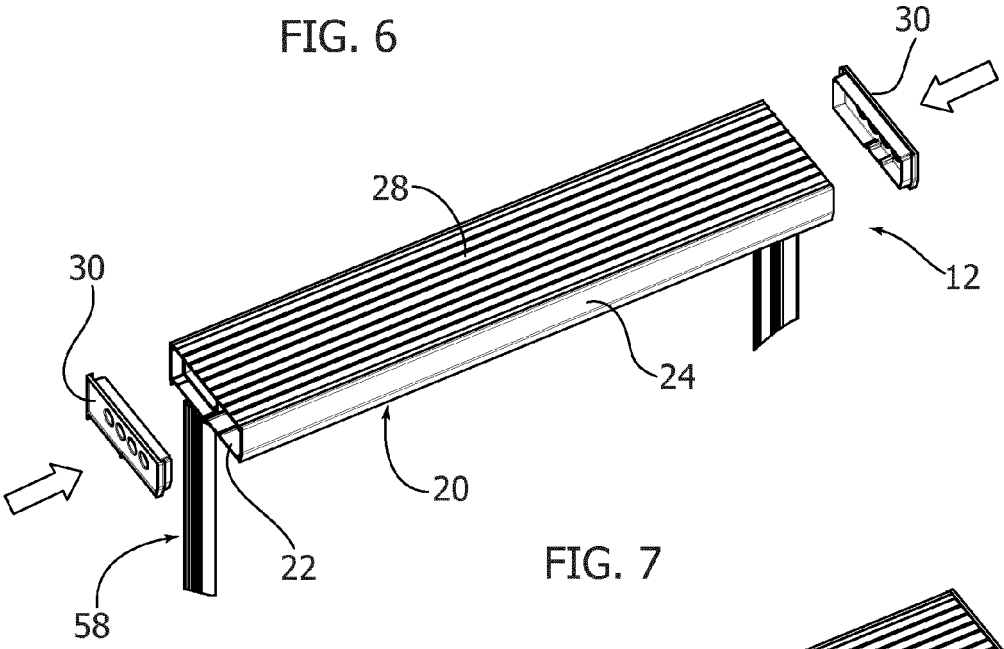


FIG. 7

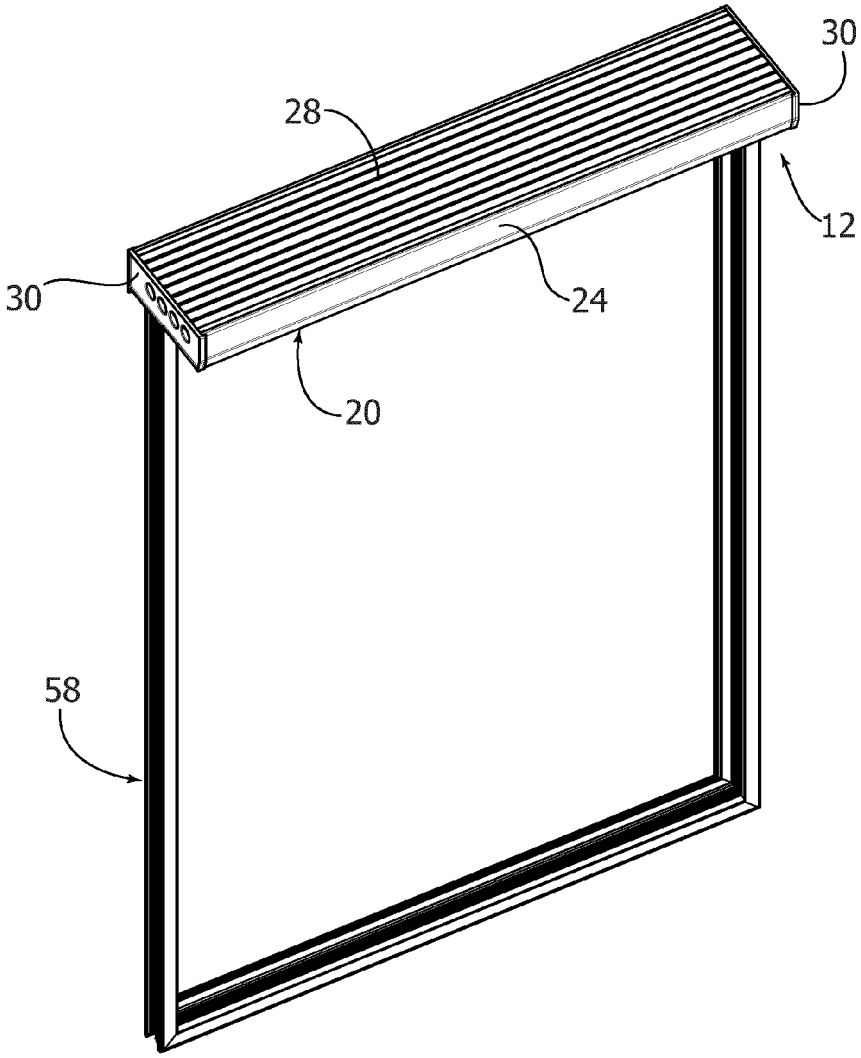


FIG. 8

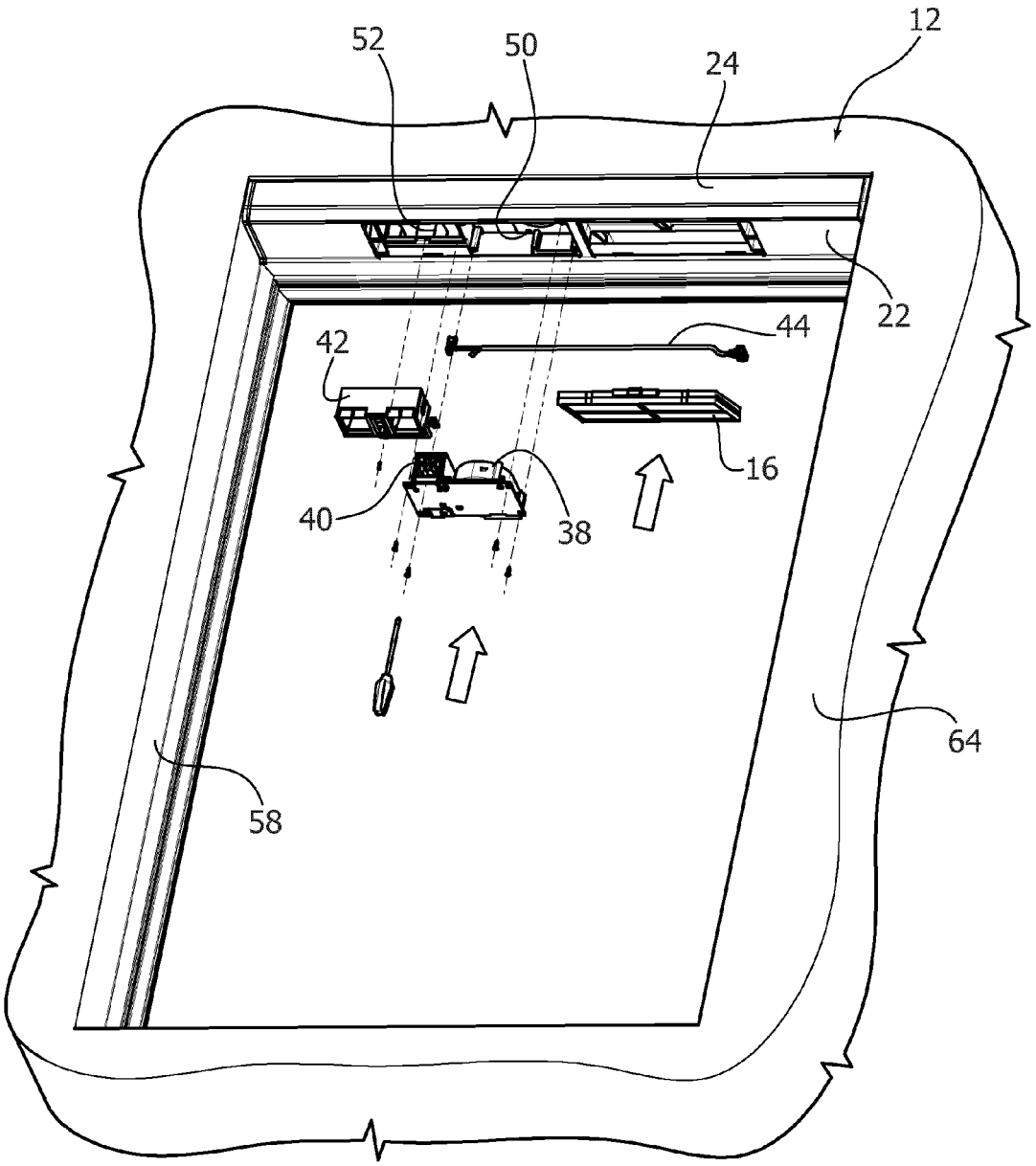


FIG. 9

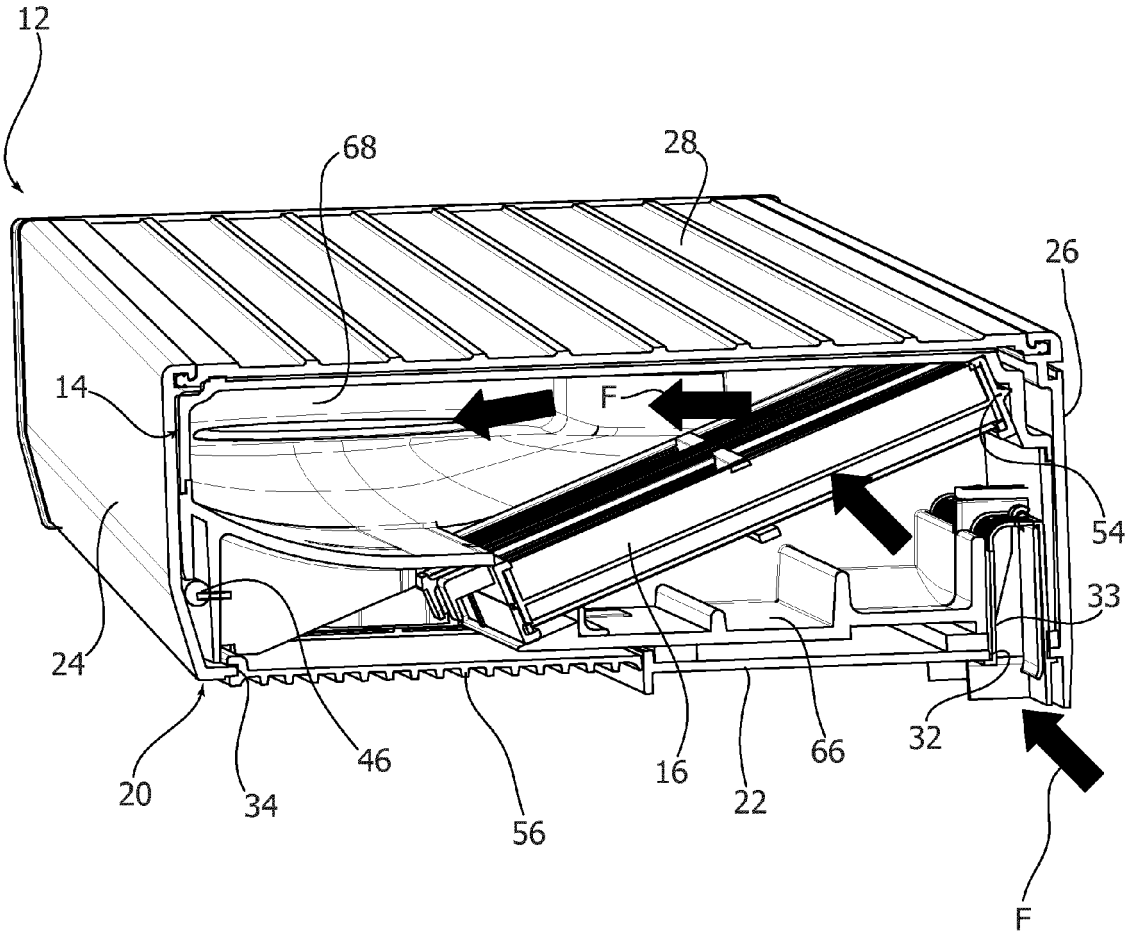
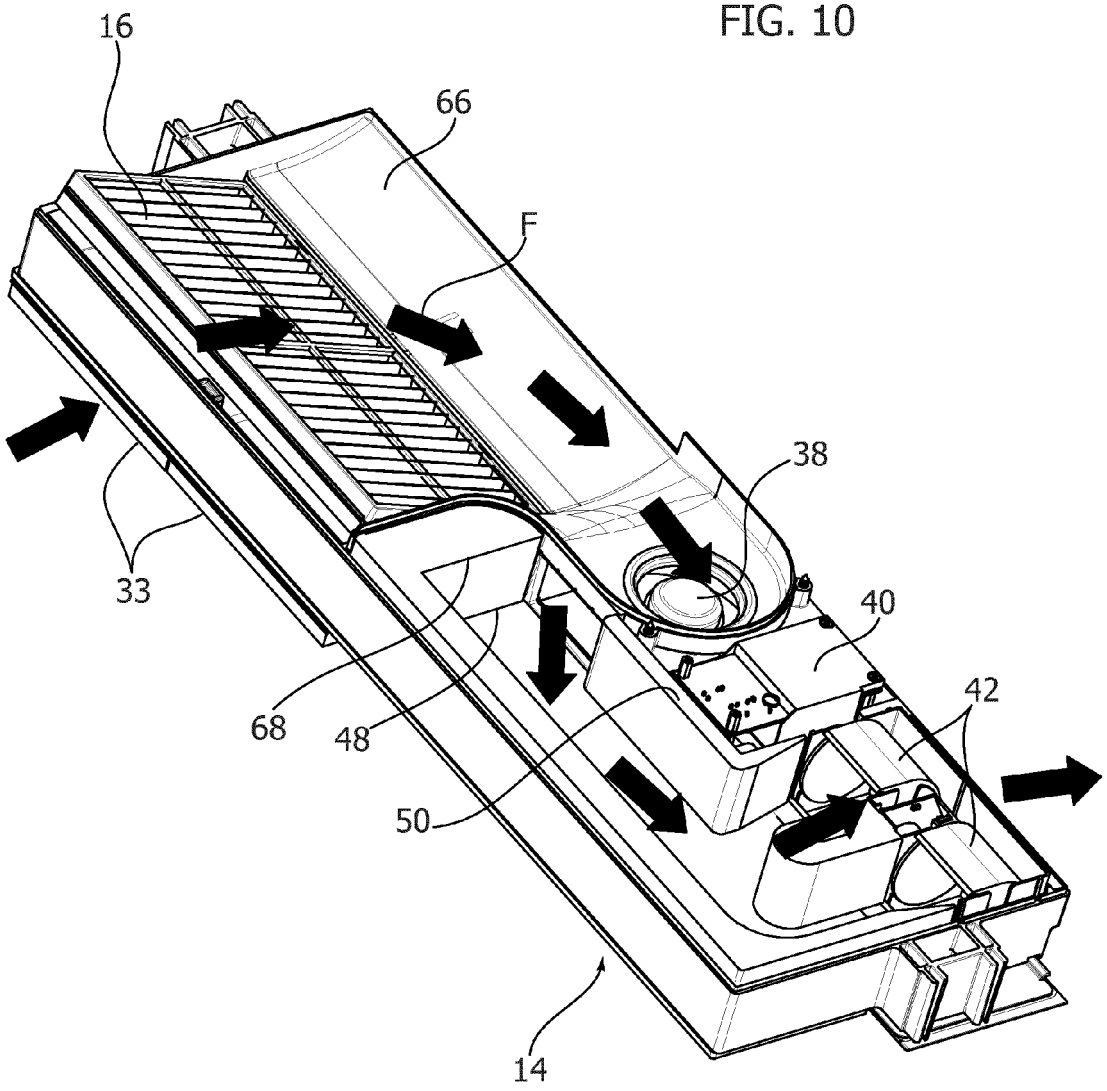


FIG. 10



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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 2154

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KR 100 622 111 B1 (KYUNGNAM ALUMINUM CO LTD [KR]) 19 September 2006 (2006-09-19) * figures 2,3 * -----	1-4	INV. E06B7/10

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	4 September 2014	Cornu, Olivier

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 17 2154

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04-09-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 100622111 B1	19-09-2006	NONE	

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