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## (54) Ventilation device

(57) The invention relates to a ventilation device (1) having a ventilation grille (4), having built-in profiles (7) for installation in a rebate (3), in which a ventilation duct (8) is joined to this ventilation grille (4). This ventilation device (1) is insulated sufficiently well, but can be adapted in a simple and inexpensive manner to be installed in rebates (3) of various widths, since the ventilation device (1) comprises an insulating panel (9) which extends across the surface of the ventilation grille (4) and has an opening (10) for installing the ventilation duct (8) therein, said insulating panel (9) being installed in the rebate (3) together with the built-in profiles (7).

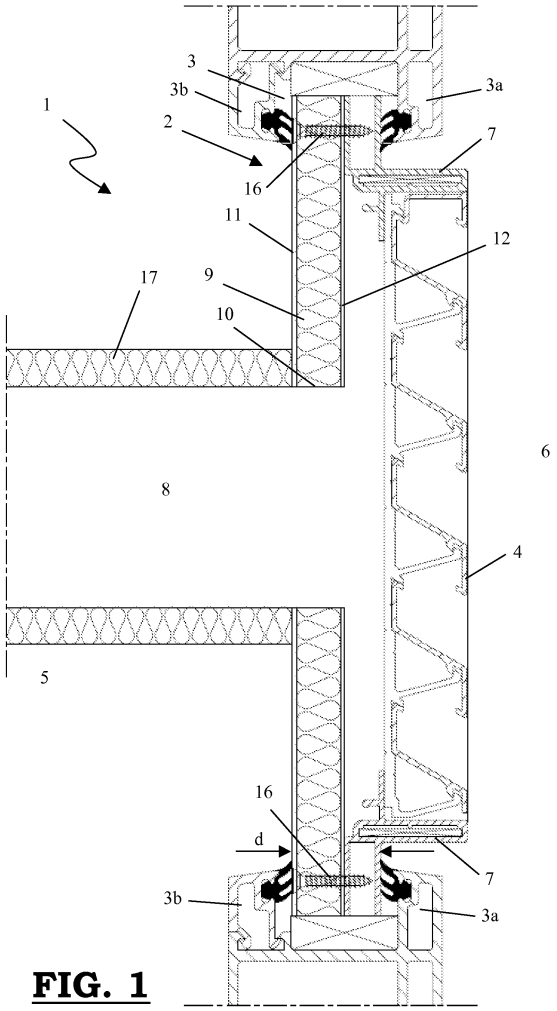


**FIG. 1**

EP 2 177 704 A2

## Description

**[0001]** The present invention relates to a ventilation device comprising a window opening provided with a rebate, a ventilation grille for the supply of air from an external space to an internal space and/or the discharge of air from the internal space to the external space, in which the ventilation grille is provided with one or more built-in profiles for installing the ventilation grille in the rebate and a ventilation duct which is designed to be joined to the ventilation grille along the internal space.

**[0002]** Ventilation grilles of this type are designed to be fitted in the rebate of a window opening instead of glazing. They are mainly used in large buildings which are provided with curtain walls, where a passage for air discharge ducts to the outside and/or air supply ducts to the inside has to be provided.

**[0003]** In the past, the one or more built-in profiles of these ventilation grilles were hardly thermally insulated, if at all, so that large heat losses could occur at the location of such a ventilation grille in a building during the winter period by means of transmission.

**[0004]** Nowadays, there are already embodiments of such ventilation grilles, in which plastic bridges are provided in the built-in profiles, so that thermal bridges can be reduced at the location where such a ventilation grille has been installed in a rebate. Such plastic bridges are also provided in the built-in profiles of windows for installation in such a rebate. Such plastic bridges are described, for example, in DE 103 00 864, GB 2,731,076 and FR 2,836,948. However, they are an expensive solution to prevent thermal bridges, both with regard to material and to production and finishing. In addition, they are even more expensive because of the fact that new built-in profiles and/or new plastic bridges have to be provided for each new width of rebate. In addition, the thermal insulation of these plastic bridges is also fairly limited. In order to further prevent thermal bridges when using these plastic bridges, the injection of additional thermal insulation in the built-in profiles is proposed, for example in DE 103 00 864, or a more complex design of the plastic bridges is proposed, such as in GB 2,731,076, which makes the production thereof even more expensive.

**[0005]** It is therefore an object of the present invention to provide a ventilation device which solves the above-mentioned problems and which also provides a ventilation device which is thermally well insulated against transfer of heat by means of transmission (heat loss or heat gain) and the occurrence of thermal bridges, which can be produced inexpensively and which can be adapted in an inexpensive and simple manner to rebates of various widths.

**[0006]** This object of the invention is achieved by providing a ventilation device, comprising

- a window opening provided with a rebate;
- a ventilation grille for the supply of air from an external space to an internal space and/or the discharge of air from the internal space to the external space, in which the ventilation grille is provided with one or more built-in profiles for installing the ventilation grille in the rebate;
- a ventilation duct designed to be joined to the ventilation grille along the internal space;

in which the ventilation device comprises an insulating panel, which is provided along the internal space across virtually the entire surface of the ventilation grille and which is provided with an opening for installing and/or connecting the ventilation duct thereto, and in which said insulating panel is designed to be installed in the rebate together with the one or more built-in profiles.

**[0007]** Such insulating panels can be produced less expensively than the known plastic bridges and, in addition, have a better thermal insulation value. By installing the insulating panel in the rebate together with the one or more built-in profiles, it is possible to ensure that cold downdraughts and/or condensation at the rebate are prevented. A significant additional advantage of the use of such an insulating panel is also that it can be ensured that no heat loss occurs across the surface of the ventilation grille next to the ventilation duct, since this ventilation duct will be fitted into an opening in the insulating panel which has been provided for this purpose. That part of the surface of the ventilation grille which cannot be used for ventilation in a useful manner is therefore insulated as well as possible, so that unnecessary heat transfer is avoided.

**[0008]** Preferably, the one or more built-in profiles are designed such that they extend only on one side of said insulating panel. Such a design of the one or more built-in profiles ensures quick installation of the ventilation device. In addition, such a simple construction also makes it possible to adapt the ventilation device to rebates of different widths even more easily, since it is only necessary to provide an insulating panel of a different width at the rebate in order to adapt the width of the entire ventilation device to the width of the rebate.

**[0009]** Furthermore, a ventilation device according to the present invention is preferably provided with a first cover plate on that side of the insulating panel which faces the internal space. In this manner, this cover plate protects the insulation of the insulating panel against influences from the internal space which could negatively affect the durability of this insulation. The insulating panel could equally well be provided with a protective layer or such a cover plate may be incorporated in the insulating panel at the surface of this insulating panel. In order to provide an aesthetically pleasing finish to the ventilation device, this cover plate may, for example, be made from the same material as the one or more built-in profiles or the rebate, or it may be given a matching appearance, etc.

**[0010]** A preferred embodiment of a ventilation device according to the present invention is furthermore provided with a cover film/foil on that side of the insulating panel

which is situated opposite the side which faces the internal space, again to protect the insulating panel against influences from the external space which could negatively affect the durability of this insulation. Preferably, this cover film/foil is impermeable to water, so that rainwater which falls, for example, onto the ventilation grille cannot permeate the insulation. Such rainwater may be discharged from the ventilation grille in any of the known manners via the rebate.

**[0011]** As an alternative for this cover film/foil or in addition thereto, this ventilation device may, according to the present invention, also be provided with a second cover plate on that side of the insulating panel which is opposite the side which faces the internal space. Again, the cover film/foil or the cover plate may be given a matching appearance so that the entire ventilation device forms an aesthetically pleasing unit.

**[0012]** In a particular embodiment of a ventilation device according to the present invention, the insulating panel is provided with a thickening at the location of the ventilation duct. In the installed position of the ventilation device, this thickening preferably extends outside the width of the rebate. Furthermore, in the installed position of the ventilation device, this thickening preferably extends inside the zone of the window opening delimited by the rebate on one side and the ventilation duct on the other side. The thickening of the insulating panel is preferably chosen such that the entire ventilation device is insulated as well as possible.

**[0013]** In a specific embodiment of a ventilation device according to the present invention, said one or more built-in profiles on the side of the insulating panel are of essentially flat design, in such a manner that the insulating panel can be joined onto these one or more built-in profiles as tightly as possible.

**[0014]** In a particularly preferred manner, in the installed position of the ventilation device, said one or more built-in profiles and said insulating panel together have a thickness in the rebate which is such that it essentially corresponds to the thickness of the glazing which is to be installed in such a rebate. The thickness of these one or more built-in profiles and of the insulating panel at the rebate therefore preferably matches standard thicknesses of glazing.

**[0015]** The present invention will now be described in more detail with reference to the following detailed description of some preferred embodiments of a ventilation device according to the present invention. The sole object of this description is to give illustrative examples and to indicate further advantages and particulars of these ventilation devices and can thus not be interpreted in any way as a limitation of the area of application of the invention or of the patent rights sought in the claims.

**[0016]** In this detailed description, reference numerals are used to refer to the attached drawings, in which

- **Fig. 1** shows a first embodiment of a ventilation device according to the present invention in cross section; and
- **Fig. 2** shows part of a second embodiment of a ventilation device according to the present invention in cross section.

**[0017]** The embodiments of ventilation devices (1) according to the present invention in each case comprise a window opening (2) provided with a rebate (3). Such a rebate (3) is usually, as illustrated in Fig. 1, delimited on one side by a stop (3a) and on the other side by a glass-retaining slat (3b), these being made of, for example, aluminium or PVC or wood. In Fig. 2, the window opening (2) with rebate (3), which is provided in order to install the illustrated ventilation grille (4), has not been shown.

**[0018]** In addition, these ventilation devices (1) are provided with a ventilation grille (4) for the supply of air from an external space (6) to an internal space (5) and/or the discharge of air from the internal space (5) to the external space (6), this ventilation grille (4) in each case being provided with built-in profiles (7) for installing this ventilation grille (4) in the rebate (3).

**[0019]** In addition, these ventilation devices (1) are provided with a ventilation duct (8), designed to be joined to the ventilation grille (4) along the internal space (5). This ventilation duct (8) is not shown in Fig. 2.

**[0020]** Furthermore, these ventilation devices (1) also comprise an insulating panel (9), which is provided along the internal space (5) across virtually the entire surface of the ventilation grille (4), which is provided with an opening (10) for installing and/or joining the ventilation duct (8) thereto, as is illustrated in Fig. 1, and which is designed to be installed in the rebate (3) together with the built-in profiles (7).

**[0021]** In this case, in the installed position of the ventilation device (1), the built-in profiles (7) and the insulating panel (9) preferably have a thickness (d) which is such that it essentially corresponds to the thickness of the glazing which is to be installed in this rebate (3). This thickness (d) preferably matches standard thicknesses of glazing, such as for example 24 mm, or 28 mm or 32 mm.

**[0022]** Such an insulating panel (9) may, for example, be made from PUR, PIR or PS. By installing the insulating panel (9) in the rebate (3) together with the built-in profiles (7), thermal bridges at this rebate (3) are avoided. Since the insulating panel (9) is furthermore provided across virtually the entire surface of the ventilation grille (4), as is illustrated for example in Fig. 1, i.e. in the space between the rebate (3) and the ventilation duct (8), it is possible to ensure that virtually no undesired heat transfer (loss or gain) occurs across this surface of the ventilation grille (4) next to the ventilation duct (8). The part of the surface of the ventilation grille (4) which is not effectively used for ventilation is therefore insulated as well as possible.

**[0023]** The insulating panel (9) from the embodiment (1) illustrated in Fig. 2 is provided with a thickening (14) which extends in the zone of the window opening (2)

delimited on one side by the rebate (3) and on the other side by the ventilation duct (8). In this case, in the installed position of the ventilation device (1), this thickening (14) extends outside the width of the rebate (3).

**[0024]** The built-in profiles (7) of the illustrated embodiments of ventilation devices (1) according to the present invention are designed in such a manner that they only extend on one side of said insulating panel (9). As a result thereof, the insulating panel (9) can quickly be installed in the rebate (3), together with these built-in profiles (7). By adjusting the thickness of the insulating panel (9), it is thus possible to also adapt the ventilation device (1) in a simple manner to different widths of rebates (3). The thickness (d) can thus be adapted to all kinds of desired thicknesses in a simple and inexpensive manner. Furthermore, the built-in profiles (7) on the side of the insulating panel (9) are of an essentially flat design, in such a manner that the insulating panel (9) can be joined to these built-in profiles (7) as tightly as possible.

**[0025]** Both the embodiments (1) from Fig. 1 and from Fig. 2 are provided with a first cover plate (11) on that side of the insulating panel (9) which faces the internal space. This first cover plate (11) may, for example, be a metal or wooden plate. In this manner, the insulation of the insulating panel (9) is protected by this cover plate (11) against influences from the internal space (5) which could negatively affect the durability of the insulation. The insulating panel (9) itself could equally well be provided with a protective layer or such a cover plate (11) may be incorporated into the insulating panel (9) on the surface of this insulating panel (9). In order to provide an aesthetically pleasing finish to the ventilation device (1), this cover plate (11) may, for example, be made from the same material as the built-in profiles (7) or the glass-retaining slat (3b) or the stop (3a), or it may be given a matching appearance, etc.

**[0026]** The embodiment of a ventilation device (1) according to the present invention illustrated in Fig. 1 is provided with a cover film/foil (12) on that side of the insulating panel (9) which is situated opposite the side which faces the internal space (5). The embodiment (1) illustrated in Fig. 2 is provided with a second cover plate (13) on that side of the insulating panel (9) which is situated opposite the side which faces the internal space (5). This cover film/foil (12) and this cover plate (13) are provided to protect the insulating panel (9) against influences from the external space (6) which could negatively affect the durability of this insulation. Preferably, said cover film/foil (12) and said second cover plate (13) are impermeable to water, so that, for example, rainwater which falls onto the ventilation grille cannot permeate the insulating panel (9). Such rainwater may be discharged from the ventilation grille (4) in any of the known manners via the rebate (3). Furthermore, the cover film/foil (12) or the cover plate (13) may be provided with a matching exterior in order to match the ventilation device (1) aesthetically. The second cover plate (13) may, for example, be a metal or wooden plate, just like the first cover plate (11).

**[0027]** As is illustrated in Figs. 1 and 2, the first cover plate (11), the insulating panel (9) and the second cover plate (13) or the cover film/foil (12) may be attached to the built-in profiles (7), for example by means of screws (16), before they are installed in the rebate (3) together with these built-in profiles (7). These (9, 11, 13 or 12 and 7) could, however, also be bonded to one another before being installed in the rebate (3) or could be attached to one another by means of any other attachment method. Such an attachment is not necessary and could equally well be omitted. However, such an attachment facilitates the joint installation of these components (9, 11, 13 or 12 and 7) of the ventilation device (1) in the rebate (3) of this ventilation device (1).

**[0028]** Furthermore, it may be indicated to also provide the ventilation duct (8) of this ventilation device (1) with the necessary insulation, such as for example with the illustrated duct insulation (17) from Fig. 1.

## Claims

**1.** Ventilation device (1), comprising

- a window opening (2) provided with a rebate (3);
- a ventilation grille (4) for the supply of air from an external space (5) to an internal space (6) and/or the discharge of air from the internal space (6) to the external space (5), in which the ventilation grille (4) is provided with one or more built-in profiles (7) for installing the ventilation grille (4) in the rebate (3);
- a ventilation duct (8) which is designed to be joined to the ventilation grille (4) along the internal space (5);

**characterized in that** the ventilation device (1) comprises an insulating panel (9), which is provided along the internal space (5) across virtually the entire surface of the ventilation grille (4) and which is provided with an opening (10) for installing and/or joining the ventilation duct (8) thereto, in which said insulating panel (9) is designed to be installed in the rebate (3) together with the one or more built-in profiles (7).

**2.** Ventilation device (1) according to Claim 1, **characterized in that** the one or more built-in profiles (7) are designed such that they extend only on one side of said insulating panel (9).

**3.** Ventilation device (1) according to Claim 1 or 2, **characterized in that** it is provided with a first cover plate (11) on that side of the insulating panel (9) which faces the internal space (5).

**4.** Ventilation device (1) according to one of the preceding claims, **characterized in that** it is provided

with a cover film/foil (12) on that side of the insulating panel (9) which is situated opposite the side which faces the internal space (5).

**5.** Ventilation device (1) according to one of the preceding claims, **characterized in that** it is provided with a second cover plate (13) on that side of the insulating panel (9) which is opposite the side which faces the internal space (5).

**6.** Ventilation device (1) according to one of the preceding claims, **characterized in that** the insulating panel (9) is provided with a thickening (14) at the location of the ventilation duct (8).

**7.** Ventilation device (1) according to Claim 7, **characterized in that**, in the installed position of the ventilation device (1), the thickening (14) extends outside the width of the rebate (3).

**8.** Ventilation device (1) according to Claim 6 or 7, **characterized in that**, in the installed position of the ventilation device (1), the thickening (14) extends inside the zone of the window opening (2) delimited by the rebate (3) on one side and the ventilation duct (8) on the other side.

**9.** Ventilation device (1) according to one of the preceding claims, **characterized in that** said one or more built-in profiles (7) on the side of the insulating panel (9) are of essentially flat design.

**10.** Ventilation device (1) according to one of the preceding claims, **characterized in that**, in the installed position, said one or more built-in profiles (7) and said insulating panel (9) together have a thickness (d) in the rebate (3) which is such that it essentially corresponds to the thickness of the glazing which is to be installed in such a rebate (3).

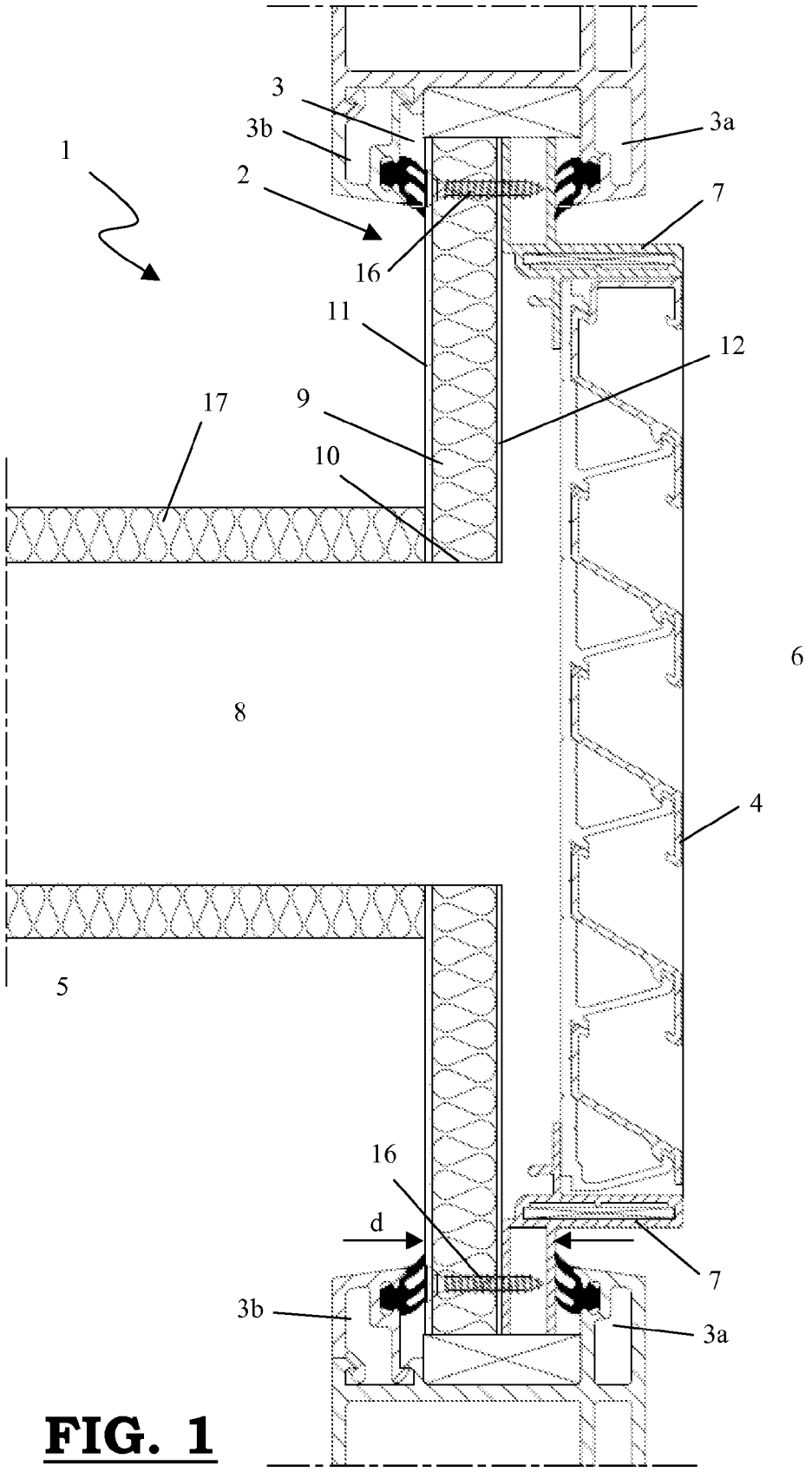


FIG. 1

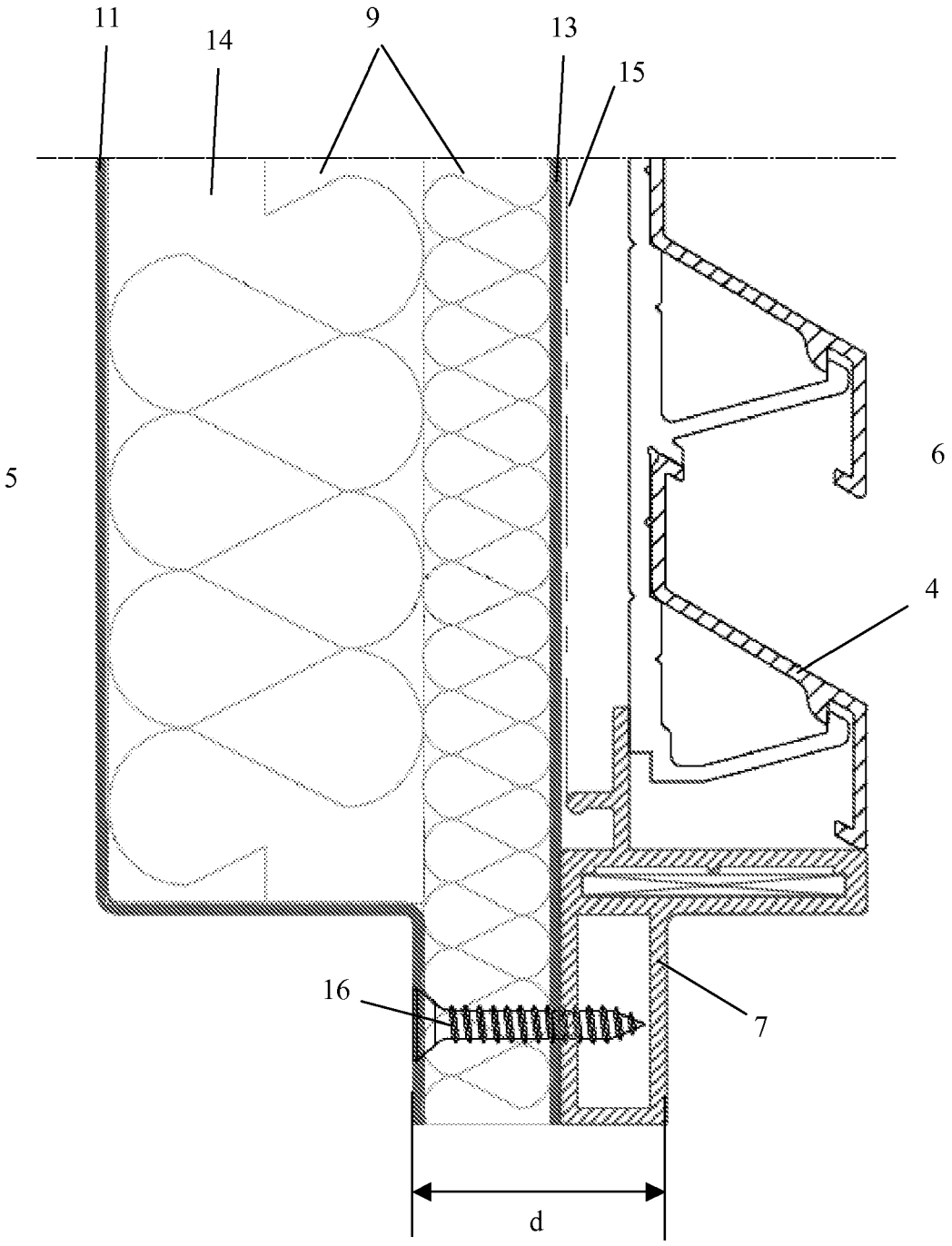


FIG. 2

## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


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- GB 2731076 A **[0004]**
- FR 2836948 **[0004]**