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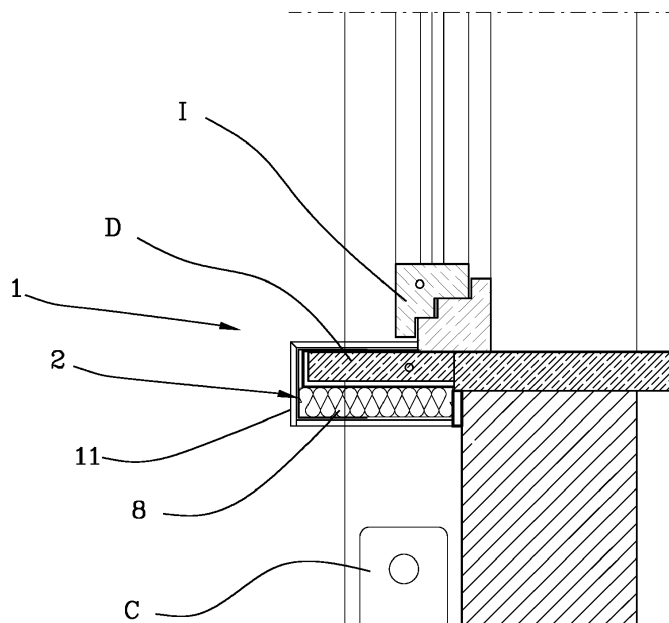
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THERMAL INSULATION DEVICE FOR AN INTERIOR WINDOWSILL OF A ROOM AND METHOD FOR THERMALLY INSULATING AN INTERIOR WINDOWSILL OF A ROOM
- (57)

A thermal insulation device (1) for an interior windowsill of a room configured to be connected or connectable to an interior windowsill (D) of a room to limit a heat flow between an environment inside the room and an environment outside the room through the windowsill (D). The thermal insulation device (1) comprises at least one connection body (2) defining a housing (3) adapted to receive at least partially therein at least a portion of the

windowsill (D) to connect the thermal insulation device (1) to the windowsill (D). Furthermore, the thermal insulation device (1) comprises at least one insulating element (7) configured to provide at least a partial thermal insulation of the windowsill (D). In particular, the at least one insulating element (7) is at least partially housed in the housing (3) so as to provide at least a partial thermal insulation of the windowsill (D).
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- Fig. 1B
- Processed by Luminess, 75001 PARIS (FR)
- EP 4 474 607 A1

Description

[0001] The present invention relates to a thermal insulation device for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room.

[0002] In particular, the present invention falls within the technical field of devices aimed at increasing the energy efficiency of a building and, more specifically, limiting the heat loss thereof.

[0003] Heat loss, e.g., through windowsills, strongly influences the energy efficiency of buildings and the thermal comfort of occupants.

[0004] In fact, the flow of heat through windowsills causes increased costs related to heating during cold periods of the year and to cooling during hot periods.

[0005] Furthermore, heat loss can lead to the formation of condensation and the appearance of mould, with consequent damage and health risks for occupants.

[0006] Nowadays, it is common practice to arrange heaters (or radiators) below windowsills so as to reduce the size thereof inside rooms.

[0007] However, such a placement has the considerable disadvantage of having a strong negative impact on the energy efficiency of the building. In fact, the limited thickness of the perimeter wall under the window, together with the presence of an interior windowsill, generally made of marble, determines a significant thermal bridge with the external environment and leads to a sharp increase in heat loss.

[0008] In order to overcome such a problem, insulation interventions are generally carried out on the outer surface of the building, e.g., by means of the installation of external insulation or the like.

[0009] Disadvantageously, such interventions are highly invasive, going to completely alter the facade of the building.

[0010] Furthermore, the installation of external insulation requires a large economic investment which is very often not sustainable by the occupants. In this context, the task of the present invention is to provide a thermal insulation device for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room capable of overcoming the drawbacks shown by the prior art.

[0011] In particular, an object of the present invention is to propose a thermal insulation device for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room which allows energy efficiency to be achieved without the need to carry out interventions on the outer façade of the building.

[0012] A further object of the present invention is to propose a thermal insulation device for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room capable of simplifying the installation procedures and which does not require the intervention of skilled workers.

[0013] A further object of the present invention is to

provide a thermal insulation device for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room which allow to minimise the thermal bridging without requiring the demolition and/or replacement of the interior windowsills of the building.

[0014] A further object of the present invention is to propose a thermal insulation device for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room having marked operational flexibility and adaptability.

[0015] The specified objects are substantially achieved by a device for thermal insulation for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room, which comprise the technical features set forth in one or more of the appended claims.

[0016] The dependent claims correspond to possible embodiments of the invention.

[0017] Additional features and advantages of the present invention will become more apparent from the approximate, and thus non-limiting, description of a preferred but not exclusive embodiment of a device for thermal insulation for an interior windowsill of a room and a method for thermally insulating an interior windowsill of a room, as illustrated in the accompanying drawings, in which:

- figures 1A, 2A, 3A are side views of a thermal insulation device for an interior windowsill in accordance with respective possible embodiments of the present invention;
- figures 1B, 2B, 3B are sectional views in accordance with possible operating conditions of the thermal insulation device for an interior windowsill of a room of figures 1A, 2A, 3A.

[0018] With reference to the accompanying figures, the reference number 1 has been used to generally designate a thermal insulation device for an interior windowsill of a room, which will be referred to herein as device 1.

[0019] The device 1 is configured to be connected or connectable to an interior windowsill "D" of a room to limit a heat flow between an environment inside the room and an environment outside the room through the windowsill "D".

[0020] The device 1 comprises at least one connection body 2 defining a housing 3 adapted to receive at least partially therein at least a portion of the windowsill "D" to connect the device 1 to the windowsill "D".

[0021] In particular, the housing 3 can at least partially define an inner surface 20 of the connection body 2.

[0022] In accordance with a possible embodiment which is purely illustrative and not limiting, the device 1 can comprise a plurality of connection bodies 2 aligned or alignable along a longitudinal direction. In particular, each connection body 2 can define a respective housing adapted to receive at least partially therein at least a por-

tion of the windowsill "D" to connect the device to the windowsill "D".

[0023] Thereby, the plurality of connection bodies 2 allows to adapt the device 1 to windowsills of different sizes, giving the device 1 marked adaptability and operational flexibility.

[0024] Advantageously, the at least one connection body 2 can have a substantially "C-shaped" cross section, which facilitates the connection of the device 1 to the windowsill "D".

[0025] In accordance with a possible embodiment and as illustrated in the appended figures, the connection body 2 can comprise a first wing 4 and a second wing 5.

[0026] Purely by way of non-limiting example, the first wing 4 and the second wing 5 can be parallel to each other.

[0027] For example, the first wing 4 can have a length comprised between 60 and 90 mm and/or the second wing 5 can have a length comprised between 60 and 90 mm.

[0028] Furthermore, the first wing 4 can have a length substantially equal to that of the second wing 5 (as illustrated in figures 1A, 1B, 2A, 2B) or less than that of the second wing 5 (as illustrated in figures 3A, 3B) or more than that of the second wing 5 (not illustrated in the accompanying figures). Furthermore, the connection body 2 can comprise a core 6 adapted to connect the first wing 4 and the second wing 5.

[0029] In particular, the first wing 4, the second wing 5 and/or the core 6 can be operatively connected to at least partially define the housing 3. Advantageously, the connection body 2 can further comprise at least one lateral closing element (not illustrated in the accompanying figures) extending substantially perpendicularly to the first wing 4, the second wing 5 and the core 6. Preferably, the lateral closing element can have a substantially plate-like conformation. For example, the lateral closing element can be connected to the first wing 4, the second wing 5 and/or the core 6 by means of bonding and/or form-fitting and/or the like.

[0030] Thereby, the lateral closing element lends particular mechanical rigidity to the connection body 2.

[0031] Furthermore, the lateral closing element can define, together with the first wing 4, the second wing 5 and the core 6, a substantially box-like structure adapted to contain at least partially the portion of the windowsill which exits with respect to the edge of the inner wall.

[0032] In accordance with a possible embodiment and as illustrated in the accompanying figures, the first wing 4, the second wing 5 and the core 6 can be made in a single piece. In such a case, the at least one connection body 2 can be, for example, at least partially made of steel and/or plastic and/or the like.

[0033] In accordance with further possible embodiments not illustrated in the accompanying figures, the first wing 4, the second wing 5 and the core 6 can be made from single pieces which are independent of each other and can be connected by a pair of lateral closing

elements arranged facing each other at opposite longitudinal ends of the connection body 2. Thereby, the lateral closing elements assume a strongly structural function, which enables the entire connection body 2 to be kept assembled. In such a case, the first wing 4, the second wing 5 and/or the core 6 can, for example, be at least partially made of stoneware and/or wood and/or the like.

[0034] Furthermore, the lateral closing elements can be made at least partially of the same material used for the first wing 4, the second wing 5 and/or the core 6, or of alternative materials, for example, metal and/or polymeric materials, providing a marked operating flexibility to the connection body 2. According to an advantageous aspect of the present invention, the first wing 4 can, in use, be arranged below the second wing 5.

[0035] As illustrated in figures 1B, 2B, 3B the first wing 4 and the second wing 5 can be, in use, facing the lower surface of the windowsill and an upper surface of the windowsill "D", respectively.

[0036] Advantageously, the device 1 comprises at least one insulating element 7 configured to provide at least a partial thermal insulation of the windowsill "D".

[0037] In particular, the device 1, thanks to the presence of the insulating element 7, can allow a marked reduction in thermal conductivity, succeeding, for example, in lowering the surface temperature of the windowsill "D" to which it is applied by at least 3 degrees centigrade with respect to the windowsills of the prior art.

[0038] Preferably, the at least one insulating element 7 can be made at least partially of polystyrene and/or other similar insulating materials.

[0039] In particular, the at least one insulating element 7 is at least partially housed in the housing 3 so as to provide at least a partial thermal insulation of the windowsill "D".

[0040] Preferably, the at least one insulating element 7 can at least partially cover an inner surface 20 of the connection body 2 and, thus, of the housing 3. That is, the insulating element 7 can at least partially cover the connection body 2 internally.

[0041] Furthermore, the at least one insulating element 7 can be at least partially bonded to at least one inner surface 20 of the connection body 2 and, thus, of the housing 3 ensuring an adequate positioning and an effective thermal insulation of the windowsill "D".

[0042] Preferably, the at least one insulating element 7 can comprise at least one lower element 8 and/or at least one upper element 9 and/or at least one head element 10 respectively configured to at least partially cover the first wing 4 and/or the second wing and/or the core 6. In particular, the at least one lower element 8 and/or the at least one upper element 9 and/or the at least one head element 10 can be at least partially housed in the housing 3.

[0043] Advantageously, the at least one insulating element 7 can comprise at least one lower insulating element 8 configured to at least partially cover the first wing 4.

[0044] Thereby, the lower element 8 can ensure an effective thermal insulation between a heater "C" and the windowsill to which it is interposed.

[0045] Purely by way of non-limiting example, the at least one lower element 8 can have a thickness comprised between 5 mm and 50 mm, preferably comprised between 15 mm and 40 mm, even more preferably equal to 30 mm.

[0046] For example, the lower element 8 can have a length substantially equal to that of the first wing 4 (as illustrated in figures 3A, 3B) or greater than that of the first wing 4 (as illustrated in figures 1A, 1B, 2A, 2B) or less than that of the first wing 4 (not illustrated in the accompanying figures), thus providing a marked operational flexibility to the device 1.

[0047] Advantageously, the at least one insulating element 7 can further comprise at least one upper element 9 configured to at least partially cover the second wing 5.

[0048] In particular, the second wing 5 and/or the upper element 9 can be, in use, at least partially interposed between the windowsill "D" and a frame "I" of a window above the windowsill "D" so as to minimise the heat loss of the building.

[0049] For example, the at least one upper element 9 can have a thickness comprised between 1 mm and 30 mm, preferably comprised between 5 mm and 20 mm, even more preferably equal to 10 mm.

[0050] For example, the upper element 9 can have a length substantially equal to that of the second wing 5 (not illustrated in the accompanying figures) or greater than that of the second wing 5 (as illustrated in figures 2A, 2B, 3A, 3B) or less than that of the first wing 4 (not illustrated in the accompanying figures) or not be present (as illustrated in figures 1A, 1B) without altering the inventive concept underlying the present invention.

[0051] Furthermore, the at least one insulating element 7 can comprise at least one head element 10 configured to at least partially cover the core 6, minimising the thermal bridging which induces heat loss between the internal environment and the external environment of the building.

[0052] In particular, the at least one head element 10 can have a thickness comprised between 5 mm and 35 mm, preferably comprised between 10 mm and 30 mm, even more preferably equal to 20 mm.

[0053] According to further possible embodiments and as illustrated in figures 1A, 1B the head element 10 may not be present without altering the inventive concept underlying the present invention.

[0054] Furthermore, the at least one insulating element 7 can comprise at least one lateral insulating element (not illustrated in the accompanying figures) configured to at least partially cover the aforementioned lateral closing elements so as to further reduce the heat loss between the internal environment and external environment of the building.

[0055] Preferably, the at least one insulating element 7, for example the lower element 8 and/or the upper el-

ement 9 and/or the head element 10, can at least partially have the conformation of a panel.

[0056] In accordance with a possible embodiment, the at least one insulating element 7 can at least partially have a rigid and/or semi-rigid conformation. Furthermore, the at least one insulating element 7 can at least partially have a flexible conformation so as to ensure an effective filling of the housing 3.

[0057] Advantageously, the at least one insulating element 7 can have heat-reflecting properties and/or be made at least partially of heat-reflecting material so as to optimise the insulation of the windowsill "D".

[0058] Preferably, the device 1 can comprise at least one covering element 11 suitable for at least partially covering at least one outer surface 30 of the connection body 2 connecting to the housing 3.

[0059] That is, the covering element 11 at least partially externally covers the connection body 2.

[0060] Preferably, at least one covering element 11 is made at least partially of stoneware and/or wood and/or the like, ensuring that the device 1 is highly resistant to impact, wear and abrasion.

[0061] The at least one covering element can have a plate-like conformation, ensuring a reduced transverse size of the device 1.

[0062] Purely by way of non-limiting example, the at least one covering element 11 can have a thickness comprised between 6 mm and 20 mm.

[0063] Purely by way of example and as illustrated in the accompanying figures, the covering element 11 can extend beyond the first wing 4 and/or the second wing 5, ensuring an effective protection against impact and damage of various kinds to the lower element 8 and/or the upper element 9, respectively.

[0064] In accordance with a further aspect, the present invention relates to a method for thermally insulating an interior windowsill of a room comprising the steps of providing a connection body connectable to a windowsill, inserting at least one insulating element in the connection body and connecting the connection body to the interior windowsill of a room. Advantageously, the step of connecting the connection body to the windowsill can comprise the sub-step of at least partially inserting the windowsill into the connection body.

[0065] In particular, the step of connecting the connection body to the windowsill is carried out in such a way that the at least one insulating element is disposed, when in use, facing at least one surface of the windowsill. Furthermore, the method can comprise a step of applying, preferably bonding, the at least one insulating element and/or the at least one covering element to the connection body.

[0066] Advantageously, the method can comprise a step of providing a thermal insulation device for an interior windowsill of a room in accordance with the above and/or the step of carrying out at least one step of the aforesaid method by means of the device 1.

[0067] Preferably, the method can comprise a step of

sizing, e.g., cutting to appropriate size, the at least one insulating element and/or the at least one covering element and/or the at least one connection body so as to adapt them to the specific operational requirements.

[0068] For example, slabs of stoneware and/or insulating material with lengths of 300 centimetres or more can be dimensioned for this purpose by means of simple tools.

[0069] Advantageously, such a step can be carried out at least partially on site, overcoming the need for the use of specialised operators.

[0070] Therefore, it is noted that the present invention achieves the proposed objects by making a thermal insulation device for an interior windowsill of a room which enables energy efficiency to be achieved without the need to carry out interventions on the outer façade of the building thanks to the presence of an insulating element housed inside a connection body connecting the device to the windowsill and configured to achieve a thermal insulation of the windowsill.

[0071] Furthermore, the thermal insulation device and the thermal insulation method allow to minimise thermal bridging without requiring the demolition and/or replacement of the interior windowsills of the building. Advantageously, the thermal insulation device and the thermal insulation method simplify the installation procedures and do not require the intervention of skilled workers.

[0072] Advantageously, the thermal insulation device can be substantially self-supporting and specifically made for the particular windowsill to which it is applied, ensuring a high level of thermal insulation together with a prolonged service life, while at the same time defining a fine aesthetic finish for the room within which it is used.

Claims

1. A thermal insulation device (1) for an interior windowsill of a room configured to be connected or connectable to an interior windowsill (D) of a room to limit a heat flow between an environment inside the room and an environment outside the room through the windowsill (D), said thermal insulation device comprising:

- at least one connection body (2) defining a housing (3) adapted to receive at least partially therein at least a portion of the windowsill (D) to connect said thermal insulation device to the windowsill (D);
- at least one insulating element (7) configured to provide at least a partial thermal insulation of the windowsill (D);

wherein said at least one insulating element (7) is at least partially housed in said housing (3) so as to provide at least a partial thermal insulation of the windowsill (D).

2. The device in accordance with claim 1, wherein said at least one connection body (2) has a substantially "C-shaped" cross section, said connection body (2) comprising a first wing (4), a second wing (5) and a core suitable for connecting said first wing (4) and said second wing (5); and wherein said first wing (4), said second wing (5) and said core (6) are operatively connected so as to at least partially define said housing (3).

3. The device in accordance with claim 2, wherein said at least one insulating element (7) comprises at least one lower element (8) and/or at least one upper element (9) and/or at least one head element (10) respectively configured to at least partially cover said first wing (4) and/or said second wing (5) and/or said core (6); said at least one lower element (8) and/or at least one upper element (9) and/or at least one head element (10) being at least partially housed in said housing (3).

4. The device in accordance with claim 3, wherein said at least one lower element (8) has a thickness comprised between 5 mm and 50 mm, preferably comprised between 15 mm and 40 mm, even more preferably equal to 30 mm; and/or wherein said at least one upper element (9) has a thickness comprised between 1 mm and 30 mm, preferably comprised between 5 mm and 20 mm, even more preferably equal to 10 mm; and/or wherein said at least one head element (10) has a thickness comprised between 5 mm and 35 mm, preferably comprised between 10 mm and 30 mm, even more preferably equal to 20 mm.

5. The device in accordance with one or more of claims 2-4, wherein said first wing (4) is, when in use, disposed below said second wing (5); and/or wherein said first wing (4) and said second wing (5) are, when in use, respectively facing a lower surface of the windowsill (D) and an upper surface of the windowsill (D).

6. The device in accordance with one or more of claims 2-5, wherein said connection body (2) comprises at least one lateral closing element extending substantially perpendicularly to the first wing (4), to the second wing (4) and to the core (6).

7. The device in accordance with one or more of the preceding claims, comprising at least one covering element (11) adapted to at least partially cover at least one outer surface (30) of said connection body (2) connecting to said housing (3).

8. The device in accordance with one or more of the preceding claims, comprising a plurality of connection bodies aligned or alignable along a longitudinal

direction, each connection body (2) defining a respective housing (3) adapted to receive at least partially therein at least a portion of the windowsill (D) to connect said device to the windowsill (D).

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9. The device in accordance with one or more of the preceding claims, wherein said at least one insulating element (7) is at least partially made of polystyrene and/or other similar insulating materials.

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10. The device in accordance with one or more of the preceding claims, wherein said at least one insulating element (7) at least partially covers said connecting body (2) internally.

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11. The device in accordance with one or more of the preceding claims, wherein said at least one insulating element (7) at least partially has the conformation of a panel.

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12. The device in accordance with one or more of the preceding claims, wherein said at least one insulating element (7) at least partially has a rigid and/or semi-rigid conformation.

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13. A method for thermally insulating an interior windowsill of a room, comprising the steps of:

- providing a connection body connectable to an interior windowsill of a room;
- inserting at least one insulating element in said connection body;
- connecting said connection body to the interior windowsill of a room.

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14. The method in accordance with claim 13, wherein said step of connecting said connection body to the windowsill is carried out in such a way that said at least one insulating element is disposed, when in use, facing at least one surface of the windowsill.

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15. The method in accordance with claim 13 or 14, comprising a step of providing a thermal insulation device for an interior windowsill of a room in accordance with one or more of claims 1-7; at least one of said steps being carried out with said device (1).

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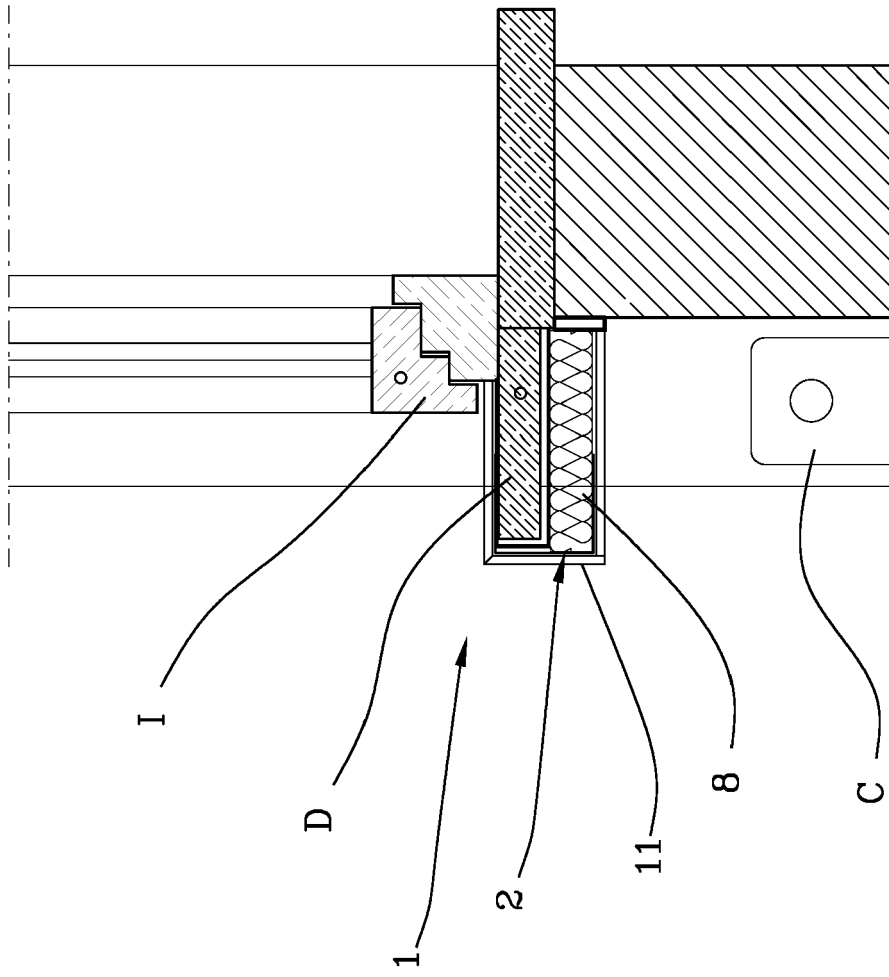


Fig. 1B

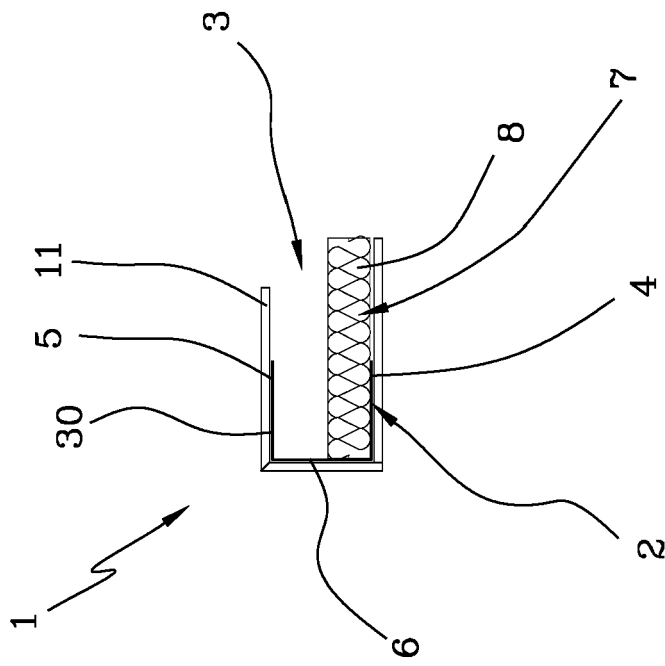


Fig. 1A

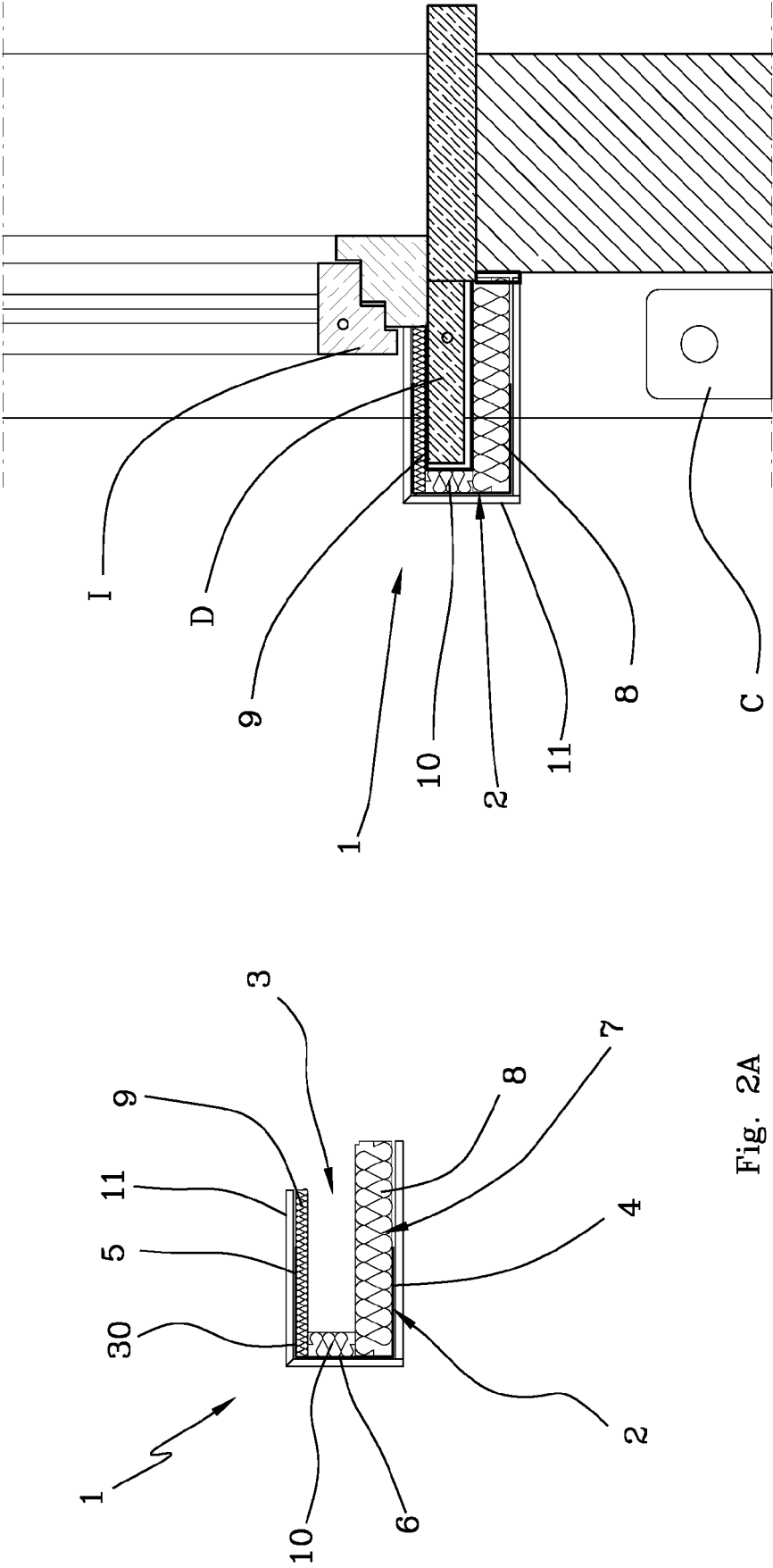


Fig. 2B

Fig. 2A

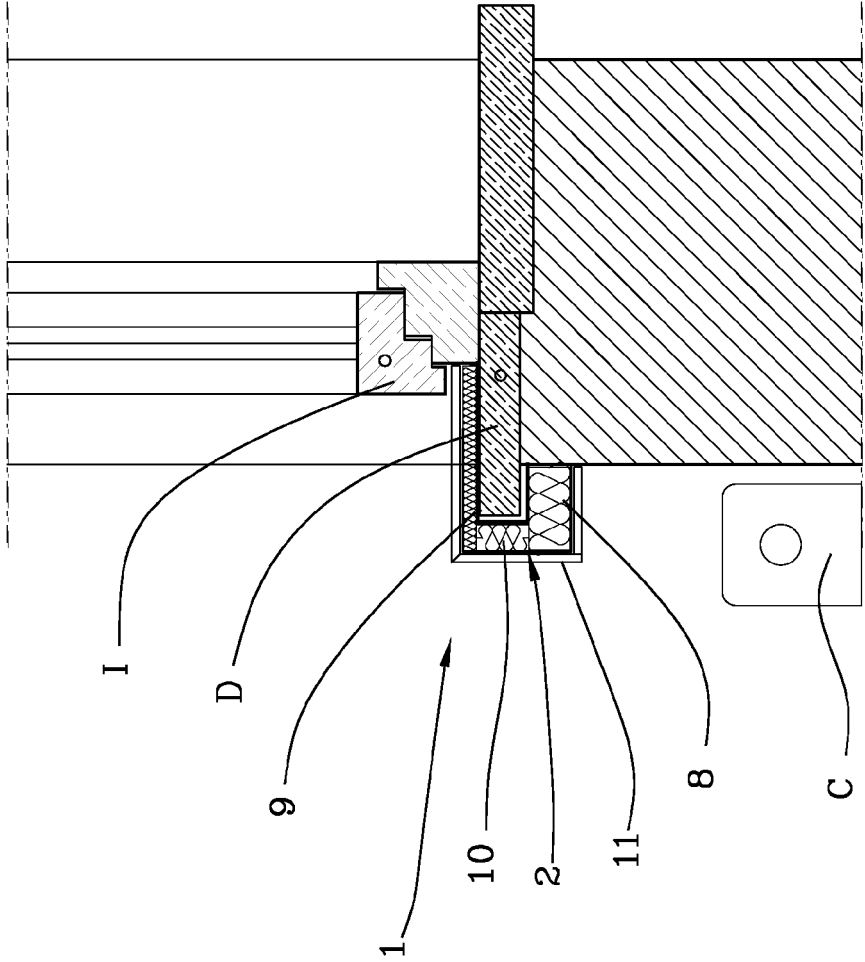


Fig. 3A

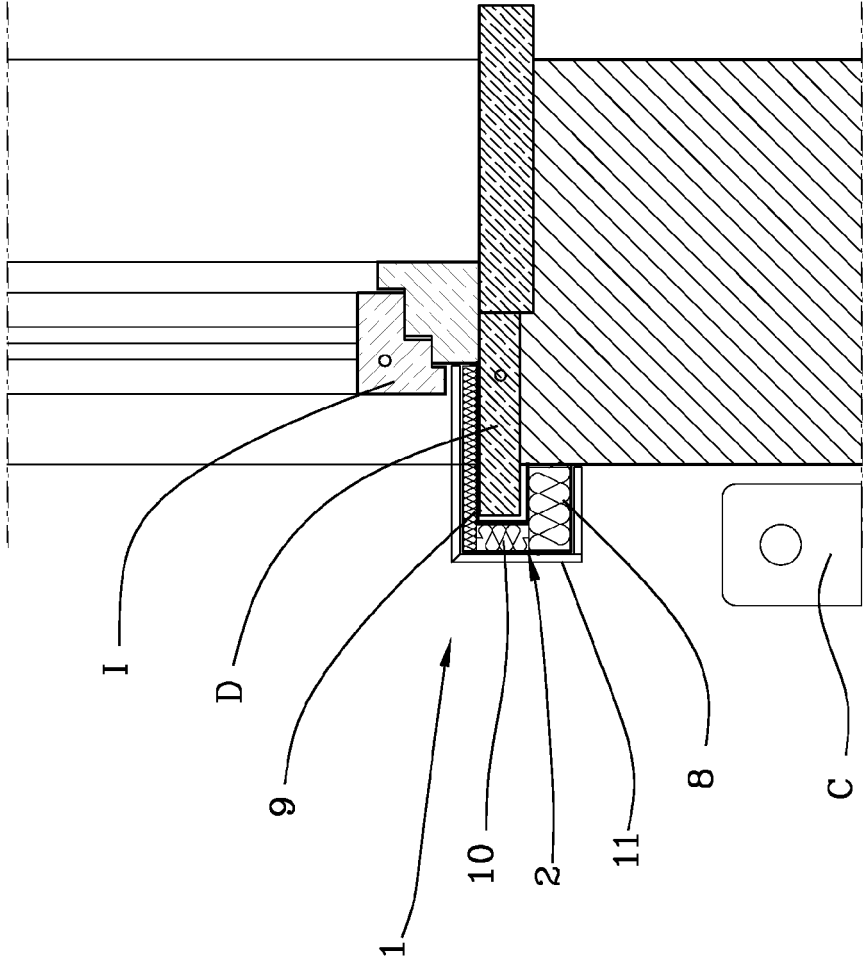


Fig. 3B



EUROPEAN SEARCH REPORT

Application Number

EP 24 18 0125

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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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			E06B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		16 September 2024	Cobusneanu, D
CATEGORY OF CITED DOCUMENTS		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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 24 18 0125

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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