



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
15.02.2017 Bulletin 2017/07

(51) Int Cl.:
E04F 13/00 (2006.01) **E04F 13/08** (2006.01)
E04F 13/16 (2006.01) **E04F 13/12** (2006.01)
E04C 2/292 (2006.01) **E04B 1/76** (2006.01)

(21) Application number: **16173293.8**

(22) Date of filing: **07.06.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
 Designated Extension States:
BA ME
 Designated Validation States:
MA MD

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(30) Priority: **12.08.2015 FI 20155582**

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(54) **MULTILAYERED RENOVATION BUILDING ELEMENT**

(57) The invention relates to a multilayered renovation building element (2) having a core part (2c) of thermal insulation material and surface panels (2a, 2b) covering it on both sides, the surface panels having a tongue (5) on one longitudinal edge and a groove (4) on the opposite longitudinal edge. In the inner surface panel of the renovation building element is formed at least one opening

(7), which is covered by a water vapour-permeable membrane material (6). In the thermal insulation material of the core part (2c) of the renovation building element (2) is formed at least one ventilation channel (9), which opens directly or via a separate connecting channel to the outside air.

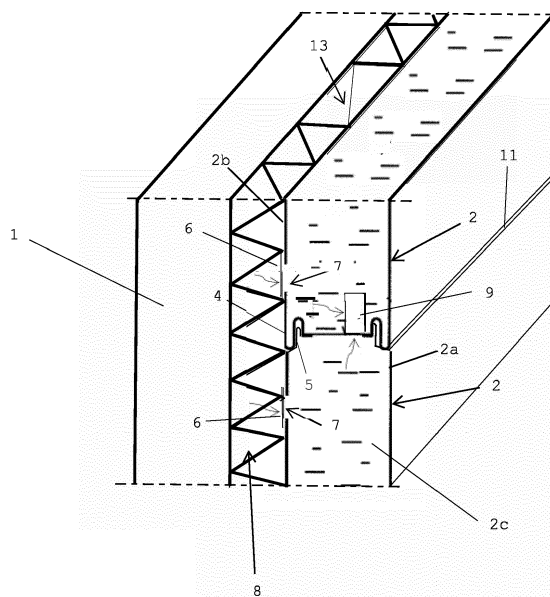


FIG. 3

Description

[0001] The invention relates to a multilayered renovation building element having a core part of thermal insulation material and surface panels covering it on both sides, the surface panels having a tongue on one longitudinal edge and a groove on the opposite edge.

[0002] In Finland, as in many other countries, there are many buildings in need of renovation. To repair these, various renovation elements have been developed, which are suspended, for example by means of fasteners, on load-bearing structures. However, these known solutions are generally compromises between thermal insulation and, on the other hand, adequate ventilation in order to avoid moisture problems.

[0003] Publication WO9522670 discloses an element having a metal outer surface and thermal insulation attached to this surface, the thermal insulation being adapted to settle directly against the substructure to be covered. This requires the use of a separate fastening strip, which extends from the metal outer surface to the substructure. Also from publication CH525359 is known a covering element having a metal outer surface and thermal insulation layer attached to this surface. Publication GB1468534 discloses an insulation solution for cold storage rooms, which has a thermal insulation layer and surface panels on both of its sides. Publication GB2306984 discloses a building element having a surface panel of plywood or the like and studs attached therein. The surface panel is perforated. Insulation material is added at the worksite between the surface panel and an opposite surface panel, which is e.g. plasterboard, to be attached at the worksite. JP2004092312 discloses an insulation panel of polystyrene or the like, having on one surface ventilation grooves and a fabric covering these grooves, on top of which is arranged a plaster layer. CA2614522 discloses an element made of polystyrene, on the surface of which is arranged a coating containing cement. The surface to be placed against the substructure is provided with ventilation grooves.

[0004] The object of the present invention is to provide a reliable renovation element for the renovation of old buildings, especially the facades of office buildings, the element enabling good thermal insulation and tightness as well as, at the same time, providing good ventilation.

[0005] To achieve this object, a renovation building element according to the invention is characterized by that in the inner surface panel is formed at least one opening, which is covered by a water vapour-permeable membrane material, and that in the insulation material of the core part of the renovation building element is formed at least one ventilation channel, which opens directly or via a separate connecting channel to the outside air.

[0006] A solution according to the invention allows the moisture in a building to escape through the water vapour-permeable membrane and further through the insulation material into the ventilation channel, which leads the moisture either directly or through the connecting

channel to the outside air, thus drying the building. When renovating exceptionally wet structures, a temporary ventilation gap can be arranged between the renovation building element and the old structure, the gap being to be closed once the structure has adequately dried in order to maintain the thermal insulation capability as high as possible.

[0007] In the following, the invention is described by referring to the accompanying drawings, in which

Fig. 1 shows a diagrammatic principle illustration of the placement of the renovation building elements in a vertical installation,

Fig. 2 shows a diagrammatic principle illustration of the placement of the renovation building elements in a horizontal installation, and

Fig. 3 shows a partial section of the horizontal installation according to Fig. 1 as an isometric view in the direction indicated by the arrows III-III.

[0008] Fig. 1 shows the placement of the renovation building elements 2 in a vertical installation. The height h of the renovation building elements 2 is typically 3-12 m and the width 1.2 m. The ventilation channel is preferably arranged at the joint 10 between the elements, the channel opening from its upper end to the outside air as protected from the rain, for example, by a protection plate (not shown). When the elements are installed vertically, there can be in the vertical direction one or more elements installed one on top of the other. If the building is, for example, 20 m high, there can be 2 units of 10 meter high elements. In this case, ventilation occurs at the top and bottom edges of each element, i.e. ventilation occurs also in the joint between the elements.

[0009] Fig. 2 shows the placement of the renovation building elements 2 in a horizontal installation. The length L of the renovation building elements 2 is typically 3-12 m and the width W 1.2 m. The ventilation channel is preferably arranged at the horizontal joint 11 between the elements, the channel opening into the connecting channel arranged in connection with the vertical joint 12 between the elements, the connecting channel opening from its upper end to the outside air as protected from the rain, for example, by a protection plate.

[0010] Fig. 3 shows an embodiment example of the renovation building element 2 in a horizontal installation. The renovation building element 2 preferably comprises a core part 2c of mineral wool, to both main surfaces of which are fastened, preferably by gluing, the surface panels 2a, 2b, which are preferably of plastic-coated sheet steel. The mineral wool layer is preferably formed from structural wool lamellae, in which the fibres are substantially perpendicular in relation to the surface panels 2a, 2b. In the horizontal bottom edge of the surface panels has been made a groove 4 and in the upper edge a tongue 5. In the embodiment shown, in the inner surface panel

has been made an opening 7, which is covered by a water vapour-permeable membrane 6 fastened to the outer surface of the inner surface panel. The membrane can be, for example, a TYVEK[®] membrane, which is preferably fastened by gluing to the outer surface of the inner surface panel. The fastening of the membrane can also be performed mechanically. There can be a plurality of openings 7 and among them can be various shapes and various sizes in surface area. The total surface area of the openings is preferably approx. 10% of the surface area of the inner surface panel, the minimum being approx. 5%. The surface area of the openings can, depending on the situation, also be larger, for example, from 15% up to 80%, provided that the strength of the inner surface panel permits this. When gluing the core part 2c to a surface panel 2b having an opening, the core part remains without the adhesive layer at the openings 7 in the surface panel, wherein moisture is allowed to move at the openings through the mineral wool relatively easily to the ventilation channel 9. In the embodiment shown, the ventilation channel 9 is arranged near the outermost surface panel 2a of the renovation building element 2 in the vicinity of the groove 4. The placement of the ventilation channel 9 to open at the joint between the renovation building elements to be placed one on top of the other makes preparation of the ventilation channel relatively easy. It can be performed, for example, by milling a groove of the desired depth and width in the edge of the core part in connection with the manufacture of the renovation building element. There can be more than one ventilation channel 9 and it can also be located elsewhere than at the site shown. In the embodiment shown, the shape of the ventilation channel is a rectangle, but its shape can also be something other, for example, semi-circular.

[0011] The renovation building element 2 is preferably fastened by means of separate fasteners (not shown) to the old load-bearing wall 1. To compensate for unevennesses of the wall 1, an insulation layer 8 of soft mineral wool can be placed between the renovation building element 2 and the wall 1. The insulation layer can be attached ready to the inner surface panel 2b of the renovation building element or it can be installed at the work-site to the wall 1 before installing the renovation building element into place. If the wall to be renovated is extremely wet, the soft wool can be left out at least partially such that between the renovation building element 2 and the wall 1 is formed one or more temporary vertical ventilation channels 13, which is/are closed from the bottom and top ends when the moisture content has adequately decreased. In this case, the thermal insulation capability improves after the initial drying, when heat is not allowed to escape from the wall 1 of the building via the temporary ventilation channel.

Claims

1. A multilayered renovation building element (2) having a core part (2c) of thermal insulation material and surface panels (2a, 2b) covering it on both sides, the surface panels having a tongue (5) on one longitudinal edge and a groove (4) on the opposite longitudinal edge, **characterized in that** in the inner surface panel of the renovation building element is formed at least one opening (7), which is covered by a water vapour-permeable membrane material (6), and that in the thermal insulation material of the core part (2c) of the renovation building element (2) is formed at least one ventilation channel (9), which opens directly or via a separate connecting channel to the outside air, the thermal insulation material allowing the movement of moisture between said at least one opening (7) and the ventilation channel (9).
2. A renovation building element (2) according to claim 1, **characterized in that** said at least one ventilation channel (9) is formed in the edge on the side of the groove (4) of the core part (2c) of the renovation building element and opens at the joint to be formed together with the edge on the side of the tongue (5) of the adjacent renovation building element (2).
3. A renovation building element (2) according to claim 1 or 2, **characterized in that** said at least one ventilation channel (9) is formed near the outermost surface panel (2a) of the renovation building element.
4. A renovation building element (2) according to any one of the preceding claims, **characterized in that** to the inner surface panel (2b) of the renovation building element (2) is fastened an insulation layer (8) of soft mineral wool.
5. A renovation building element (2) according to any one of the preceding claims, **characterized in that** the material of the surface panels (2a, 2b) is plastic-coated sheet steel.
6. A renovation building element (2) according to any one of the preceding claims, **characterized in that** the thermal insulation material of the core part (2c) is mineral wool, in which the fibres are substantially perpendicular in relation to the surface panels (2a, 2b).
7. A renovation building element (2) according to any one of the preceding claims, **characterized in that** in the inner surface panel is arranged a plurality of openings.
8. A renovation building element (2) according to any one of the preceding claims, **characterized in that** the total surface area of the one or several openings

arranged in the inner surface panel is in the range of approx. 5% - approx. 80% of the surface area of the inner surface panel.

9. A renovation building element (2) according to claim 8, **characterized in that** the total surface area of said opening or openings is approx. 10% of the surface area of the inner surface panel.

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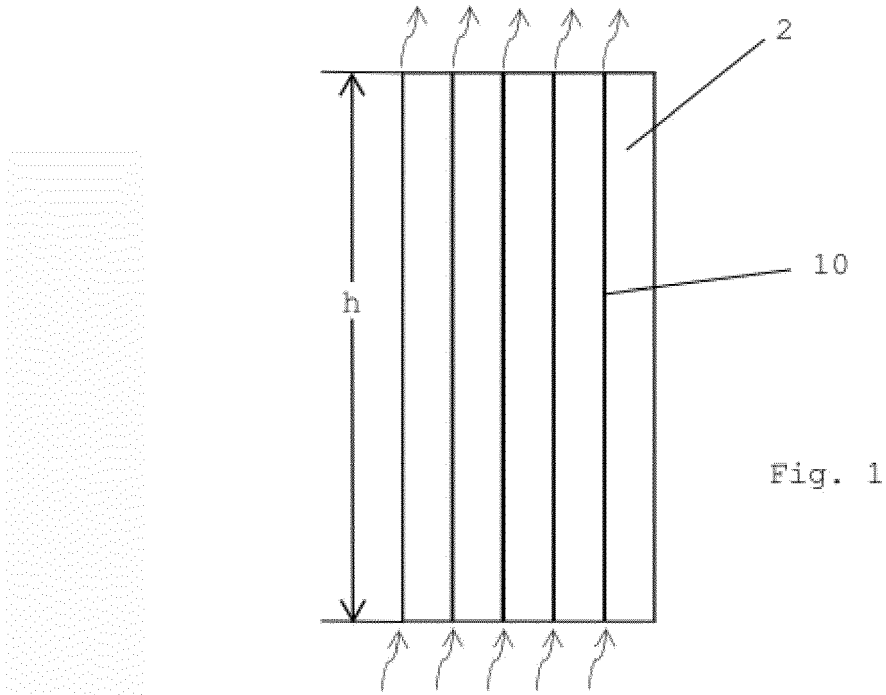


Fig. 1

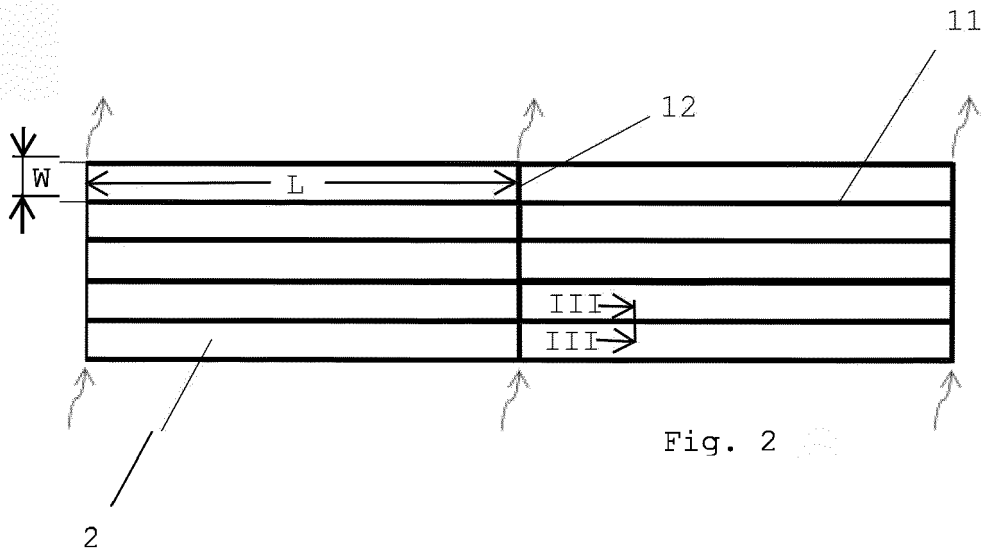


Fig. 2

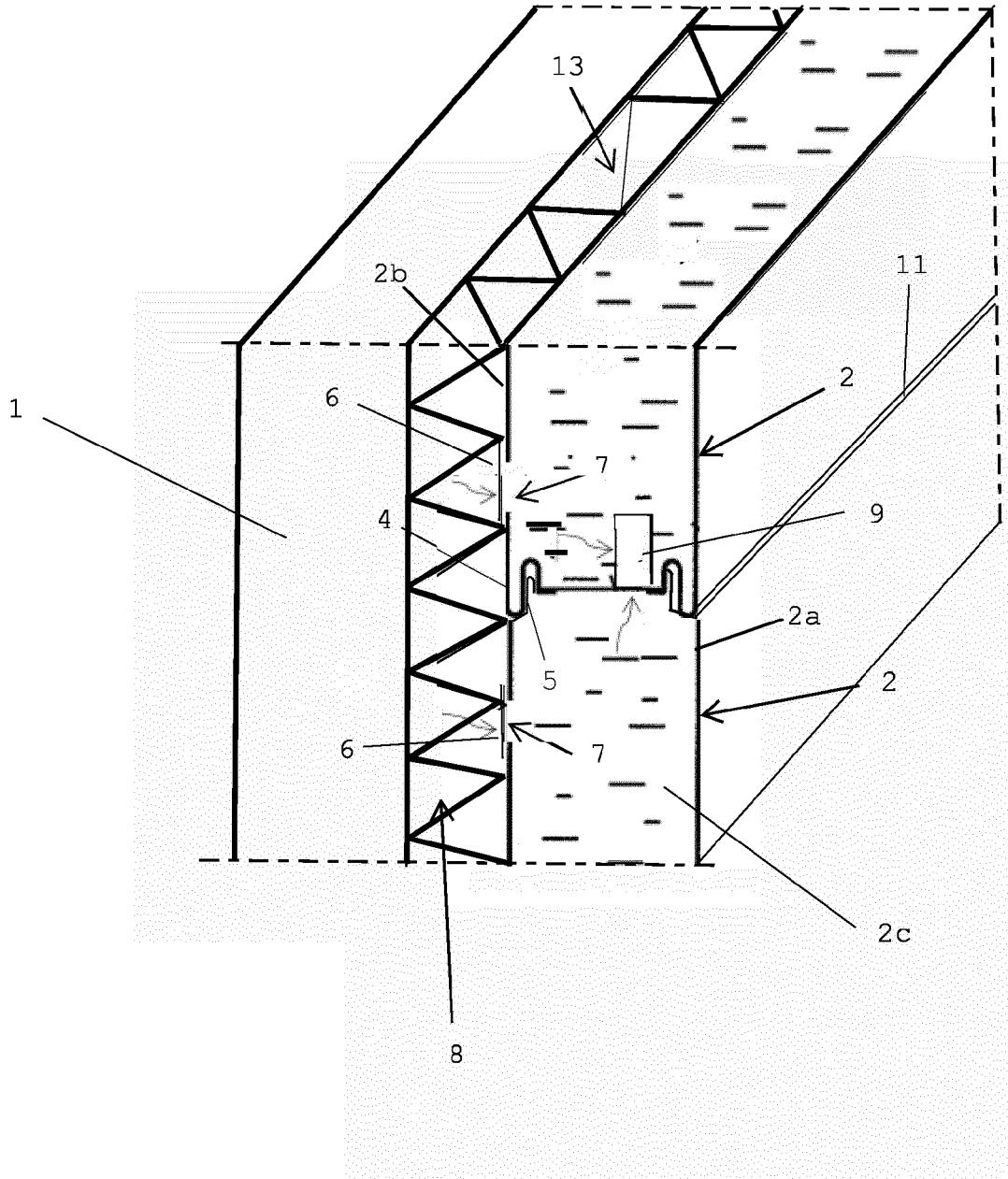


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 16 17 3293

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Y	EP 2 657 426 A2 (PAROC OY AB [FI]) 30 October 2013 (2013-10-30) * figures 1-3 * * paragraph [0001] * * paragraph [0008] * * paragraph [0012] * * paragraph [0014] * * paragraph [0016] *	1-4,6-9	
Y	CN 104 264 892 A (ZHONG WEIJIE) 7 January 2015 (2015-01-07) * figure 1 * * paragraph [0034] *	4	TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 November 2016	Examiner Estorgues, Marlène
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			

EPO FORM 1503 03.02 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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