A CONSTRUCTION SYSTEM FOR WALLS ABOVE GROUND LEVEL

Abstract: The invention relates to a construction system (101) for walls (102) situated above the ground and that comprise thermal insulation having an applied surface layer (105). According to the invention, an inner insulating panel (103), which is carried on the wall, has a thermal insulating function as well as a draining function. A surface layer in the form of render forms an external surface layer (105) outside said inner insulating panel (103).
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A CONSTRUCTION SYSTEM FOR WALLS ABOVE GROUND LEVEL

The present invention relates to a construction system for walls situated above the ground and that comprise thermal insulation having an applied surface layer.

Known construction systems of the type mentioned comprise insulation having an air gap between the insulation and the external masonry, or else the insulation is moisture resistant and does not come off through moisture, or that drainage grooves are arranged along one side surface of insulation panels. Furthermore, thermally insulating drainage panels may be present but that are not formed of cellular plastic material and that are not suitable to be used for rendering.

The main object of the present invention is therefore primarily to provide a construction system that, among other things, solves the above-mentioned disadvantages and that allows reliable and efficient construction of walls having external rendering on the wall.

Said object is achieved by a construction system according to the present invention that essentially is characterized in that an inner insulating panel, which is carried on the wall, has a thermal insulating function as well as a draining function internally in said combined thermally insulating and draining inner insulating panel, and that a surface layer in the form of render forms an external surface layer outside said inner insulating panel.
The invention is described below in the form of a couple of preferred embodiment examples, reference being made to the accompanying drawings, in which:

Figs. 1 and 1A show a first example of a construction system according to the invention, and

Figs. 2 and 2A show a second embodiment example of a construction system according to the invention.

By WO 2009/040376 Al, a wall (300) of a passive building is previously known and that comprises insulating panels (304, 306) that are separated from each other by means of a waterproof and vapour proof barrier (305).

According to the disclosure, Figs. 17-18 in said WO 2009/040376 Al and Fig. 3 therein, in that connection it is possible to omit the insulation (306, 304) on either the inside (302) or the outside (301) of this waterproof and vapour proof barrier (305). Furthermore, the outer insulation (304) and the inner insulation (306) may have a thickness of between 1 and 600 mm.

Said waterproof and vapour proof barrier (305) may consist of many different materials, for instance steel, aluminium or other metal materials, wood, plastic, glass fibre or a combination thereof, but most preferably of steel.

An essential function of a building wall is that the wall is thermally insulated to save energy in heating occasions for the building in question.

A further essential function is that the building wall has a draining function to prevent moisture from entering into the building in question.

According to said known WO 2009/040376 Al, if outer thermal insulation (304) is omitted and said wa-
terproof and vapour proof barrier (305) is allowed to consist of, e.g., wood, such a wall will not be good for the building in question if moisture enters through the outer wall to said barrier (305). Then, the wall should become as a sponge that sucks up moisture.

According to the present invention, said problems are solved by there being arranged a thermal insulation and by this insulation in addition having a draining function thanks to it being formed of a combined thermally insulating and draining inner insulating panel 3; 103.

The invention is an air barrier and a weatherproofing of facades of a second layer. As a weatherproofing of a second layer, it also protects against attacks by the elements during the construction process. By the invention as a frame protecting air barrier, the risk of condensate in the wall structure is minimized. The air barrier consists of a plurality of components that are applied continuously and unbroken to the outside of the structure and at connecting pieces and lead-throughs. The construction process should be carried out professionally in such an order that it is possible to guarantee the continuity and long-term durability of the air barrier.

The function as air barrier should not be confused with vapour barrier/vapour retarder such as, e.g., internal PE film. A vapour barrier should be located on the warm side of the wall structure. If a vapour barrier is not used, the wall structure and ventilation have to be adapted in the moisture dimensioning.

The embodiment example shown in Fig. 1 in the form of a perspective view of a wall 2 according to the invention, comprising an inner insulating panel that has a thermal insulating function as well as a draining
function internally in the same, and in Fig. 1A in the form of a cross-sectional view, differs from the wall 202 shown in Fig. 2 in the form of a perspective view and in Fig. 2A in the form of a cross-sectional view by this further shown wall 102 comprising a further carried insulating panel 106 that is situated outside the combined thermally insulating and draining inner insulating panel 103 and has a thermal insulating function.

A construction system 1; 101 according to the present invention, which is intended to be used for walls 2; 202 that are situated above the ground and that comprise thermal insulation having an applied surface layer, comprises an inner insulating panel 3; 103 in the wall 2; 202, and which is carried on the wall and preferably on the proper frame 11; 111 of the wall and has a thermal insulating function as well as a draining function, internally in said combined thermally insulating and draining inner insulating panel 3; 103. A surface layer in the form of an outer facade layer 5; 105 of render forms an external primary surface layer outside said inner insulating panel 3; 103. Outside said outer facade layer of proper scratch coat 5; 105, there is an outermost layer of finishing coat 17; 117, which is thin and essentially lends the wall 2; 202 its intended colour and/or structure.

Furthermore, the construction system 1; 101 comprises an additional insulating panel 6; 106 carried in the wall 2; 102. Said insulating panel 6; 106 is carried outside the combined insulating and draining inner insulating panel 3; 103 and that has thermally insulating function.

Said inner combined insulating and draining insulating panel 3; 103 is formed of a suitable cellu-
lar plastic material, and said insulating panel 106 situated outside the same is formed of cellular plastic material.

Fastening of the first inner combined insulating and draining insulating panel 3; 103 takes place in such a way that it is pasted to a suitable substructure 8; 108 in the form of a frame protection that can breathe. Also said second external insulating panel 106 is pasted to a substructure, preferably to said inner combined insulation and drainage panel 103 on the outside 103A thereof by, e.g., being glued thereon.

In order to reinforce the wall 2; 102, reinforcement 4; 104, e.g., glass-fibre fabric, may be laid in the scratch coat layer 5; 105 of the wall 2; 102, said outer insulating panel 106 being ground on the outer surface 106A thereof so as to be well cleaned and smooth before reinforcement and scratch coating.

Inside the first inner insulating/drainage panel 3; 103, there are attached stiffening panels 16; 116 provided with frame protection 8; 108, to which the inner insulating panel 3; 103 is attached by pasting by means of paste 9; 109 applied by a notched trowel, as the outer panel 106 is pasted by paste 110 applied by a notched trowel.

Between gaps and possible positions of faults in said insulating panels 3; 103, 106, seal foam is filled so that no hollow spaces between the same arise that can propagate heat/cold and moisture through the wall 2; 102.

Outside said outer facade layer of proper scratch coat 5; 105, there is an outermost layer of finishing coat 17; 117, which is thin and essentially lends the wall 2; 202 its intended colour and/or structure.
A thermal insulation in the interior of the proper wall is designated by the numerals 15 and 115, respectively, and in the drawings, this insulation 15; 115 is carried by the crossbars 11; 111 of the wall 2; 102 and accordingly forms the wall frame.

Further, the numerals 16 and 116, respectively, designate a substructure in the form of a board on said thermal insulation 15; 115. This board 16; 116 is suitably attached by screws 7; 107 on the crossbars 11; 111.

The nature and function should be understood from what has been described above and shown in the drawings, but the invention is naturally not limited to the embodiments described above and shown in the accompanying drawings. Modifications are feasible, particularly as for the nature of the different parts, or by using an equivalent technique, without departing from the protection area of the invention, such as it is defined in the claims.

Outer surface layers could alternatively be a suitable paint as a complement to or as a replacement for the outermost render layer.
CLAIMS

1. Construction system (1; 101) for walls (2; 102) situated above the ground and that comprises thermal insulation having an applied surface layer (5; 105), characterized in that an inner insulating panel (3; 103), which is carried on the wall, has a thermal insulating function as well as a draining function internally in said combined thermally insulating and draining inner insulating panel (3; 103), and that a surface layer (5; 105 and 17; 117, respectively) in the form of render forms an external surface layer outside said inner insulating panel (3; 103).

2. Construction system (1; 101) according to claim 1, characterized in that said inner insulating panel (3, 103) is formed of cellular plastic material.

3. Construction system (1; 101) according to any one of the preceding claims, characterized in that a further carried insulating panel (106) situated outside the combined thermally insulating and draining inner insulating panel (3; 103) has a thermally insulating function.

4. Construction system (1; 101), according to claim 3, characterized in that said thermal insulating panel (106) situated outside said inner combined insulating and draining insulating panel (103) is formed of cellular plastic material.
5. Construction system (1; 101) according to any one of the preceding claims, characterized in that the first inner insulating panel (3; 103) is pasted to a sub-structure (8; 108) and/or the frame (11; 111).

6. Construction system (1; 101) according to any one of the preceding claims, characterized in that the second outer insulating panel (106) is pasted to a sub-structure.

7. Construction system (1; 101) according to any one of the preceding claims, characterized in that the second outer insulating panel (106) is pasted directly onto the first inner combined insulation and drainage panel (103).

8. Construction system (1; 101) according to any one of the preceding claims, characterized in that reinforcement (4; 104) is laid in the scratch coat surface layer (5; 105) of the wall (2; 102), said outer insulating panel (106) being ground so as to be well cleaned and smooth before reinforcement and scratch coating.

9. Construction system (1; 101) according to claim 8, characterized in that the render reinforcement is formed of fibreglass (4; 104).

10. Construction system (1; 101) according to any one of the preceding claims, characterized in that, internally of the first inner insulating/drainage panel (3; 103), stiffening panels (16; 116) are attached.
11. Construction system (1; 101) according to any one of the preceding claims, characterized in that seal foam is filled into gaps and between positions of faults in said insulating panels (3; 103, 106).

12. Construction system (1; 101) according to any one of the preceding claims, characterized in that said inner insulating panel (3; 103) is carried on the frame (11; 111) of the wall.
INTERNATIONAL SEARCH REPORT

International application No. PCT/SE2011/050282

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E04B, E04C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Relevant to claim No.</th>
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<td>A</td>
<td>WO 2009040376 A1 (SAINT GOBAIN ISOVER ET AL), 2 April 2009 (2009-04-02); abstract; page 16, line 11 - page 18, line 3; figures 2,3</td>
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<td>A</td>
<td>DE 10007775 A1 (WKI ISOLIERTECHNIK GMBH BERLIN), 16 August 2001 (2001-08-16); abstract; column 2, line 26 - column 2, line 60; claims 1,4</td>
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<td>A</td>
<td>US 6282853 B1 (BLANEY GEOFFREY W ET AL), 4 September 2001 (2001-09-04); abstract; column 6, line 66 - column 8, line 67; figure 1</td>
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<td>US 5245809 A (HARRINGTON BRUCE E), 21 September 1993 (1993-09-21); abstract; column 1, line 54 - column 2, line 18; column 2, line 63 - column 3, line 23; figure 1</td>
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International Patent Classification (IPC)

E04C 2/288 (2006.01)
E04B 1/76 (2006.01)

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