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(54) INSULATING ELEMENTS AND WALLS

(71) We, ROCKWOOL INTERNATIONAL A/S, a Danish Company of Hovedgaden 501, 2640 Hedehusene, Denmark, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to an element for an outside insulation of an outer wall by adhering the element to the outer surface of the wall, which element consists of a covering panel connected with a layer of heat-insulating material. The element may also be used internally.

15 From German publication No. 1.932.045 an insulating facade element is known comprising a number of layers of different materials, namely a layer of hard insulating plastics foam, on the outside of which is a layer of roofing felt with a layer of paint on its outer face.

20 This known insulating element has roofing felt as an outer covering and is therefore suited only for certain types of facades having a level, smooth surface suited for painting. This limits the use of the known element to areas in which houses traditionally have this type of facade.

30 An insulating element according to the invention comprises a parallelepipedic slab of mineral wool and a facing element on one surface of the slab and the fibres of the mineral wool are interconnected at their crossing points by means of a bonding agent and are mainly orientated perpendicular to the surface of the facing element and the edge portions along at least two adjacent sides of the said surface are not covered by the facing element. A wall may then be erected by adhering the insulating elements to a support. They are adhered with the facing element outermost and with adjacent slabs abutting but with a gap between each adjacent pair of facing elements provided by uncovered edge portion or portions and

the gaps are then filled with mortar or other filler.

Thus by the invention a suitable decorative effect may be achieved by appropriate choice of the facing elements and yet neither the support nor the facing elements have to be in an exact plane since the uncovered edges are filled with mortar or other filler and obscure any differences in level.

Preferably the length and height dimensions of the facing element correspond to that of a normal brick and the gaps between all adjacent facing elements, provided by the uncovered edge portions, correspond to the width of a normal wall joint. Normally there are uncovered edge portions along all four sides of the surface of each element and normally the width of each uncovered edge portion is thus approximately half the width of the conventional gap between bricks. For instance each uncovered edge portion is typically 3 to 15 mm wide.

Preferably the thickness of each insulating element is also similar to the thickness of a conventional brick.

The insulating elements may be used in the construction of masonry which is not load carrying. Preferably the support to which they are adhered, for instance by a suitable adhesive, is a preformed solid wall, for instance of concrete.

The insulating elements may be used externally on an external wall depending partly upon the nature of the facing element. The facing element should be of a type that the gaps between facing elements can be filled with mortar or other filler. Suitable facing elements are flakes or splits, for instance made by splitting sand-lime bricks or tile bricks, or ceramic tiles. When flakes or splits of sand-lime bricks or tile bricks are used, the dimensions of the mineral wool slab corresponds to the format of the brick plus a normal joint in its height and length.

The use of mineral wool with bonded

fibres provides sufficient strength to enable horizontal rows of insulating elements to stay in position when placed on top of each other even before the adhesive, by which the elements are inter-connected with the wall, has set. The orientation of the fibres perpendicular to the plane of the wall provides sufficient strength to bond the facing elements to the wall, but also reduces the rigidity of the construction sufficiently to prevent cracks owing to changes in temperature or contraction of the wall material.

The invention is further described in the following with reference to the drawing in which:—

Fig. 1 shows a section through a wall insulated with the element according to the invention;

Fig. 2 shows the insulating element according to the invention.

In Fig. 1 the reference number 1 refers to a solid outer wall constructed from slabs of lightweight or aerated or otherwise foamed concrete. At the base 2 of the wall a support 3 is mounted made for example from wood, and having a straight and level upper surface 4. On this support a row of insulating elements are placed with tight joints between the slabs of mineral wool. On the wall a layer of a suitable adhesive or bonding agent is applied for example a bonding agent for ceramic tiles. Each insulating element consists of a parallelepipedic slab of mineral wool with fibres bonded at their intersections to which a facing element 6 is connected. The facing element for example may be a so-called split brick, i.e. a brick split along one of the long side faces and the fractured surface of which is suited for being the part of the facade. On the first row of insulating elements successive rows are laid until the whole wall is covered. Afterwards the joints between the covering panels are filled with a filler in order to make the facade impermeable to rain. The support 3 may afterwards be removed and replaced with a suitable insulation of the base. This insulation of the base may be made first and may be used as a support for laying up the rows of insulating elements.

In Fig. 2 an insulating element according to the invention is shown. The insulating element consists of a parallelepipedic slab of mineral wool of the type having the fibres bonded together at their intersections by means of a bonding agent, which normally is

phenolic resin. The fibres are oriented perpendicular to the facing element and to the plane of the wall on which the insulating element is to be mounted. The insulating element, therefore, has a low compressibility in the direction perpendicular to the wall. On the slab of mineral wool a facing element 6 is glued. The illustrated facing element is a split brick. Mineral wool having a specific weight of 60 kg/m³ will have a sufficient form stability to be able to carry a facade covering consisting of split bricks.

The invention is described in connection with outer walls, but is also suitable for setting up insulating, water-impermeable coverings inside houses, in which case the ability to absorb settling from the contraction of concrete walls behind the covering is the main purpose of the insulation.

WHAT WE CLAIM IS:—

1. An insulating element comprising a parallelepipedic slab of mineral wool and a facing element on a surface of the slab, and in which the fibres of the mineral wool are interconnected at their crossing points by means of a bonding agent and are mainly orientated perpendicular to the surface of the facing element and in which edge portions along at least two adjacent sides of the said surface of the slab are not covered by the facing element.

2. An element according to claim 1 in which the said surface has substantially the dimensions of a brick.

3. An element according to claim 1 to claim 2 having substantially the thickness of a brick.

4. An element according to any preceding claim in which the edge portions are 3 to 15 mm wide.

5. An element according to any preceding claim in which edge portions along all four sides of the said surface of the slab are not covered by the facing element.

6. An element according to claim 1 substantially as herein described with reference to Figure 2 of the accompanying drawings.

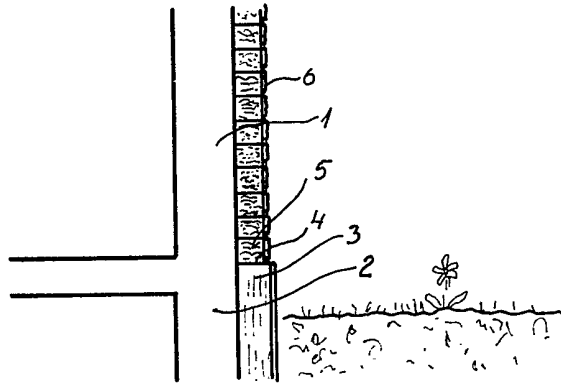
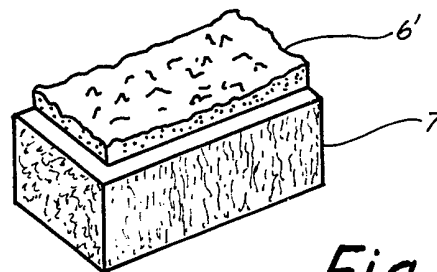
7. A wall comprising a support on which are adhered elements according to any preceding claim with the facing elements outermost, and in which adjacent slabs abut and there is a gap between each adjacent pair of facing elements provided by uncovered edge portion or portions and the

said gaps are filled with mortar or other filler.

8. A wall according to claim 7
substantially as herein described with
5 reference to Figure 1 of the accompanying
drawings.

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*Fig. 1**Fig. 2*