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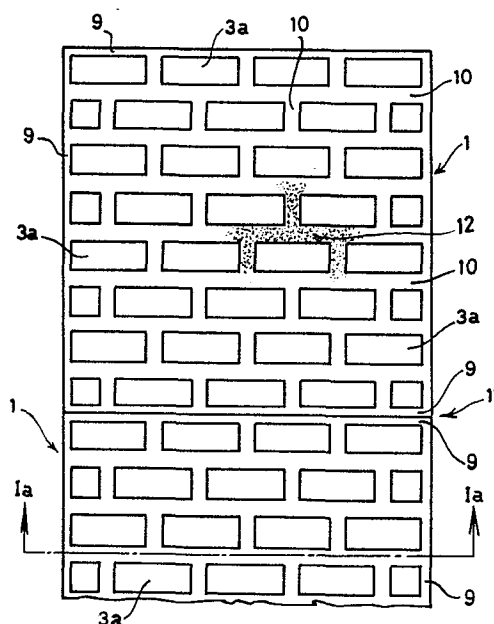
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⑤④ An insulating sheet having a cellular structure.

⑤⑦ A sheet 1 of foam plastic provided with rectangular or square weighting strips 3a of brick or ceramic material affixed to the sheet 1 by means of an elastic mortar 2. the edge sides of the sheet 1 are free from weighting material, the width of said edge sides 9 is half of the width of a joint 12 between successive strips 3a. The sheet 1 may also be provided with a dense surface of heavy aggregate particles 4 bearing upon the surface 9a of the sheet 1 and partially projecting from a layer of elastic mortar 2 affixing the particles to said sheet.



An insulating sheet having a cellular structure

This invention relates to an insulating sheet having a cellular structure, more particularly an insulating sheet of foam plastic material, suitable for use as a wall covering or for covering a reverse roof.

Insulating sheets of foam plastic are widely used as a wall covering in order to improve the insulation of houses and edifices. However, these sheets are easily damaged and and thus these sheets have to be protected by applying additional materials, which involves high costs and is very labourious.

On the other hand these insulating sheets are used on a large scale for a reverse roof covering. A reverse roof covering consists of a roof provided with a water proof layer such as a plastic foil layer or a bitumen layer, upon which one or more insulating sheets of foam plastic material having a closed cellular structure are provided.

Said known roof insulating sheet which is not being fixed to the subjacent foil layer or bitumen layer, has a relatively low weight and has therefore to be provided with a weighted layer, in the form of gravel.

5 Said gravel having a thickness of 5 cm which corresponds to 80 kg of gravel per m^2 , both provides a protection against UV-radiation acting upon the insulating sheet, and against a blowing away of the relatively light insulating sheets.

10 A gravel layer of this type has various different disadvantages.

Firstly, the evenness of the gravel layer may be hampered as soon as anybody walks upon a similar roof, resulting in areas having uneven thicknesses,

15 while additionally loose gravel tends to easily move, its free fall from a roof causing damages to vehicles, or injuries to persons.

The weight of gravel layers of this type is an additional disadvantage. Although the use of a similar

20 layer is permitted when supporting a concrete roof, such a weight is cumbersome or even inadmissible when employing the same for steel roofs or wooden roofs. In renovation areas, where especially wooden roofs have to be insulated, it is mostly not permitted to use a

25 similar gravel layer with a thickness of approximately 5 cm.

Steel constructions using insulations of this type, one is even obliged to employ heavy steel constructional parts, involving extremely high expenditures

Joints of various insulating sheets upon a roof will cause the inconvenience that the desired thickness of the gravel layer will be impeded.

5 It should finally be noted that the application of loose gravel is labourious, and so extremely expensive.

10 The present invention aims to provide an insulating sheet of the aforementioned type and consisting of material having a cellular structure which does not present the abovementioned disadvantages.

This object is achieved according to the invention in that the sheet is provided with a weighting layer of weighting material affixed thereto and providing an additional weight of at least 5 kg/cm^2 .

15 Such an amount of weighting material provides on the one hand a sufficient protection of the insulating sheet of cellular material and on the other hand a sufficient weight when such sheets are used as a roof covering.

20 In a preferred embodiment the weighting layer consists of weighting elements of stone, brick or ceramic material, such as stone or brick strips or ceramic tiles, and edge strips at at least one side of the sheet being free from weighting materials. The
25 weighting elements are preferably rectangular or square.

When sheets of this type are positioned with their
edges against each other, the space formed by the
edge strips and opposite weighting elements on two
successive strips can be filled with mortar later
on, thus providing an excellent protection of the
sheets. In the case of stone or brick strips upon
the sheets a plurality of sheets will have the
appearance of a normal brick wall with joints filled
with mortar.

Preferably the width of said edge strip being free
from weighting material is about half of the width
of a joint between rectangular weighting elements,
such as stone or brick strips or of ceramic material,
preferably of a rectangular or square shape.

The weighting layer is preferably affixed to the
sheet by means of adhesive in the form of an elastic
mortar, said mortar advantageously being used for
filling joints between successive rectangular or
square weighting elements, if present. Elastic
mortars are able to adapt themselves to small changes
of the sheet material.

For roof coverings the weighting layer of weighting
material provides an additional weight of at least
 10 kg/m^2 and more preferably of at least 20 kg/m^2 .

Said weighting layer of weighting materials having
a thickness of only approximately 10 mm, provides
the said additional weight of the insulating sheet
to be installed upon a roof, thus eliminating any
subsequent provisions such as those of providing a

gravel layer.

5 The weighting layer of weighting materials preferably comprises aggregate particles projecting at least partially from a layer of adhesive material preferably an elastic mortar layer.

10 An insulating sheet of this type presents the advantage that as soon as the weighting layer of weighting materials has been provided, the sheets can be stacked upon each other, as the presence of the projecting aggregate particles prevents a contact of the lower side of an insulating sheet with an as yet unhardened layer of elastic mortar of a subjacent insulating sheet.

15 The presence of one single layer of particles partially projecting from the elastic mortar layer causes the insulating sheet to obtain the appearance of washed-gravel tiles, whilst, moreover, it suffices to use very thin elastic mortar layers having a thickness of 5 mm and even 4 mm, so saving considerable expenditures.

20

Causing the gravel particles projecting from the mortar layer to form a substantially dense surface, will additionally provide an optimum protection against U.V.-radiation of the foam plastic material of the insulating sheet.

25

Instead of or in addition to aggregate particles partially projecting from the adhesive layer of elastic mortar, said elastic mortar layer may either

or not, also comprise weighted ballast material and, more particularly ballast material with a high density, such as steel slag particles, iron ore particles, baryte and the like. Even in case
5 that a layer of weighting material of this type has a slight thickness, in the latter manner the desired weighting layer is obtained.

The abovementioned insulating sheets have no longer to be provided with loose gravel, while no problems
10 occur in any joints and the insulating sheets are very suitable for renovation purposes, more particularly for the insulation of wooden roofs, while the insulating sheets according to the invention can also be used for steel roofs of a
15 more lower-weight construction.

The present invention will be illustrated with respect to an embodiment in the drawing, wherein:

- Fig. 1 shows an upper view of two insulating sheets and brick strips affixed to avoid
15 sheets;

- Fig. 1a is a cross section according to line Ia-Ia

- Fig. 2 is a sectional view of an other insulating sheet for a roof covering according to
20 the invention;

- Fig. 3 is a modified embodiment of the insulating sheet of fig. 3; and

- Fig. 4 is an insulating sheet according to fig. 3 and installed upon a roof.

Fig. 1 shows two sheets of foam plastic having closed cells and brick strips 3a affixed to the sheets 1 by means of an elastic mortar layer 2, which acts as an adhesive layer. The strips 3a act as weighting elements and provide an additional weight of 7 kg/m^2 .

Joints between successive rectangular brick strips 3a are filled with an elastic mortar 12.

The edge strips 9 of the sheets 1 are free from brick strips 3a, their width being half the width of the joint between two brick strips.

A space 11 bounded by the edge strips 9 of two successive sheets 1, is preferably filled with an elastic mortar.

Fig. 2 is another embodiment of an insulating plate 1, of foam plastic material and provided with an elastic mortar layer 2, formed from sand, mortar, water, and a latex and having a total thickness of 10 mm, so providing an additional weight of 20 kg/m^2 .

If the elastic mortar layer comprises weighted steel slag particles 3, the thickness of said layer can be reduced to, for instance, 5 mm.

The elastic mortar layer provides a sufficiently weighted effect, thus precluding an insulating sheet loosely installed upon a roof, from being blown away.

Fig. 3 shows an other embodiment, consisting of an insulating foam plastic sheet 1, provided with a latex cement mortar layer 2, gravel particles 4 being embedded and affixed to said mortar layer.

5 The gravel particles 4 project at least partially from the surface on the latex mortar layer and form a substantially dense surface 5, thus preventing, even in case of little tears, occurring in the latex mortar layer, ultraviolet rays to degrade the foam

10 plastic material of the sheet. On the other hand, the gravel particles bear upon the surface 9a of the insulating sheet 1.

The total thickness of the latex mortar layer of 4 mm amounts, together with the gravel particles, to

15 approximately 10 mm, and provides an additional weight comprised between 20 kg/m^2 to 25 kg/m^2 .

Fig. 4 illustrates that the sheet 1 of fig. 3 provided with the latex mortar layer comprising embedded and attached gravel particles, is

20 installed upon a foil layer 6, being adhered to a concrete roof 8, by means of an adhesive layer 7. Obviously, use can also be made of a self-adhesive foil layer.

It will be apparent that said concrete roof 8 may

25 also consist of wood or steel.

The use of an insulating sheet according to fig. 3 additionally offers the advantage that small roof parts remaining uncovered after having covered said

roof, may as yet be provided with portions of an insulating sheet 1, being provided in situ with a mortar layer 2, said mortar layer additionally being sprinkled with gravel particles.

- 5 It is observed that the reference numerals in the claims are not intended to restrict the scope thereof, but are only denoted for clarification.

Claims:

1. An insulating sheet having a cellular structure, characterized in that the sheet⁽¹⁾ is provided with a weighting layer of weighting material affixed thereto and providing an additional weight of at least 5 kg/m².
5
2. An insulating sheet according to claim 1, characterized in that, the weighting layer consists of weighting elements^(3a) and at least one edge side⁽¹⁹⁾ of the sheet being free from weighting materials.
10
3. An insulating sheet according to claim 1 of 2, characterized in that, the weighting elements (3a) are of a rectangular or square form and preferably consist of stone, brick or ceramic material.
15
4. An insulating sheet according to claims 2 or 3, characterized in that the edge side⁽¹⁹⁾ presents a width corresponding substantially with half of the width of a joint⁽¹²⁾ between two successive weighting elements.
20
5. An insulating sheet according to claim 1, characterized in that the weighting layer consists of weighted ballast material⁽³⁾ preferably heavy aggregate materials, affixed to the sheet by means of an adhesive layer.
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6. An insulating sheet according to claims 1 to 5, characterized in that, the weighting material

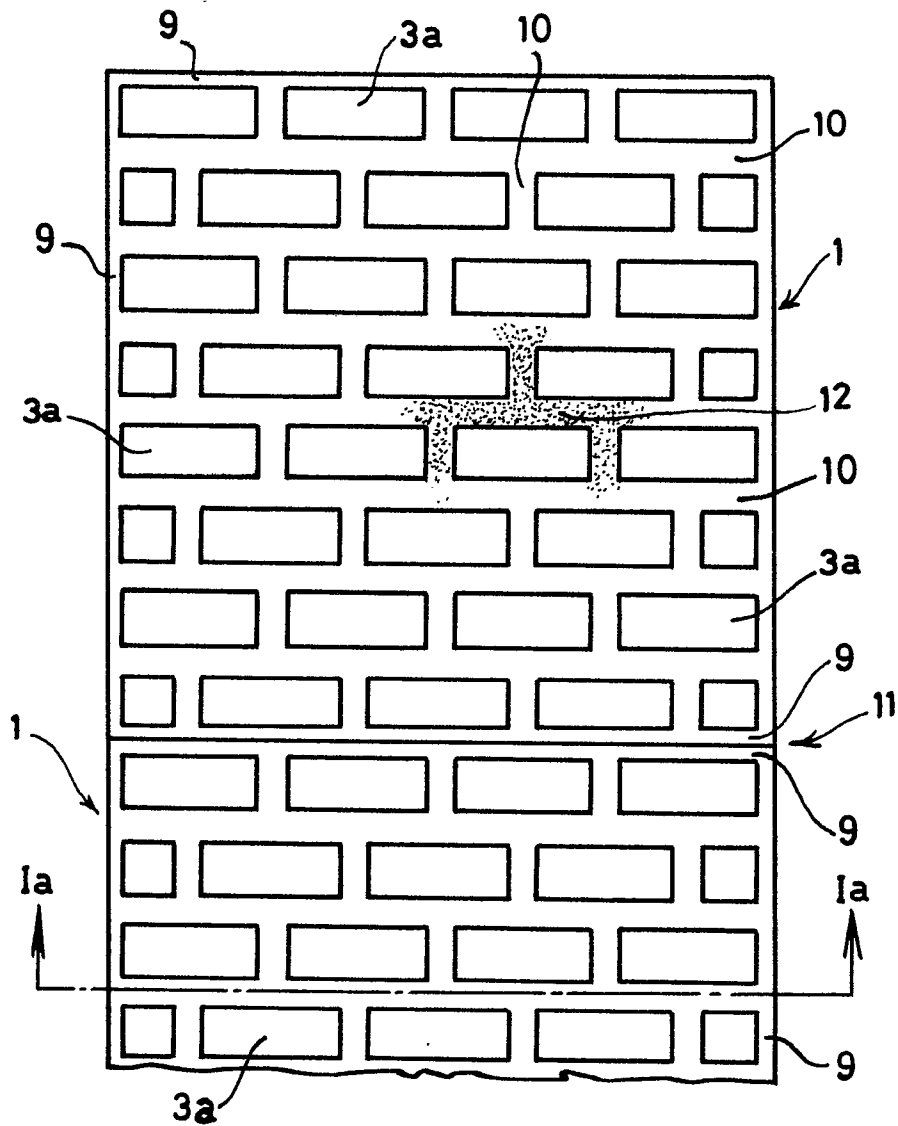
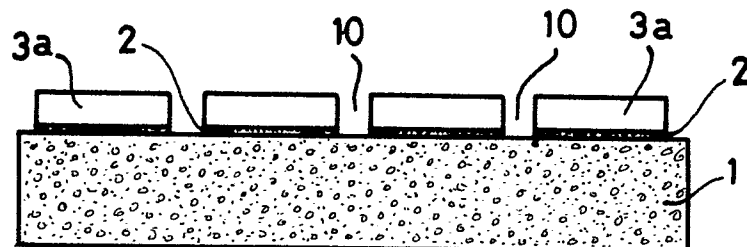
or weighting elements are affixed to the sheet
by means of an elastic mortar (2).

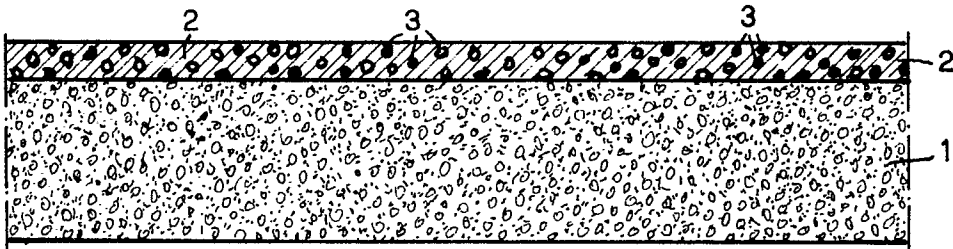
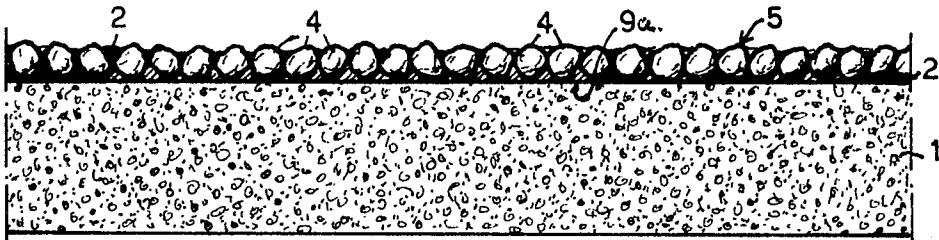
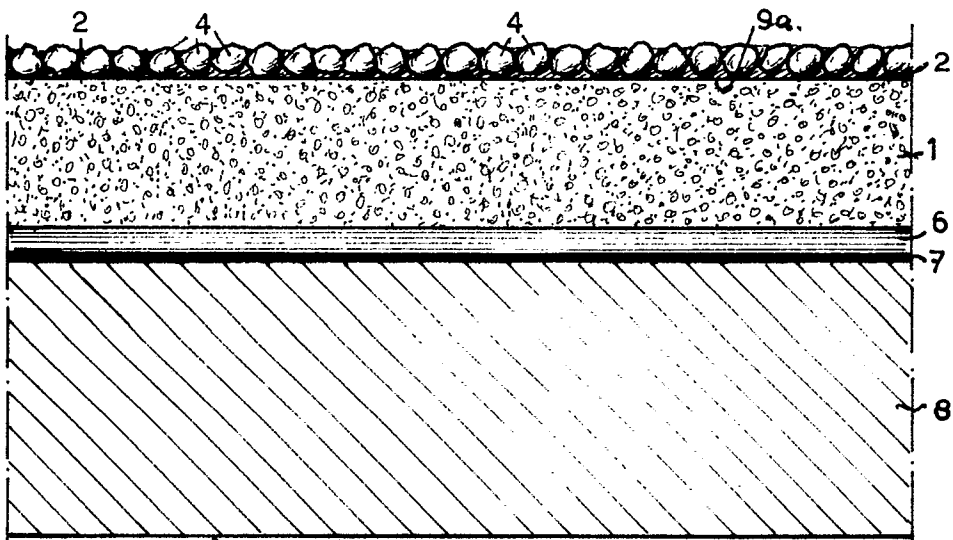
5 7. An insulating sheet as claimed in claim
5 or 6, characterized in that the weighted ballast
material is entirely enclosed in the adhesive layer.

10 8. An insulating sheet as claimed in any or
more of the claims 5 or 6, characterized in that, the
layer consists of aggregate particles,⁽⁴⁾ projecting
at least partially from the adhesive layer, said
aggregate particles preferably forming a dense surface.

9. An insulating sheet as claimed in claim
5-8, characterized in that, said weighted ballast
material provides an additional weight of at least
10 kg/m².

15 10. An insulating sheet as claimed in
claims 5 to 9, characterized in that, the aggregate
particles ⁽⁴⁾ bear upon the sheet surface being in contact
with the adhesive layer.

**FIG. 1.****FIG. 1a.**

**FIG: 2.****FIG: 3.****FIG: 4.**