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(54) **A multilayer roofing element and a method for manufacturing the same**

Mehrschichtiges Dachelement und Herstellungsverfahren dafür

Élément de toiture multicouche et son procédé de fabrication

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Description

[0001] The present invention relates to a multilayer roofing element according to the introduction of claim 1.

[0002] Such a roofing element is generally known in the form of a course of bitumen provided with a combustible foil on the back side. The primary purpose of the combustible foil is to prevent abutting layers of a roll of bitumen from sticking together. To install the courses of bitumen on a roof, slabs of bitumen are first fixed to the roof, using fixing elements. Then courses of roofing material are laid in partially overlapping relationship on the roof and the slabs of bitumen that are fixed thereto. Once (part of) the roof has been covered in this way, the roofing elements are heated by means of a burner. As a result, the bitumen on the underside of the course will melt, causing the roofing elements to bond to the slabs of bitumen that are fixed to the roof and causing the overlapping portions of two adjoining courses to bond together. The combustible foil will burn during said heating, so that the overlapping portions of bitumen (courses and slabs) are no longer separated by the foil and said portions can bond together.

[0003] A drawback of these roofing elements is the fact that they need to be heated not only at the location of their overlapping portions but also at the locations of the slabs that are fixed to the roof in order to provide an adequate bond. Since the locations of the slabs are difficult to distinguish, if at all, the course of bitumen needs to be heated over their entire width and length. Moreover, the slabs are covered by the roofing elements after heating of the elements, so that it is difficult to distinguish the locations of these slabs and to check whetherthe roofing elements have actually bonded thereto.

[0004] French patent application FR 2800766 A1 discloses a course of waterproof material comprising an upper layer of bituminous material and affixing layer suitable for engagement with the hook side of a Velcro element. Two adjacent courses are attached to each other and to the roof by means of a small strip having an upper layer of Velcro for cooperation with the back layer of the courses and comprising an adhesive backing for attachment to a roof. Further a traditional joint covers the upper side of neighbouring roofing elements and the joint there between. A disadvantage of this known roofing element is that it requires two additional waterproof layers to ensure a leakage free roofing.

[0005] International patent application WO 98/36139 A1, discloses a shingle as a roofing element formed from an underlying flexible substrate material which bears a coating of asphalt of each major surface thereof. The asphalt coatings in turn each bear a particular of sand layer embedded thereon. On the upper surface of the shingle isfixed a longitudinally extending strip of exposed seal down asphalt. At the lower surface is fixed a small part (5 cm x 5 cm) of the hook side of a hook and loop faster for cooperation with non woven material provided on a roof.

[0006] DE 197 52 819 A1 discloses a heat insulation element having an insulation layer, on the upper surface of which a woven layer provided with hooks is attached by sewing. The hooks cooperate with a non woven layer of a cover element.

[0007] Accordingly it is an object of the present invention to provide a roofing element according to the introductory paragraph by which the disadvantages of the known roofing elements are at least partially eliminated and wherein it is not necessary to heat the course of bitumen over the entire area thereof or to distinguish locations where the roofing elements must be exposed to heat so as to bond slabs of bitumen that have been fixed to the roof and a roofing element together, or wherein the roofing elements can be fixed to the roof in a less labourious manner. This object is achieved by the roofing element according to claim 1. By fixing such a Velcro elements to the roof instead of slabs of bitumen for cooperation with the back side of a roofing element, it is no longer necessary to heat the bitumen at locations where the courses of bitumen cover the Velcro elements. After all, the Velcro elements and their backside of the bitumen adhere together directly after making contact with each other. Consequently it is no longer necessary to distinguish the locations in question. On the contrary, the bond between the courses of bitumen and the Velcro elements fixed to the roof is effected automatically upon placement of the courses of bitumen. The Velcro elements are provided with a protective layer upon being fixed to the roof, which layer is removed after a course has been positioned, so that the hook side and the loop side of the Velcro elements can only be made to adhere to each other atthat point in time. The adhesion of the fixing layer, once effected, is sufficiently strong from the outset. An inherent characteristic of Velcro connections is that the bond only becomes stronger as time passes by, because an increasing number of fibres and barbs of the two Velcro elements will engage one another. Another advantage is that the tensile strength and thus the adhesion can be predetermined by selecting a particular specification of a Velcro element (the numberof hooks percm^2).

[0008] The hook side is relatively expensive in comparison with the material of the loop side that is to be engaged by the hook side of a Velcro element. In this way the comparatively expensive hook side is locally fixed to a roof, and the comparatively inexpensive "loop side" is provided on the entire back side, or at least on a large part of the back side, of the roofing element.

[0009] The strip of at least 1 centimetre that is thus kept free from the material of the fixing layer on the back side of the bitumen can be used for overlapping an adjacent course of bitumen. When the strip of bitumen at the circumferential edge that is free from the fixing material has a width of at least 3 centimetres, preferably 5 centimetres and even more preferably 7 centimetres, a better overlap and thus a better adhesion between two adjacent courses can be realised. After all, the greater the overlap, the larger the area of adhesion between the

two layers. Since no material of the fixing layer is present, the strip can be easily fused to the portion of the adjacent course that is overlapped by the strip in the conventional manner by means of a burner, but it is also possible to fuse the strip and the portion overlapped by the strip together by means of hot air or induction.

[0010] The fixing layer preferably comprises a nonwoven fibre material. Nonwoven fibre material is very suitable for use as the loop side for engagement with the hook side of a Velcro element, and in addition it can be provided on the back side of a course of bitumen in a simple and inexpensive manner.

[0011] The fixing layer preferably comprises polypropylene and/or polyester. These materials are comparatively inexpensive and have the required characteristics for functioning as the loop side for engagement with the hook side of a Velcro element, so that a proper adhesion between the hook side and the fixing layer is realised.

[0012] In a preferred embodiment of the present invention, the fixing layer extends to a distance of at least 1 cm from the long side of the circumferential edge of the coating. In this way the long side can be used for overlapping the bitumen of an adjacent roofing element along the length thereof. Also in this case a better adhesion between two adjacent courses can be obtained if the strip that is free from the fixing material has a width of at least 3 centimetres, preferably 5 centimetres and even more preferably 7 centimetres.

[0013] Preferably, the fixing layer extends to a distance of at least 1 centimetre from at least substantially the entire circumferential edge of the roofing element. To obtain an even better adhesion, a strip width of 3 centimetres preferably 5 centimetres and more preferably even 7 centimetres may be kept free from the fixing material. As a result, all the edges of the roofing element are suitable for overlapping adjacent roofing elements and subsequently fusing the overlapping portions together, and unrolling a roll of roofing material is easy because there is no need to take into account the side of the roll on which the strip of bitumen that is free from fixing material is present for overlapping a previously laid course.

[0014] In a preferred embodiment of the presentinvention, an intermediate layer is provided between the coating and the fixing layer. Said intermediate layer is a layer which is provided on one side of a (conventional) course of bitumen so as to prevent the upper side and the underside of the course from undesirably sticking together during storage, for example during storage in the form of a roll. Preferably, the original layer behaves as a bonding layer between the bitumen and the nonwoven fibre material.

[0015] To obtain an adequate bond between the bitumen and the fixing material of the fixing layer, the intermediate layer preferably comprises a foil that is provided with perforations. By heating the bitumen on which such an intermediate layer is provided to bond the two layers together, bitumen can penetrate through the perforations of the relatively thin foil, thereby enabling the fixing layer to bond directly to the bitumen.

[0016] The intermediate layer preferably comprises polyethylene. Polyethylene foil has proven its worth as a carrier for a bituminous roofing element in practice and, in addition, it can be readily bonded to the material, for example polypropylene in or polyester, of which the fixing material of the fixing layer is composed.

[0017] In a preferred embodiment of the invention, the bituminous coating has a thickness of less than 3.8 mm, preferably less than 3.5 mm. Traditional roofing elements that are installed on a roof in a manner as known so far have a thickness of at least about 4.0 mm in order to provide a sufficiently watertight and strong bond. In the case of roofing elements according to the present invention, a thickness of as little as 3.0 mm will suffice, which makes it possible to realise a significant saving in costs. This is possible because the roofing element need not be locally heated, so that there is no risk of the bitumen locally becoming thinner due to melting. In addition to the saving in material costs this also provides a saving in storage and transport costs. Furthermore, a saving in installation costs can be realised, because a greater roll length, which is bound to a maximum weight in accordance with safety, health and welfare legislation, may now be used, thus making it possible to work more efficiently.

[0018] In a preferred embodiment of the present invention, identification means are provided, preferably in the form of a chip, for identifying the roofing element in question. Identification of roofing elements is advantageous in order to be able to trace roofing elements from a specific production cycle, for example in the case of complaints. Furthermore this makes it possible to prove that roofing elements, whether or not installed on a roof, form part of a stolen batch.

[0019] It is preferable in that connection if the identification means comprise a transmitter for reading of the identification from a remote location. This makes it readily possible to trace stolen roofing elements from a remote location.

[0020] According to a second aspect thereof, the present invention further relates to a method for manufacturing a multilayer roofing element as described above, comprising the steps of applying a course of a bituminous layer to a layer of a nonwoven material, wherein a strip of bitumen of at least 1 centimetre, seen from the edge of the course, is kept free from nonwoven material on at least one side of the course, and bonding togetherthe bitumen and the nonwoven material. Another factor that applies with regard to this second aspect is that the strip has a width of 3 centimetres, preferably 5 centimetres and even more preferably 7 centimetres so as to realise a proper bond between two adjacent courses of bitumen.

[0021] A method for manufacturing a multilayer roofing element in the form of a course of bitumen to which a layer of a material otherthan bitumen is applied by laying out a course of a bituminous layer and applying the layer of a material otherthan bitumen thereto is known. Usually

a course of a multilayer roofing element is produced in a more or less continuous process by rolling, but the method as described in the preceding paragraph has this advantage that it makes it possible to provide a nonwoven material in a precise and desired manner. In the known continuous process a strip might be kept free on a long side of the bitumen, because the course is passed through a machine in a direction parallel to the long side. Auxiliary means will be necessary in that case for determining the position of the course and preventing the nonwoven material from being damaged by the machine. With the known method it is virtually impossible to keep a strip that extends in the cross direction of the course free from nonwoven material, however, and even in those cases in which this is possible, this would at least require major modifications of the machine and might result in a reduced production capacity.

[0022] By using the method according to the present invention it becomes possible to keep specific parts of a roofing element three from the material other than bitumen. Thus it is possible when using such a method to apply a nonwoven material to the backside of the course, keeping a strip of bitumen of at least 1 centimetre, seen from the edge of the course, free from the nonwoven material, and to bond the bitumen and the nonwoven material together. Said selective application to the bitumen of a material other than bitumen may be advantageous upon further processing of the roofing elements, for example installation of the roofing elements on a roof.

[0023] It is preferable if an at least substantially rectangular course of bitumen is laid out on the surface to be covered. A rectangular course thus formed can be readily processed as a roofing element.

[0024] It is preferable in that connection if a strip of bitumen of at least 1 centimetre, seen from the circumferential edge of the course, is kept free from nonwoven fibre material when carrying out the step of applying a nonwoven material to the back side of the bituminous layer. In this way acourse is produced which has an edge that is free from nonwoven fibre material along the entire circumference thereof, and which is thus suitable for overlapping and bonding to an adjacent course when the roofing element is installed on a roof as discussed in the foregoing in relation to the roofing element.

[0025] Alternatively, a fixing layer is applied to the side of the nonwoven fibre material that is to be applied to the bituminous layer prior to the step of applying a nonwoven fibre material to the bituminous layer, or a nonwoven fibre material is applied to the fixing layer prior to the step of applying the nonwoven fibre material to the bituminous layer. In this way the bituminous layer on the one hand and the bonding layer with the fibre material present thereon on the other hand are separately produced, after which the separately produced layers can be bonded together. It may be advantageous for production reasons to produce the two layers separately, for example in order to prevent fibre material from finding its way between the bitumen and the fixing layer. Another advantage is that it is possible to apply a specifically selected fixing layer to the back of the course of bitumen at a comparatively late stage of the production process, which may have logistics advantages, among other advantages.

[0026] The present invention, according to a third aspect thereof, further relates to a method for covering a roof with roofing elements, comprising the steps of fixing of Velcro elements to a roof to be covered and attaching a roofing element according to the first aspect of the present invention to a number of Velcro elements fixed to the roof with a side of the roofing element that is provided with a nonwoven fibre material. The advantages of such a method have already been discussed in the discussion of the advantages of a roofing element according to the first aspect of the present invention.

[0027] It is preferable in that connection if subsequently, in a next step, another roofing element is attached to a number of Velcro elements with the side that is provided with a nonwoven fibre material, with a strip of the roofing element that is free from fixing material partially overlapping a previously installed roofing element.

[0028] In a preferred embodiment of the present invention, the Velcro elements arefixedto the roof in staggered relationship. Said staggered arrangement is possible because substantially the entire course of bitumen of the roofing element is provided with a material which can be engaged by the Velcro elements that are fixed to the roof. Once the roofing elements have been installed, it is no longer necessary to distinguish the location of the Velcro elements, because there is no need for a subsequent treatment, such as heating the locations in question as is done in the prior art, wherein the roofing elements must be fused together with slabs of bitumen that are fixed to the roof. The aforesaid staggered arrangement makes it possible to realise a better spreading of the points of attachment of the roofing elements over the roof and thus provide providing a better attachment of the roofing element to the roof.

[0029] The present invention will be further explained, purely by way of example, hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a bottom view of a multilayer roofing element according to the present invention;

Figure 2 is a cross-sectional view along the line II-II in figure 1; and

Figure 3 is a schematic view of a fixing method for a roofing element according to the present invention.

[0030] Figure 1 schematically shows a bottom view of a course 1 of a roofing material comprising a bituminous layer 2, which is largely covered with a nonwoven fibre material 3.

[0031] Figure 2 is a cross-sectional view along the line II-II in figure 1, showing the bituminous layer 2 with a layer of a separating foil 4 provided with perforations 5, which functions as an intermediate layer, applied thereto, on which a layer of a nonwoven fibre material 3 is present.

[0032] Figure 3 is a schematic sectional view of a roof with a roofing element 11 installed thereon. A layer of a vapour-inhibiting foil 12a with an overlying layer of an insulating material, which is locally provided with a Velcro element 14 that forms the hook side, has been placed on a hard surface 12. A screw 15 extends through the hook-side Velcro element 14 and the expanded polystyrene, which screw has been screwed into the hard surface. At the upper side, the screw 15 is surrounded by a mushroom-shaped element 16 of plastic material, on which the head of the screw engages. Present on the expanded polystyrene 13 and the hook-side Velcro elements 14 is a roofing element 11.

[0033] Now referring to figure 1, a bottom side is shown of a roofing element according to the present invention in the form of a course 1 of a roofing material comprising a bituminous layer 2, a separating foil (not shown in figure 1) and a layer of a nonwoven fibre material. The layer of nonwoven fibre material 3 extends substantially the entire length and substantially the entire width of the bituminous layer 2, and a strip of bitumen 2 has been kept free from the nonwoven fibre material 3 (in the present example) at one of the long sides and one of the short sides of the course 1. The proportions between the length and the width of the course 1 and the width of the strips that are kept free are schematically shown in figure 1, these proportions need not correspond to the proportions of a roofing element to be used in practice, in fact said proportions need not even be nearly the same. The width of the strip of bitumen 2 that are kept free will be selected so that it suffices for overlapping an adjacent course of bitumen when used on a roof, so that said strip can be fused together with the adjacent course, for example by means of a burner. It is also possible, however, to bond overlapping strips according to the present invention together by means of hot air or induction.

[0034] Figure 2 is a - likewise schematic - cross-sectional view along the line II-II in figure 1. In figure 2, the course 1 is shown in upside-down view. As figure 2 shows, the layer of nonwoven fibre material 3 is separated from a bituminous layer 2 in the present embodiment by means of a separating foil 4 provided with perforations 5. This strip of bitumen 2 on the left-hand side of figure 2 that is free from the nonwoven fibre material extends to above (and, when used on the roof, below) the layer of nonwoven fibre material 3. This is not a requirement, however, but it is preferred in order to be able to realise sufficient tensile strength over the entire area. The perforations 5 in the separating foil 4 allow bitumen to penetrate into the nonwoven fibre material 3 through the perforations when the course 1 is being heated for bonding the nonwoven fibre material 3 and the bitumen 2 together. Although said penetration only takes place to a limited extent, it provides an adequate bond between the two layers 2 and 3. The separating foil 4 may furthermore help to prevent two opposing layers of bitumen from adhering to each other during storage of bitumen 2, for example in the form of a roll, prior to the provision of the nonwoven fibre material 3, as a consequence of which the roll of bitumen cannot be unrolled any more, at least not without damaging the bitumen.

[0035] Figure 3, to conclude, shows the use of a roofing element 11 according to the present invention on a roof. A vapour-inhibiting layer 12a, with a layer of insulating material 13 of, in this example, polystyrene (also PIR or PUR may be used), is to that end installed on a hard surface 12 by screwing screws 15 having a large, flat head into the hard surface 12, in this case via a mushroom-shaped element 16 having an internal diameter which is sufficiently large for the shank of the screw 15 to extend therethrough but which prevents the head of the screw from penetrating into the inner circumference of the stem of the mushroom-shaped element 16. The head (not shown) of the screw may be countersunk in the mushroom-shaped element 16. The shaft of the mushroom-shaped element 16 is passed through the hook side of a Velcro element 14, in such a manner that the upper side of the mushroom-shaped element 16 fixes the hook-side Velcro element 14 with respect to the surface of the insulation material. Once the expanded polystyrene 13 has thus been fixed to a roof, a hook-side Velcro element is presented at all the locations where the expanded polystyrene 13 is fixed, together with a hook-side Velcro element 14, by means of screws 15 and such a mushroom-shaped element 16. When a roofing element 11 according to the present invention is placed on the expanded polystyrene 13, the nonwoven fibre material (not shown in figure 3) will be engaged by the hook-side Velcro elements, as a result of which a connection between the nonwoven fibre material and the hook-side of forming Velcro element is automatically effected. As is conventionally the case with Velcro elements, the mutual bond between the hook side and the nonwoven fibre material will be effected directly upon making contact. To prevent the roofing element 11 from adhering to the hook side prematurely upon being positioned, the hook side of the mushroom-shaped element 16 is provided with a protective foil, which is not removed until the roofing element is correctly oriented. The contact between the roofing element 11 and the mushroom-shaped element 16 that is thus made possible directly leads to a good bond between the two. After some time, especially after the exertion of a pressure at the location of the connection between the nonwoven fibre material and the hook-side Velcro element, the engagement between the hook-side Velcro element and the nonwoven fibre material will become stronger. The strength of the connection can be predetermined, inter alia, by the selection of materials, and Velcro elements comprising comparatively many hook elements and many loop elements will form a comparatively stronger connection than Velcro elements comprising relatively few hook elements and relatively few loop elements per unit area.

[0036] Only a few embodiments of the present invention have been shown and discussed in the figures and the above description. The figures and the description

by no means limit the scope of the present invention, however, which is determined by the appended claims. Several variants are available to those skilled in the art, which variants must be considered to fall within the scope of protection of the present invention. Thus, in those cases where the term "nonwoven fibre material" is used herein, it is also possible to use any other material that is capable of providing a loop side of a Velcro element. It is of course possible to mutually exchange Velcro elements with a side and Velcro elements with a loop side, in the sense that the elements having a hook side are provided with a loop side and vice versa.

Claims

1. A multilayer roofing element (1) comprising a bituminous coating (2) and a back side that comprises a material other than bitumen, the back side comprising a fixing layer extending substantially the entire length and substantially the entire width of the bituminous coating (2) and is suitable for engagement by the hook side (14) of a Velcro element that is fixed to the roof, the roofing element (1) having a rectangular circumferential edge, **characterised in that** the fixing layer (3) extends to a distance of at least 1 centimetre from the circumferential edge of the coating (2) on at least one side of the rectangle. Keeping a strip of bitumen of at least 1 cm free from the material other than bitumen.

2. A roofing element according to claim 1, **characterised in that** the fixing layer comprises a nonwoven fibre material (3).

3. A roofing element according to any one or more of the preceding claims, **characterised in that** the fixing layer preferably comprises polypropylene and/or polyester.

4. A roofing element according to any one or more of the preceding claims, **characterised in that** the fixing layer extends to a distance of at least 1 centimetre from the long side of the circumferential edge of the coating (2).

5. A roofing element according to any one or more of the preceding claims, **characterised in that** the fixing layer extends to a distance of at least 1 centimetre from at least substantially the entire circumferential edge of the roofing element.

6. A roofing element according to any one or more of the preceding claims, **characterised in that** an intermediate layer is provided between the coating (2) and the fixing layer.

7. A roofing element according to claim 6, **characterised in that** the intermediate layer comprises a foil (4) that is provided with perforations (5).

8. A roofing element according to claim 6 or 7, **characterised in that** the intermediate layer comprises PE.

9. A roofing element according to any one or more of the preceding claims, **characterised in that** the bituminous coating (2) has a thickness of less than 3.8 mm.

10. A roofing element according to claim 9, **characterised in that** the bituminous coating (2) has a thickness of less than 3.5 mm.

11. A roofing element according to any one or more of the preceding claims, **characterised in that** identification means are provided for identifying the roofing element in question.

12. A roofing element according to claim 11, **characterised in that** the identification means comprise a chip.

13. A roofing element according to claim 11 or 12, **characterised in that** the identification means comprise a transmitter for reading of the identification from a remote location.

14. A method for manufacturing a multilayer roofing element (1) according to any one or more of the preceding claims, comprising the steps of applying a course of a bituminous layer (2) to a layer of a nonwoven material (3), wherein a strip of bitumen of at least 1 centimetre, seen from the edge of the course, is kept free from nonwoven material (3) on at least one side of the course, and bonding together the bitumen and the nonwoven material (3).

15. A method according to claim 14, **characterised in that** at least substantially rectangular course of bitumen is laid out on the surface to be covered.

16. A method according to claim 14 or 15, **characterised in that** a strip of bitumen of at least 1 centimetre, seen from the circumferential edge of the course, is kept free from nonwoven fibre material (3) when carrying out the step of applying a nonwoven material (3) to the back side of the bituminous layer.

17. A method according to any one of the claims 14-16, **characterised in that** an intermediate layer is applied to the nonwoven fibre material (3), prior to the step of applying bitumen, for the purpose of adhering the nonwoven fibre material (3) thereto.

18. A method for covering a roof with roofing elements (1, 11), comprising the steps of fixing of Velcro ele-

ments (14), with the hook side facing upwards, to a roof to be covered and attaching a roofing element (1, 11) according to any one or more of the claims 1-13 to a number of the Velcro elements (14) fixed to the roof with a side of the roofing element that is provided with a nonwoven fibre material (3).

19. A method according to claim 18, **characterised in that** subsequently, in a next step, another roofing element according to any one or more of the claims 1-13 is attached to a number of the Velcro elements (14) with the side that is provided with a nonwoven fibre material (3), with a strip of the roofing element that is free from fixing material partially overlapping a previously installed roofing element.

20. A method according to claim 18 or 19, **characterised in that** the Velcro elements (14) are fixed to the roof in staggered relationship.

Patentansprüche

1. Mehrschichtiges Dachelement (1) mit einer bituminösen Beschichtung (2) und einer Rückseite, die ein anderes Material als Bitumen umfasst, wobei die Rückseite eine Befestigungsschicht umfasst, die sich im Wesentlichen über die gesamte Länge und im Wesentlichen die gesamte Breite der bituminösen Beschichtung (2) erstreckt und in welche die Häkchenseite (14) eines an dem Dach befestigten Klettelements eingreifen kann, wobei das Dachelement (1) einen rechteckigen Umfangsrand besitzt, **dadurch gekennzeichnet, dass** sich die Befestigungsschicht (3) bis auf einen Abstand von mindestens 1 Zentimeter vom Umfangsrand der Beschichtung (2) auf mindestens einer Seite des Rechtecks erstreckt, wobei ein Streifen aus Bitumen von mindestens 1 Zentimeter frei von einem anderen Material als Bitumen gehalten wird.

2. Dachelement nach Anspruch 1, **dadurch gekennzeichnet, dass** die Befestigungsschicht ein Faservliesmaterial (3) umfasst.

3. Dachelement nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Befestigungsschicht vorzugsweise Polypropylen und/oder Polyester umfasst.

4. Dachelement nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sich die Befestigungsschicht bis auf einen Abstand von mindestens 1 Zentimeter von der Längsseite des Umfangsrandes der Beschichtung (2) erstreckt.

5. Dachelement nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sich die Befestigungsschicht bis auf einen Abstand von mindestens 1 Zentimeter von zumindest im Wesentlichen dem gesamten Umfangsrand des Dachelements erstreckt.

6. Dachelement nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** eine Zwischenschicht zwischen der Beschichtung (2) und der Befestigungsschicht vorgesehen ist.

7. Dachelement nach Anspruch 6, **dadurch gekennzeichnet, dass** die Zwischenschicht eine Folie (4) umfasst, die mit Perforationen (5) versehen ist.

8. Dachelement nach Anspruch 6 oder 7, **dadurch gekennzeichnet, dass** die Zwischenschicht PE umfasst.

9. Dachelement nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die bituminöse Beschichtung (2) eine Dicke von weniger als 3,8 mm hat.

10. Dachelement nach Anspruch 9, **dadurch gekennzeichnet, dass** die bituminöse Beschichtung (2) eine Dicke von weniger als 3,5 mm hat.

11. Dachelement nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** Identifikationsmittel vorgesehen sind, um das fragliche Dachelement zu identifizieren.

12. Dachelement nach Anspruch 11, **dadurch gekennzeichnet, dass** die Identifikationsmittel einen Chip umfassen.

13. Dachelement nach Anspruch 11 oder 12, **dadurch gekennzeichnet, dass** die Identifikationsmittel einen Sender umfassen, um die Identifikation von einem entfernten Ort auszulesen.

14. Verfahren zur Herstellung eines mehrschichtigen Dachelements (1) nach einem oder mehreren der vorhergehenden Ansprüche, mit den folgenden Schritten: Aufbringen einer Lage einer bituminösen Schicht (2) auf eine Schicht eines Vliesmaterials (3), wobei ein Streifen Bitumen von mindestens 1 Zentimeter, gesehen vom Rand der Lage, auf mindestens einer Seite der Lage von Vliesmaterial (3) freigehalten wird, und Zusammenkleben des Bitumens und des Vliesmaterials (3).

15. Verfahren nach Anspruch 14, **dadurch gekennzeichnet, dass** eine zumindest im Wesentlichen rechteckige Lage Bitumen auf der zu bedeckenden Oberfläche ausgelegt wird.

16. Verfahren nach Anspruch 14 oder 15, **dadurch gekennzeichnet, dass** ein Streifen Bitumen von mindestens 1 Zentimeter, gesehen vom Umfangsrand der Lage, bei der Durchführung des Schrittes des Aufbringens eines Vliesmaterials (3) auf die Rückseite der bituminösen Schicht von Faservliesmaterial (3) freigehalten wird.

17. Verfahren nach einem der Ansprüche 14-16, **dadurch gekennzeichnet, dass** vor dem Schritt des Aufbringens von Bitumen eine Zwischenschicht auf das Faservliesmaterial (3) aufgebracht wird, um das Faservliesmaterial (3) daran festzukleben.

18. Verfahren zum Bedecken eines Daches mit Dachelementen (1, 11), mit den Schritten des Befestigens von Klettelementen (14), mit der Häkchenseite nach oben, an einem zu bedeckenden Dach und des Befestigens eines Dachelements (1, 11) nach einem oder mehreren der Ansprüche 1-13 an einer Anzahl der Klettelemente (14), die mit einer Seite des Dachelements, die mit einem Faservliesmaterial (3) versehen ist, an dem Dach befestigt sind.

19. Verfahren nach Anspruch 18, **dadurch gekennzeichnet, dass** anschließend, in einem nächsten Schritt, ein weiteres Dachelement nach einem oder mehreren der Ansprüche 1-13 mit der Seite, die mit einem Faservliesmaterial (3) versehen ist, an einer Anzahl der Klettelemente (14) befestigt wird, wobei ein Streifen des Dachelements, der frei von Befestigungsmaterial ist, ein zuvor angebrachtes Dachelement teilweise überlappt.

20. Verfahren nach Anspruch 18 oder 19, **dadurch gekennzeichnet, dass** die Klettelemente (14) versetzt zueinander an dem Dach befestigt sind.

Revendications

1. Elément de toiture multicouches (1) comprenant un revêtement bitumineux (2) et un côté arrière qui comprend un matériau différent du bitume, le côté arrière comprenant une couche de fixation s'étendant sensiblement sur toute la longueur et sensiblement sur toute la largeur du revêtement bitumineux (2), et adapté pour se mettre en prise par le côté à crochet (14) d'un élément Velcro qui est fixé au toit, l'élément de toiture (1) ayant un bord circonférentiel rectangulaire, **caractérisé en ce que** la couche de fixation (3) s'étend sur une distance d'au moins 1 centimètre par rapport au bord circonférentiel du revêtement (2) sur au moins un côté du rectangle, en gardant une bande de bitume d'au moins 1 centimètre exempts de matériaux autres que le bitume.

2. Elément de toiture selon la revendication 1, **caractérisé en ce que** la couche de fixation comprend un matériau en fibre non tissé (3).

3. Elément de toiture selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** la couche de fixation comprend de préférence du polypropylène et/ou du polyester.

4. Elément de toiture selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** la couche de fixation s'étend sur une distance d'au moins 1 centimètre du côté long du bord circonférentiel du revêtement (2) .

5. Elément de toiture selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** la couche de fixation s'étend sur une distance d'au moins 1 centimètre par rapport à au moins sensiblement tout le bord circonférentiel de l'élément de toiture.

6. Elément de toiture selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce qu'**une couche intermédiaire est ménagée entre le revêtement (2) et la couche de fixation.

7. Elément de toiture selon la revendication 6, **caractérisé en ce que** la couche intermédiaire comprend une feuille (4) dotée de perforations (5).

8. Elément de toiture selon la revendication 6 ou 7, **caractérisé en ce que** la couche intermédiaire comprend du PE.

9. Elément de toitue selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** le revêtement bitumineux (2) a une épaisseur inférieure à 3,8 mm.

10. Elément de toiture selon la revendication 9, **caractérisé en ce que** le revêtement bitumineux (2) a une épaisseur inférieure à 3,5 mm.

11. Elément de toiture selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** moyens d'identification sont fournis pour indentifier l'élément de toiture en question.

12. Elément de toiture selon la revendication 11, **caractérisé en ce que** les moyens d'identification comprennent une puce.

13. Elément de toiture selon la revendication 11 ou 12, **caractérisé en ce que** les moyens d'identification comprennent un émetteur pour lire l'identification à partir d'un emplacement éloigné.

14. Procédé de fabrication d'un élément de toiture mul-

ticouche (1) selon l'une quelconque ou plusieurs des revendications précédentes, comprenant les étapes consistant à appliquer une couche d'un revêtement bitumineux (2) sur une couche de matériau non tissé (3), dans lequel une bande de bitume d'au moins 1 centimètre, vue depuis le bord de la couche, reste dénuée de matériau non tissé (3) sur au moins un côté de la couche, et en collant ensemble le bitume et le matériau non tissé (3).

15. Procédé selon la revendication 14, **caractérisé en ce qu'**au moins une couche sensiblement rectangulaire du bitume est disposée sur la surface à recouvrir.

16. Procédé selon la revendication 14 ou 15, **caractérisé en ce qu'**une bande de bitume d'au moins 1 centimètre, vue depuis le bord circonférentiel de la couche, reste dénuée de matériau de fibre non tissé (3) lors de la réalisation de l'étape d'application d'un matériau non tissé (3) sur le côté arrière de la couche bitumineuse.

17. Procédé selon l'une quelconque des revendications 14-16, **caractérisé en ce qu'**une couche intermédiaire est appliquée au matériau de fibre non tissé (3), avant l'étape d'application de bitume, dans le but de faire adhérer le matériau de fibres non tissé (3) dessus.

18. Procédé de couverture d'un toit avec des éléments de toiture (1, 11) comprenant les étapes consistant à fixer les éléments Velcro (14) avec le côté crochet orienté vers le haut, à un toit à recouvrir et à fixer un élément de toiture (1, 11) selon une ou plusieurs des revendications 1-13, à un certain nombre des éléments Velcro (14) fixés au toit, un côté de l'élément de toiture étant doté d'un matériau de fibre non tissé (3).

19. Procédé selon la revendication 18, **caractérisé en ce qu'**ensuite, dans une prochaine étape, un autre élément de toiture selon une ou plusieurs des revendications 1-13 est fixé à un certain nombre des éléments Velcro (14), avec le côté qui est doté d'un matériau de fibre non tissé (3), avec une bande d'élément de toiture qui est dénué de matériau de fixation recouvrant partiellement un élément de toiture précédemment installé.

20. Procédé selon la revendication 18 ou 19, **caractérisé en ce que** les éléments de Velcro (14) sont fixés au toit selon une relation en quinconce.

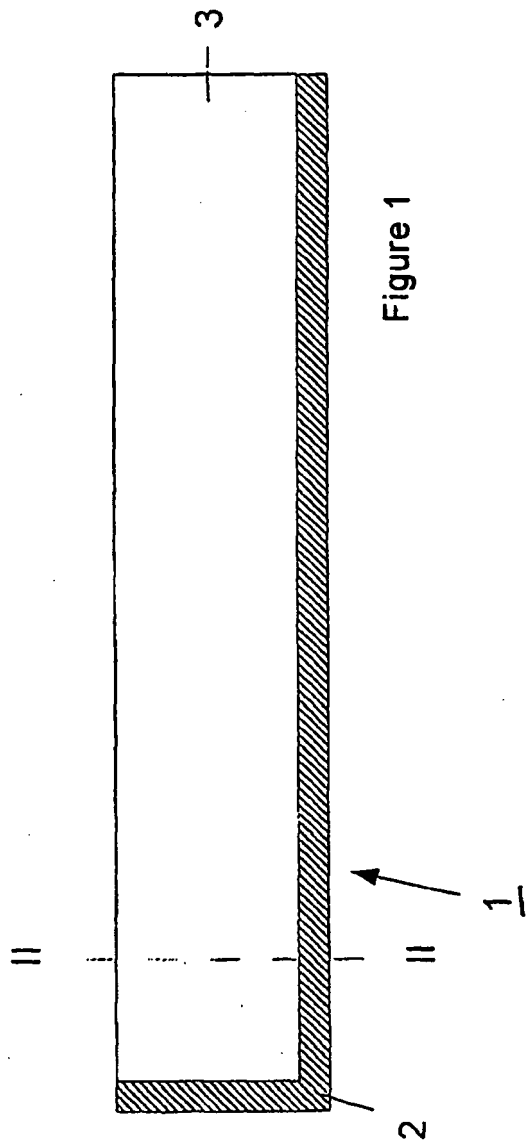

Figure 1

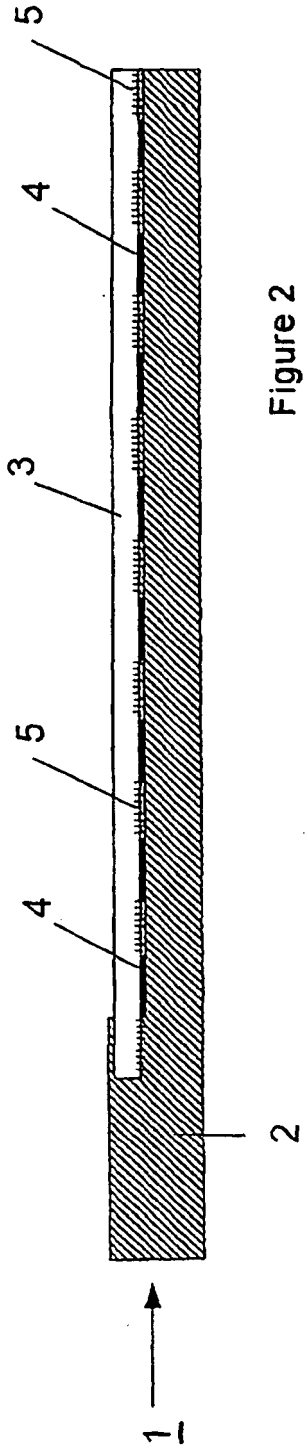

Figure 2

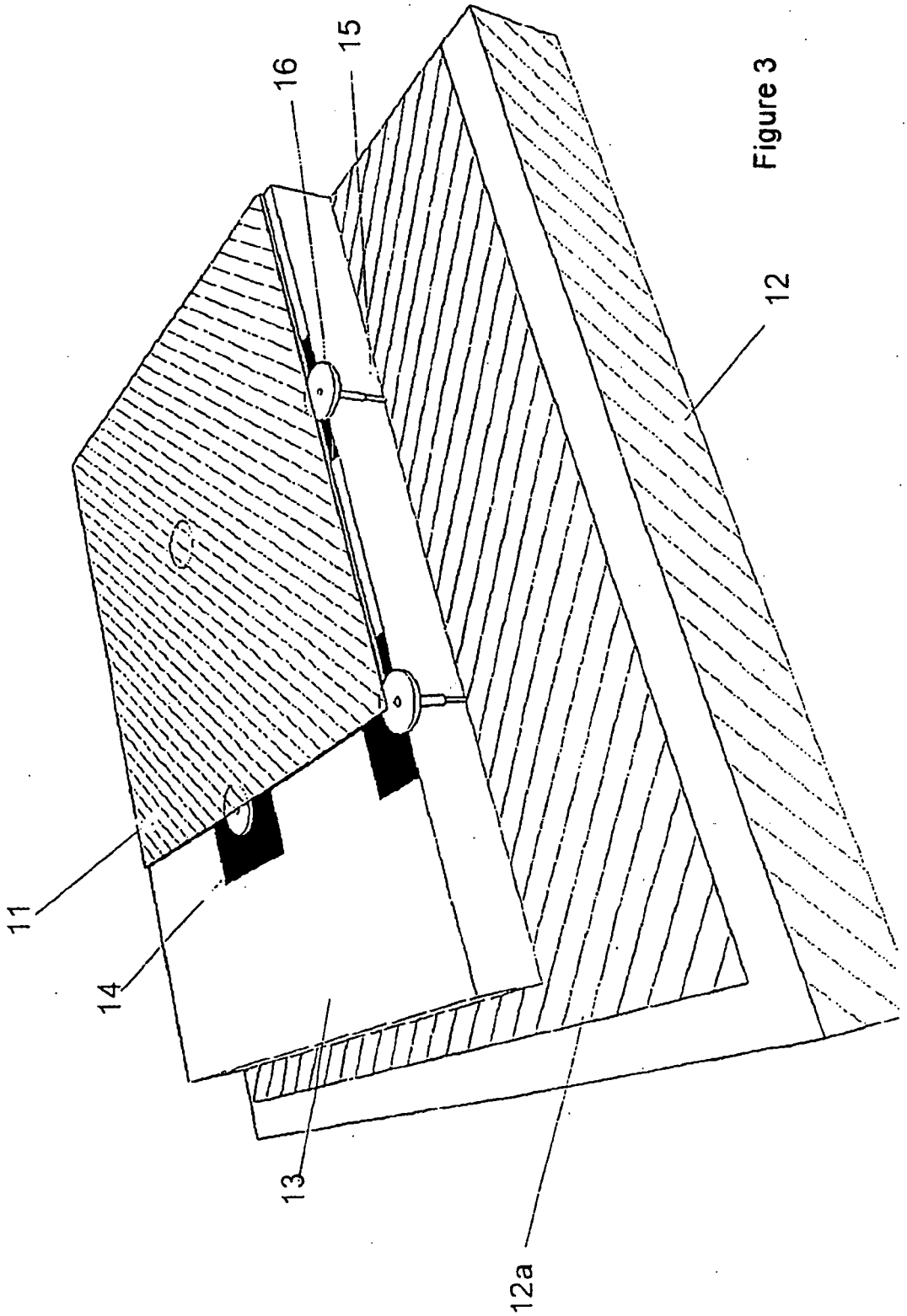

Figure 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- WO 9836139 A1 **[0005]**
- DE 19752819 A1 **[0006]**