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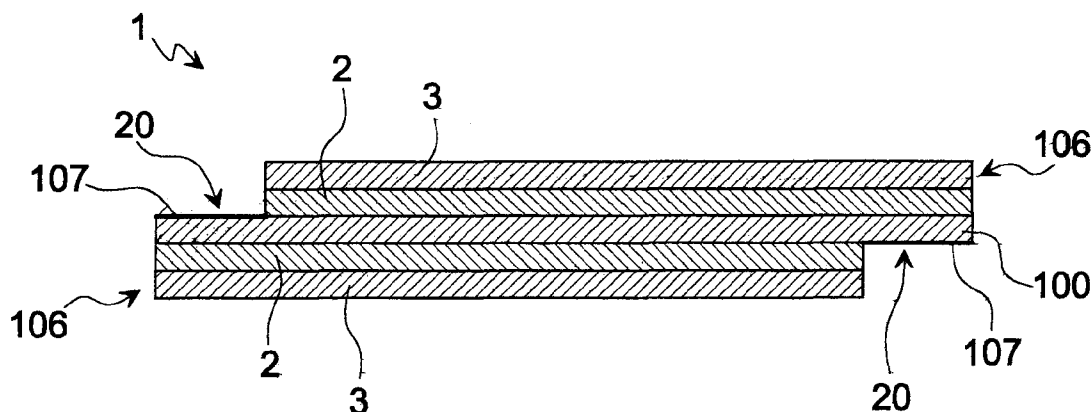
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

Published:

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A WATERPROOF SHEET AND A PROCESS FOR THE MANUFACTURING THEREOF



(57) Abstract: There is described a sheet comprising two layers (2 and 100) of waterproof materials arranged between a first (3) and a second (3) layer of spunbonded fabric made of reinforced polyester. The two layers of reinforced and waterproof polyester spunbonded fabrics (103) are laterally offset one with respect to the other so as to form a protrusion (20) of the first layer with respect to the second layer on one side and a protrusion (20) of the second layer with respect to the first layer on the opposite side. Layer (100) of waterproof material is a layer of plastomeric film having such a width as to cover said protrusions (20).

WO 2007/077182 A1

“A waterproof sheet and a process for the manufacturing thereof”.

* * * *

DESCRIPTION

5 The present invention relates to a waterproof sheet and a process for the manufacturing thereof.

Waterproof products employed when a protection from water is needed, are known in the state of the art; some of said products are, for example, bituminous membranes, sheets made of PVC, sheets made of rubber, etc..

10 Bituminous membranes are manufactured by immersing frameworks, among which polyester spunbonded fabrics, in a bath of bituminous mixture which is warm enough to obtain, after cooling, rolls displaying a height of approximately 1 metre, a length of approximately 10 metres and a weight varying from 350 g/sqm to 5 kg/sqm and greater. The laying occurs by
15 unwinding the roll of membrane on the surface to waterproof, inducing it to adhere mainly by means of flame-hardening of the back with a flame blow-pipe, in order for the slightly molten part to attach to the surface. Another membrane roll is unwound parallelly to the first one taking care to overlap it by a width of at least 5 cm. The overlapping part is flame-hardened and
20 pressed along the contact line in order to link the two layers of membrane. The critical part is the junction area between the rolls, which may allow the penetration of water if not properly manufactured.

The membranes made of PVC are synthetic sheets obtained by extrusion of “polyvinyl chloride” polymer. Generally commercially available
25 rolls have a height even taller than one metre, lengths of 15 – 20 m and different thicknesses. The roll is stretched out on the surface and another roll is stretched out parallelly to the first taking care to overlap it by a width of a least 10 cm. The overlapping part is linked by means of a chemical compound which fuses the PVC on the surface or by means of a hot air gun
30 that melts and links the overlapping edges, by exploiting the low melting

point of the PVC. An inert layer is normally deposited on the PVC layers, having the function of makeweight, in order to allow the attachment of the PVC membrane to the surface. A possible penetration of water, caused by poor junctions, does not remain restricted to the penetration spot and instead spreads under the cover.

5

In view of the state of the art, it is the object of the present invention to provide a waterproof sheet displaying advantages for the engineering fields as compared to “traditional” products, as e.g. laying rates and ease, lightness, decrease of the critical overlapping spots, motion on the construction site, storage room occupied, costs.

10

According to the present invention, said object is achieved by means of a sheet comprising at least one layer of waterproof material arranged between a first and a second layer of spunbonded fabric, characterised in that said layers of spunbonded fabric have a surface covered by waterproof material and are laterally offset one with respect to the other so as to display a projection of the first layer with respect to the second layer on one side and a projection of the second layer with respect to the first layer on the opposite side, in that said at least one layer of waterproof material is comprised of a plastomeric film and in that said projections having waterproof material are visible in order to allow a better adhesion between the sheets.

15

20

According to the present invention a process for the manufacturing of a sheet according to claim 5 is also provided.

The features of the present invention will become more apparent from the following description of a practical embodiment, illustrated by way of non-limitative example in the accompanying drawings, in which:

25

figure 1 is a diagrammatic view of a first step of the process for the manufacturing of the waterproof sheet according to the present invention;

figure 2 is a diagrammatic view of a second step of the process for the manufacturing of the waterproof sheet according to the present invention;

30

figure 3 is a longitudinal section view of the final sheet of figure 2;

figure 4 is a diagrammatic cross-sectional view taken along line IV-IV of the sheet of figure 2;

figure 5 is a diagrammatic view of a cover formed with the sheet according to the invention.

5 With reference to figures 1-5, there is shown a waterproof sheet 1 for buildings according to the present invention.

Said sheet 1 is manufactured through a first step, in which a plastomeric film 2 is extruded from an extruder 101 on a surface of a layer 3 of spunbonded fabric, for example, made of reinforced polyester, deriving from a roll 102 to form a roll 103 of waterproof spunbonded fabric 106, i.e. with plastomeric film adhering thereto (figure 1).

10 In a second step of the manufacturing process, two layers of spunbonded fabric 106 deriving from two rolls 103 are coupled one to the other with the interposition of a further plastomeric film 100 deriving from an extruder 105 (for example, the same above-mentioned extruder 101) to form a roll 104 of waterproof sheet 1 (figure 2). In this way, the absolute continuity of the waterproof film is guaranteed without the possibility of the occurrence of leaks.

15 The manufactured sheet (figure 3) therefore comprises a waterproof plastomeric film 100, obtained with a polymeric mixture (for example, in our case, comprised of PET = 20% and PP = 80%), fused with two layers 2 of polymeric mixture, protected by two layers 3 of spunbonded fabric. The insertion of film 100 is carried out in order to avoid leaks from occurring in the waterproof layer and to allow the complete adhesion adapted to form waterproof sheet 104. Layers 3 are adapted to serve as a mechanical protection for films 2 and 100 and to also provide an extreme dimensional stability, in particular if they are in turn reinforced with high toughness longitudinal filaments. Layer 100 has an extension greater than each layer 106; layers 106 preferably have an identical extension.

25
30 In sheet 1 obtained in this manner, the two layers of spunbonded fabric

are laterally offset one with respect to the other, i.e. the side ends of layers 106 are not reciprocally aligned, so as to leave two side portions 20 of layers 106 free, the two side portions being arranged by the sides of the sheet, (figure 4). Each side portion 20 extends for the whole length of the sheet and has a suitable width for the adhesion in the application step. The presence of

5 said offset side portions 20 allows the coupling of different sheets 1.

The laying occurs by unwinding a first roll of sheet 1 on a surface. A second roll of sheet 1 is stretched out parallelly to the first but so that the offset side portions 20 of the two sheets are arranged one on the other taking

10 care to match them (figure 5). In this manner, the junction does not occur on the layer on spunbonded fabric, which is always a porous element, but on film 100 instead. The overlapping side portions 20 are linked to one another by means of waterproof butyl-based or acryl-based or other adhesive means

107.

The laying technique does not require the use of special equipment and the laying may also take place in the presence of water.

15

If it is desired to let sheet 1 adhere to the surface, inert material may be used as makeweight or the surface may be brushed with a bituminous primer (to which the spunbonded fabric is perfectly suited) and then induce sheet 1

20 to adhere.

Sheet 1 is adapted to protect the surfaces from the penetration of water.

Figure 5 shows a cover to protect a floor from the penetration of water with sheets 1 according to the invention, before the construction of the new

25 paving.

CLAIMS

1. A sheet comprising at least one layer (2, 100) of waterproof material arranged between a first (3) and a second (3) layer of spunbonded fabric, characterised in that said first (103) and said second (103) layer of spunbonded fabric have a surface covered by waterproof material (2) and are laterally offset one with respect to the other so as to form a protrusion (20) of the first layer with respect to the second layer on one side and a protrusion (20) of the second layer with respect to the first layer on the opposite side, and in that the layers of waterproof material are made of plastomeric film having such a width as to cover said protrusions (20).

2. A sheet according to claim 1, characterised in that the layers of spunbonded fabric (3) are layers of spunbonded fabric made of reinforced polyester (102).

3. A sheet according to claim 1, characterised in that it comprises the use of adhesive means (107) arranged on the protrusions (20).

4. A sheet according to claim 1, characterised in that the layers (2 and 100) of plastomeric film are made of mixtures of synthetic polymers.

5. A manufacturing process of a waterproof sheet comprising a first step for the extrusion on a layer (3) of spunbonded fabric of a layer of plastomeric film (2) thus obtaining a roll (103) of waterproof spunbonded fabric and a second step for the extrusion of a layer (100) of plastomeric film between two layers (103) of waterproof spunbonded fabric.

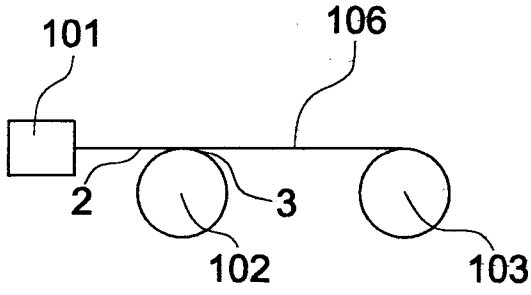


Fig. 1

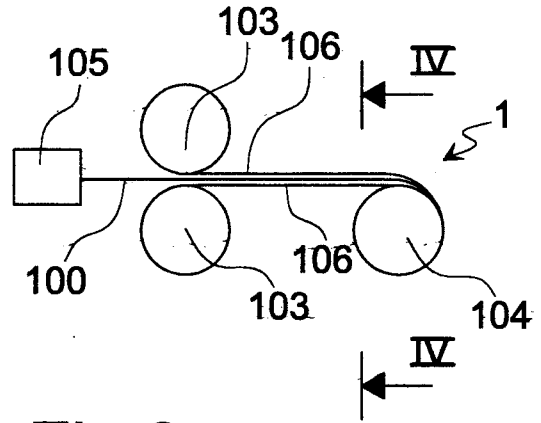


Fig. 2

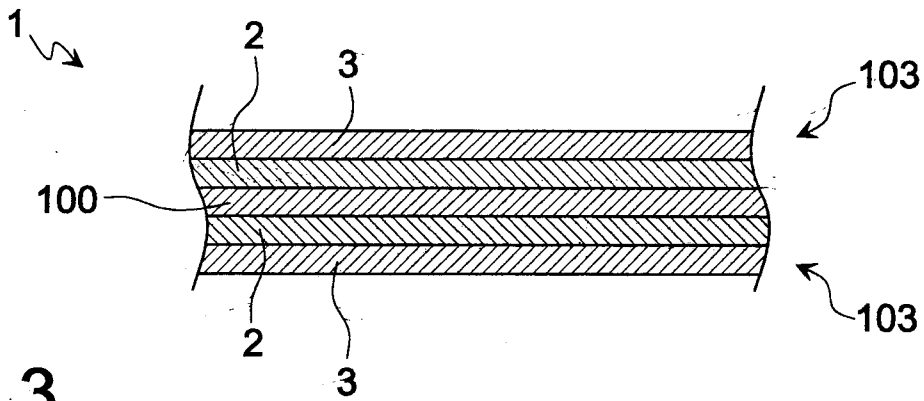


Fig. 3

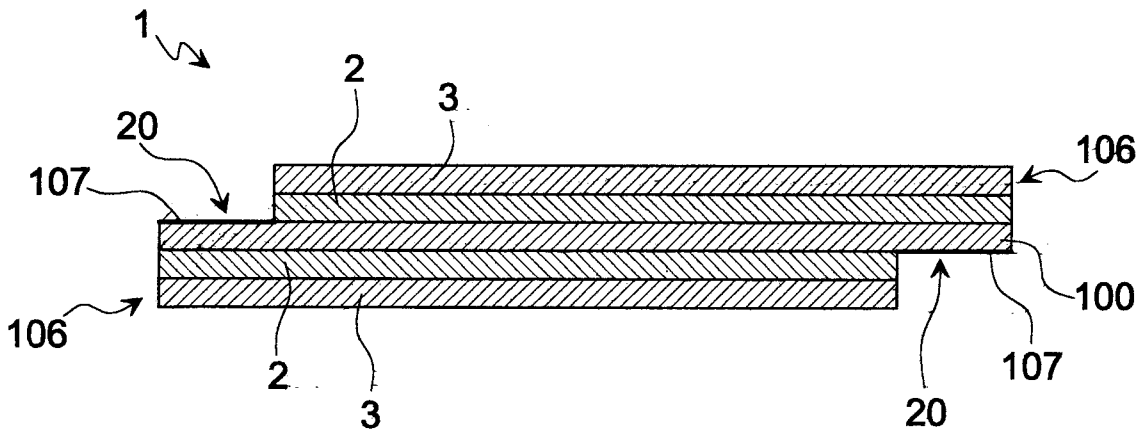


Fig. 4

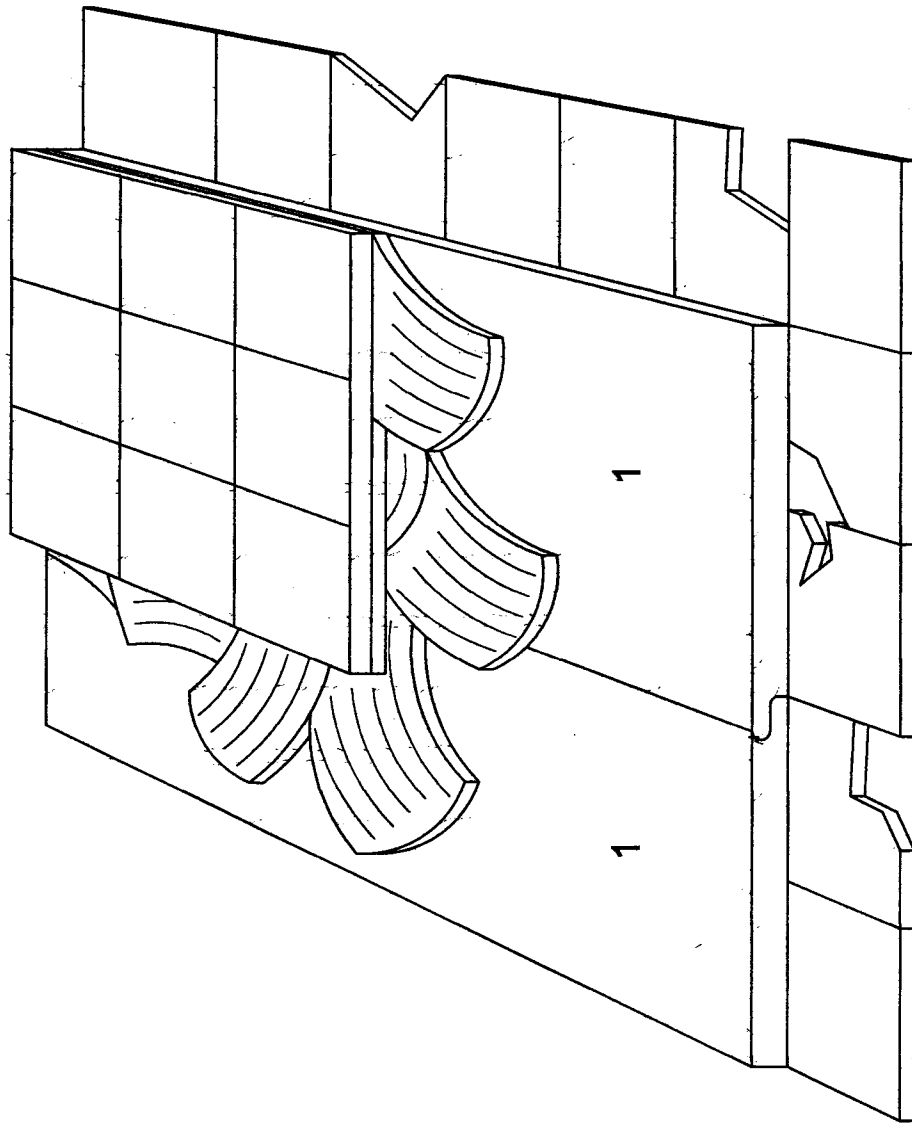


Fig.5

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. B32B27/00 D04H13/00

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)
B32B D04H

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 100 208 A (BROWN TRINA BUCE [US] ET AL) 8 August 2000 (2000-08-08) claim 1	5

Further documents are listed in the continuation of Box C.

See patent family annex.

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6100208	A	08-08-2000	CA 2266537 A1	07-05-1998
			DE 69736011 T2	23-11-2006
			EP 0979166 A1	16-02-2000
