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(71) Applicant: **L.B. Benedict Holding B.V.**
3223 EZ Hellevoetsluis (NL)

(72) Inventor: **Benedict, Leonard Bert**
3223 EZ Hellevoetsluis (NL)

(74) Representative: **Patentwerk B.V.**
P.O. Box 1514
5200 BN 's-Hertogenbosch (NL)

(54) **ROOF MATERIAL TO BE APPLIED TO A FLAT ROOF IN ORDER TO FIX ROOF COVERING**

(57) The invention relates to roof material which is to be applied to a flat roof and is designed to fix a section of roof covering which is to be applied to the roof, wherein the roof material is provided with a carrier which is to be attached to the roof, is provided with adhesive material on its top side and is connected to the adhesive material.

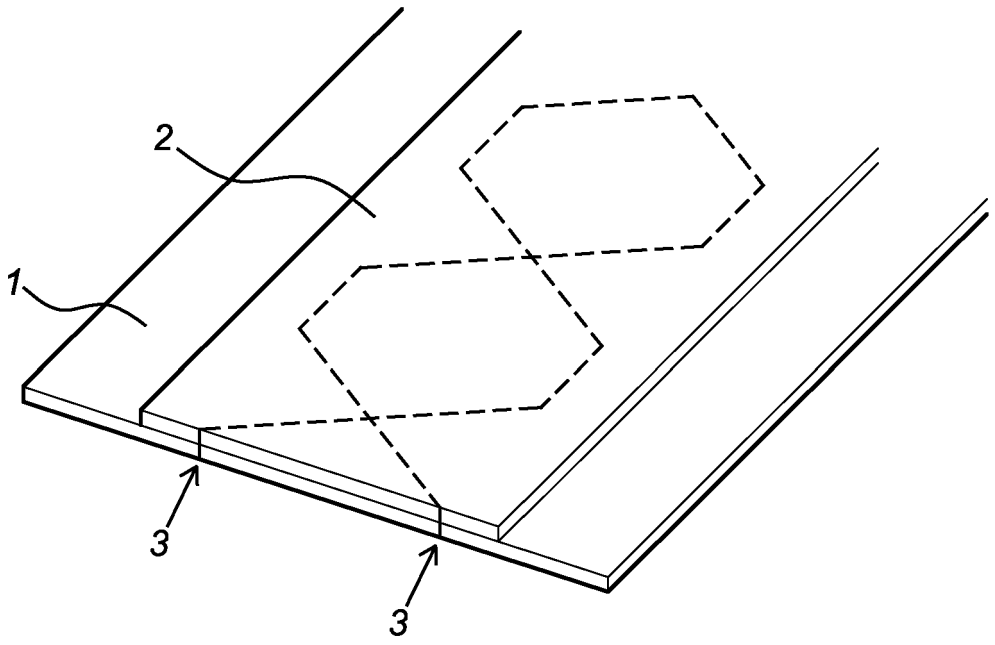

Fig. 1

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Description

[0001] The invention relates to roof material which is to be applied to a flat roof and is designed to fix a section of roof covering which is to be applied to the roof, wherein the roof material is provided with a carrier which is to be attached to the roof, is provided with adhesive material on its top side and is connected to the adhesive material.

[0002] Experience has shown that it is not necessary for the roof material to be adhered to the roof covering over the entire surface of the roof.

[0003] To this end, the invention provides, in a first aspect, the measure of applying the adhesive material to the carrier in the form of separate strips. The strips only cover a small part of the total surface of the roof.

[0004] Separate strips should be understood to mean that the strips of adhesive material are situated at a distance from one another on the carrier. This aspect is also illustrated in the attached figures which are discussed below.

[0005] Preferably, the measures according to Claims 2 and 3 are applied.

[0006] It is preferable for the strip of adhesive material to be adhesive material provided with hooks and for the adhesive material present on the underside of the section of roof covering to be adhesive material provided with loops, although the reverse situation is not precluded. This type of adhesive material provided with hooks is also known as hook-and-loop material or 'Velcro'.

[0007] If roof covering is only connected to the roof material attached to the roof over part of its surface, wind may blow between the roof material and the roof covering in the event of a storm. It is also possible that the wind creates a local vacuum above the roof covering. Both phenomena cause an upwards force to be exerted on the roof covering which must be absorbed by the connection between the adhesive material. Since most types of adhesive material are only able to withstand a limited force transverse to their surface without breaking the connection, a relatively large surface area of adhesive material is needed if strong wind loads are expected, such as in the case of tall buildings.

[0008] In order to be able to use less adhesive material, a preferred embodiment proposes that the linear seam is located at the edge of the strip of adhesive material.

[0009] If a space is created between the roof covering and the roof material owing to wind load, the roof covering will billow out. Since the strip of adhesive material for the roof material is only connected to the roof material at the seam, the adhesive material will also deform with the roof covering and the adhesive material will remain parallel to the roof covering. The connection between the adhesive material and the roof covering is then also subject to shear. Most adhesive materials have a higher capacity for shear than for tensile forces transverse to their surface, which means that less adhesive material is needed. This may lead to a saving of more than 50% on the adhesive material. It is of course possible to make the strips of adhesive material narrower, but it is more attractive to increase the distance between the sections of roof material, since this means that it is not only possible to save on the amount of adhesive material, such as Velcro, but that it possible to use fewer strips of roof material. This does not only save on material, but also on the labour of applying the strips, since fewer strips need to be applied.

[0010] The invention preferably relates to a section of roof material in which the strips of adhesive material are connected to the carrier section by means of at least one sewed seam.

[0011] The invention preferably relates to a section of roof material in which the carrier section is provided with a heat-resistant layer on its top side.

[0012] The invention preferably relates to a section of roof material in which the heat-resistant layer is connected to the carrier section by means of the sewed seam.

[0013] The carrier section must of course be connected to the substrate. Since the play of forces is also dependent on the place where the carrier section is connected to the substrate, the measure of connecting the carrier section to the substrate between both attachment seams is preferably used.

[0014] It is furthermore attractive to use screw connections. This can lead to a good adhesion between the substrate and the section of roof material, owing to plates, preferably of metal, which extend under the screw head. In a number of configurations the screw connections extend in a line. In this case it is possible to use profiles, preferably of metal, under the screw heads, so that the forces are distributed.

[0015] Other attractive embodiments are evident from the remaining subclaims.

[0016] A second aspect of the invention relates to the following preferred embodiments:

- A section of roof material arranged on a substrate according to the first aspect of the invention, characterized by the fact that the section of roof material is attached to the substrate by means of a screw connection.

- A section of roof covering arranged on a substrate, which is fixed by means of a section of roof material according to the first aspect of the invention, characterized by the fact that the section of roof material is connected to the substrate by means of a screw connection, and by the fact that the section of roof covering is connected to the section of roof material by means of the adhesive material.

- A section of roof covering arranged on a substrate according to the second aspect of the invention, in which the entire width of the section of roof material is covered by only a single section of roof covering.

- A section of roof covering arranged on a substrate according to the second aspect of the invention, in

which the section of roof covering is elongate, and in which the longitudinal direction of the section of roof covering corresponds to the longitudinal direction of the section of roof material.

- A section of roof covering arranged on a substrate according to the second aspect of the invention, in which the section of roof covering is elongate, and in which the longitudinal direction of the section of roof covering is at right angles to the longitudinal direction of the section of roof material.

- A section of roof covering arranged on a substrate according to the second aspect of the invention, in which an edge of the section of roof covering extends over the section of roof material in the longitudinal direction of the section of roof material.

- A combination of at least two adjoining sections of roof covering arranged on a substrate according to the second aspect of the invention, in which the seam between the two sections of roof covering extends over the section of roof covering in the longitudinal direction of the section of roof material.

[0017] The invention is described in more detail below with reference to the attached figures.

Figure 1 shows a first embodiment in which a strip of adhesive material 2 is attached to a carrier section 1 by means of a sewed seam 3. The sewed seam 3 extends over a large part of the width of the strip of adhesive material 2 in the manner of a zigzag.

Figure 2 shows a preferred embodiment in which the strip of adhesive material 2 is likewise connected to the carrier section 1 by means of a sewed seam 3 and in which the sewed seam is located in the vicinity of an edge of the strip of adhesive material 2 in order to obtain the effect of this preferred embodiment. The carrier section is connected to the substrate by means of screws 5 on the side of the sewed seam 3 opposite the strip of adhesive material.

Figure 3 shows the effect of the measures according to the preferred embodiment. It can be seen that the connection between the strip of adhesive material and the roof covering is primarily subject to shear. In this embodiment, screws 5 are arranged on both sides of the sewed seam in order to attach the carrier to the substrate.

Figure 4 shows a double embodiment and Figure 5 shows a double embodiment in which a strip of heat-reflecting foil is also applied.

Figure 6 shows a cross section of a section of roof material which is in the form of an elongate strip, with a section of roof covering adhering to the strip of roof material. This embodiment also comprises a carrier section 1 which is made, for example, of nonwoven material and two strips of adhesive material 2 which are both connected to the carrier section by means of a sewed seam 3 and in which the sewed seams 3 are each located at the edge of the strip of adhesive material 2 facing the other strip of adhesive material 2. The free strip between the sewed seams 3 is connected to the substrate 7 of the roof by means of screws 6. A supporting plate 9 is in each case arranged between the head 8 of each of the screws and the respective strip of adhesive material. In this embodiment, a section of roof covering 10 extends over the entire width of the strip of roof material. A layer of adhesive material 11 connected to the strips of adhesive material 2 is arranged on the underside of the section of roof covering 10, which layer of adhesive material 11 extends over the entire surface or over most of the section of roof covering 10, in order to provide the necessary freedom for mounting the sections or strips of roof material.

Figure 7 shows a situation corresponding to Figure 6, in which the supporting plates 9 are replaced by a metal strip 12. This strip is preferably made of galvanized steel or of a strong aluminium compound. The strip 12 is connected to the substrate 7 of the roof by means of several screws 6, in which the screw heads are preferably recessed between the upright ridges of the strip, as shown in the drawing. In this embodiment, the seam between two adjacent sections of roof covering 10 coincides with the longitudinal direction of the strip. Each of the sections of roof covering 10 is connected to one of the strips of adhesive material 2. The effect explained with reference to Figure 3 is achieved by virtue of the fact that the strips of adhesive material are connected to the carrier section 1 at their edges. Although it is possible to reduce the size of the seam with respect to the situation shown in Figure 7, it is necessary to take measures to cover the seam. Figure 7 shows how a separate strip of roof covering 13 is applied, for example by gluing or fusing, although other methods of covering are not precluded.

Claims

1. Roof material which is to be applied to a flat roof and is designed to fix a section of roof covering which is to be applied to the roof, wherein the roof material is provided with a carrier which is to be attached to the roof, is provided with adhesive material on its top side and is connected to the adhesive material, **characterized in that** the adhesive material is applied to the carrier in the form of separate strips.

2. Roof material according to Claim 1, **characterized in that** the carrier is divided into separate carrier sections and that each carrier section is connected to at least one strip of adhesive material.

3. Section of roof material according to Claim 2, **characterized in that** the strip of adhesive material is connected to the carrier section only by means of a linear seam.

4. Section of roof material according to Claim 3, **characterized in that** the strip of adhesive material is provided with hooks, and **in that** the adhesive material present on the underside of the section of roof covering is adhesive material provided with loops.

5. Section of roof material according to Claim 3 or 4, **characterized in that** the linear seam is located at the edge of the strip of adhesive material.

6. Section of roof material according to Claim 3, 4 or 5, **characterized in that** the carrier section is in the form of a strip.

7. Section of roof material according to Claim 6, **characterized in that** a single strip of adhesive material is attached to the camier section, and **in that** the linear attachment seam is located approximately in the centre of the carrier section.

8. Section of roof material according to Claim 6, **characterized in that** two strips of adhesive material which extend parallel to one another are attached to the carrier section, and **in that** the linear attachment seam between the strips of adhesive material and the carrier section is located on the side of the strip facing the other strip of adhesive material.

9. Section of roof material according to Claim 8, **characterized in that** the carrier section extends beyond the attachment seam on at least one side.

10. Section of roof material according to one of the preceding claims, **characterized in that** the carrier section is connected to the substrate on both sides of the at least one attachment seam.

11. Section of roof material according to one of Claims 1-9, **characterized in that** the carrier section is connected to the substrate on the side of the at least one attachment seam facing away from the section of adhesive material.

12. Section of roof material according to Claim 8, **characterized in that** the carrier section is connected to the substrate between both attachment seams.

13. Section of roof material according to one of the preceding claims, **characterized in that** the carrier section is connected to the substrate by means of a screw connection.

14. Section of roof material according to Claim 13, **characterized in that** a separate plate is arranged under the head of each of the screws.

15. Section of roof material according to Claim 13, **characterized in that** a metal strip is arranged under the head of screws which are arranged between both attachment seams.

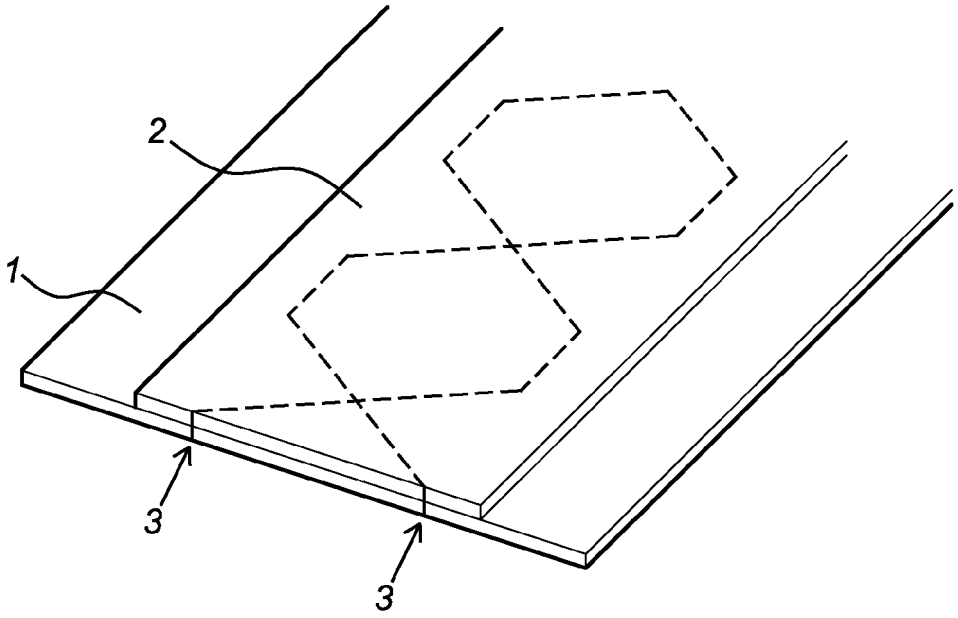

Fig. 1

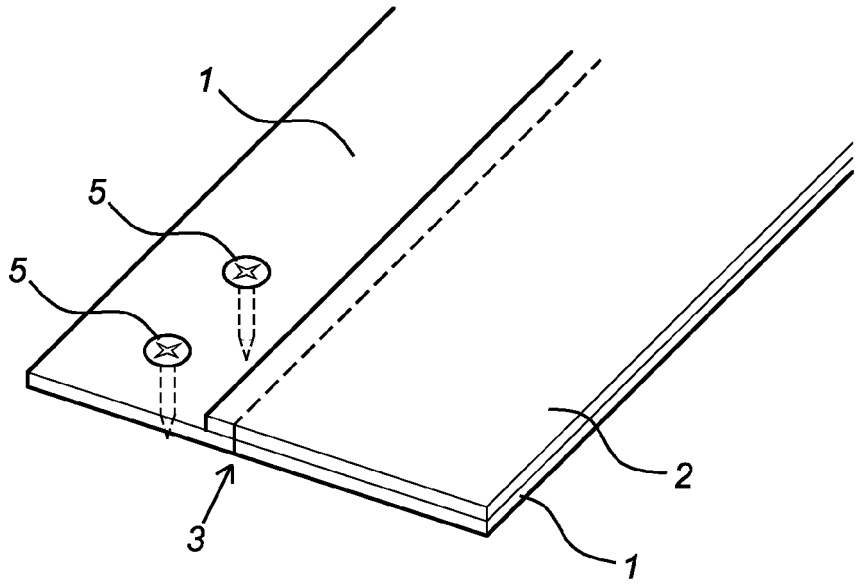

Fig. 2

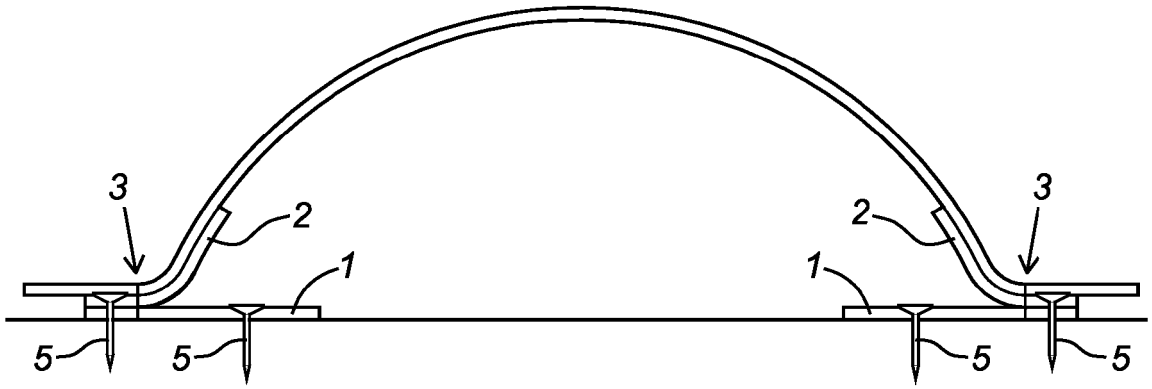

Fig. 3

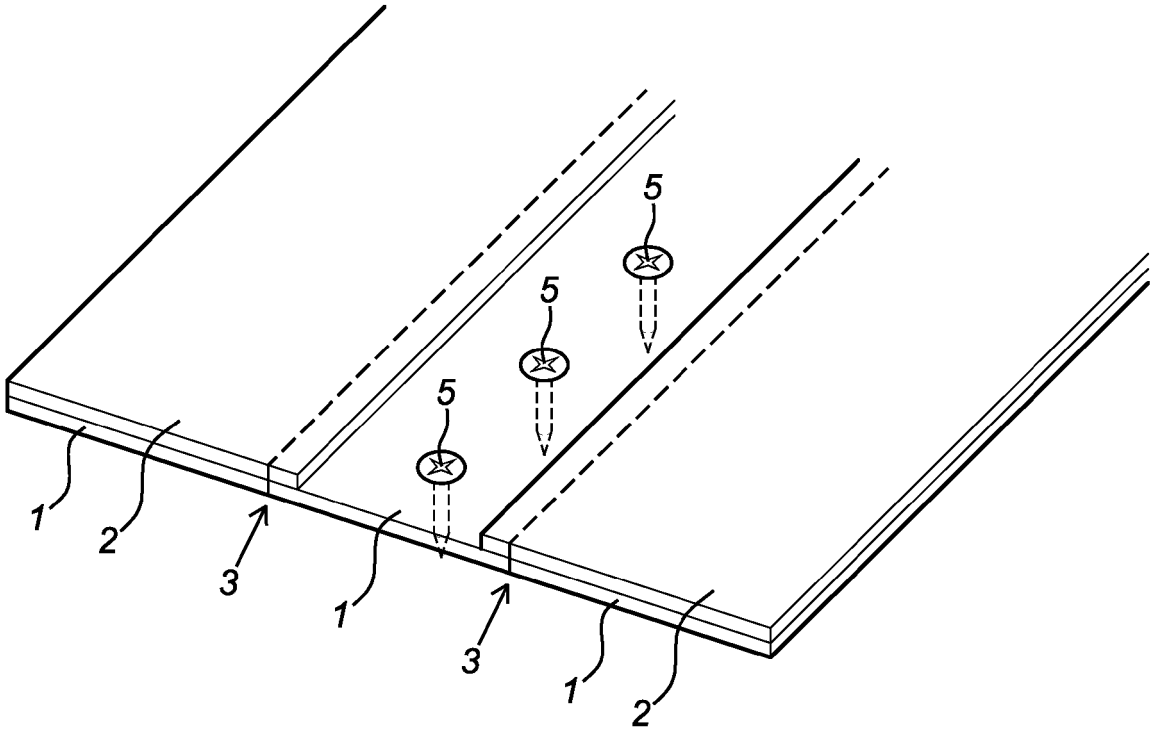

Fig. 4

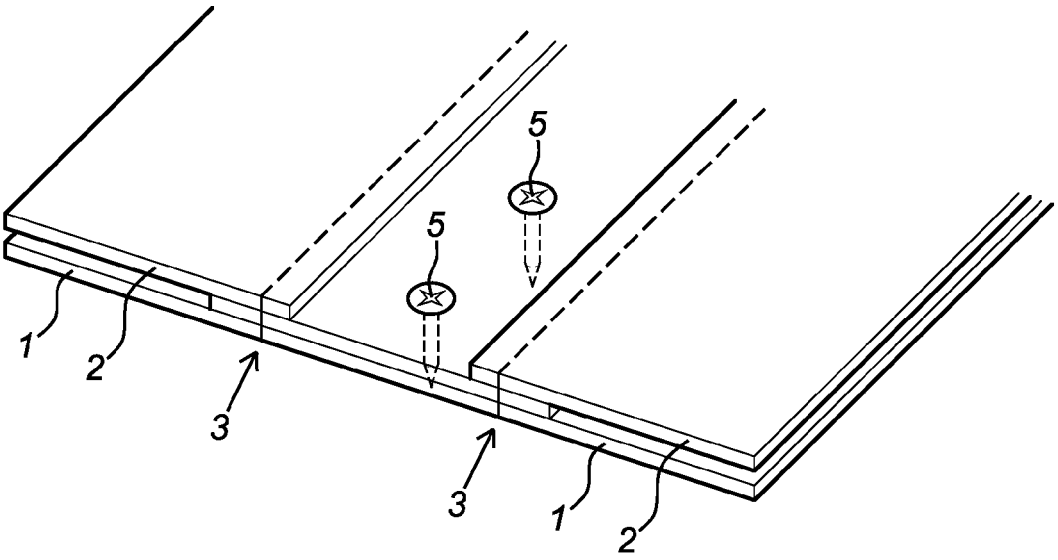

Fig. 5

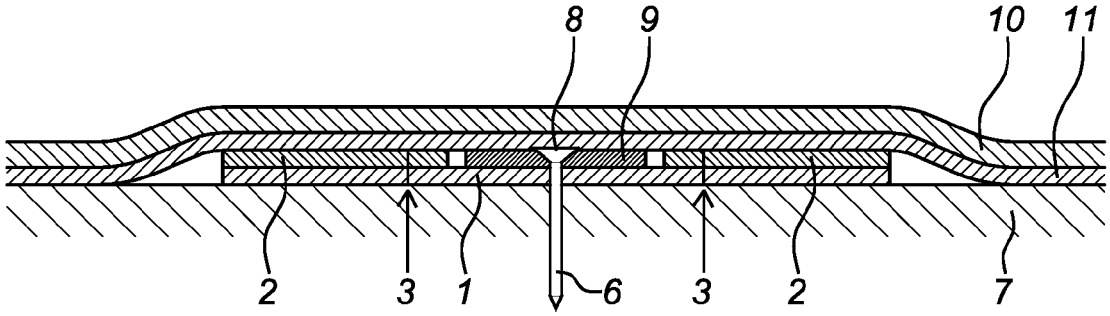

Fig. 6

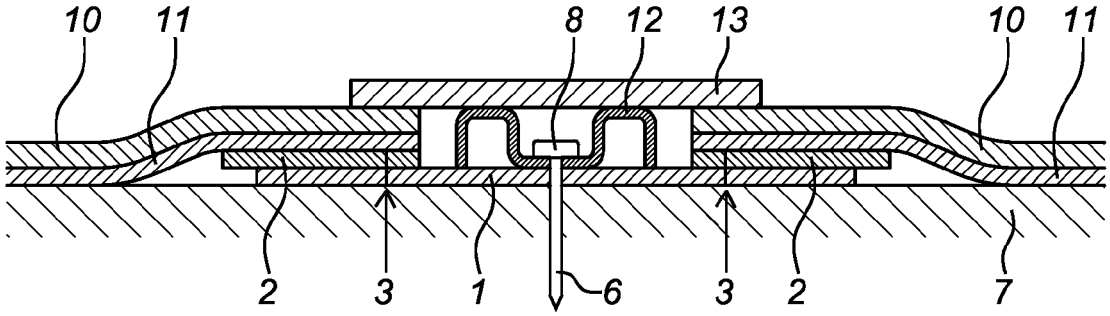

Fig. 7

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PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention. This report shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number
EP 15 15 3121

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2009/126768 A2 (VELCRO IND [NL]; KRAUS DAVID P JR [US]; SLOWIKOWSKI DERRICK [US]; TACH) 15 October 2009 (2009-10-15) * figures 15-17 *	1-6,8-13	INV. E04D5/14
X	US 4 712 348 A (TRIPLETT CHARLES S [US] ET AL) 15 December 1987 (1987-12-15) * figures *	1,2, 13-15	
X	US 2 241 058 A (LANIER EASON SIDNEY) 6 May 1941 (1941-05-06) * figure 4 *	1-3,5,6	
X,P	NL 2 010 923 C (L B BENEDICT HOLDING B V) 8 December 2014 (2014-12-08) * figure 3 *	1-4,6	
X	FR 2 938 567 A1 (LE BORGNE PHILIPPE [FR]; DUBOSC ARIANE [FR]) 21 May 2010 (2010-05-21) * figure 2 *	1,2	
	-/--		TECHNICAL FIELDS SEARCHED (IPC) E04D

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
The Hague	18 August 2015	Demeester, Jan

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

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EPO FORM 1503 03.82 (P04E07)

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PARTIAL EUROPEAN SEARCH REPORT

Application Number
EP 15 15 3121

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	US 2008/245399 A1 (DELIDDO JACK P [US]) 9 October 2008 (2008-10-09) * figure 6 *	1,2	
X	JP H04 343959 A (TAJIMA ROOFING CO; KURARAY CO) 30 November 1992 (1992-11-30) * figures *	1,2	
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INCOMPLETE SEARCH
SHEET C

Application Number
EP 15 15 3121

Claim(s) completely searchable:
1, 2, 4-6, 8-15

Claim(s) searched incompletely:
3

Claim(s) not searched:
7

Reason for the limitation of the search:

- Claim 7 defines the presence of a single strip, while claim 1 defines the presence of several strips. Due to this incompatibility, claim 7 has not been searched.
- For the same reason, the embodiments of figures 1, 2 and 3 have not been searched.
- Claim 3 refers to "the strip", while claim 1 defines several strips. Therefore, claim 3 has been searched under the supposition that the wording "the strip" is replaced by "said strips". This supposition applies also for all claims dependent on claim 3.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 15 3121

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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18-08-2015

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