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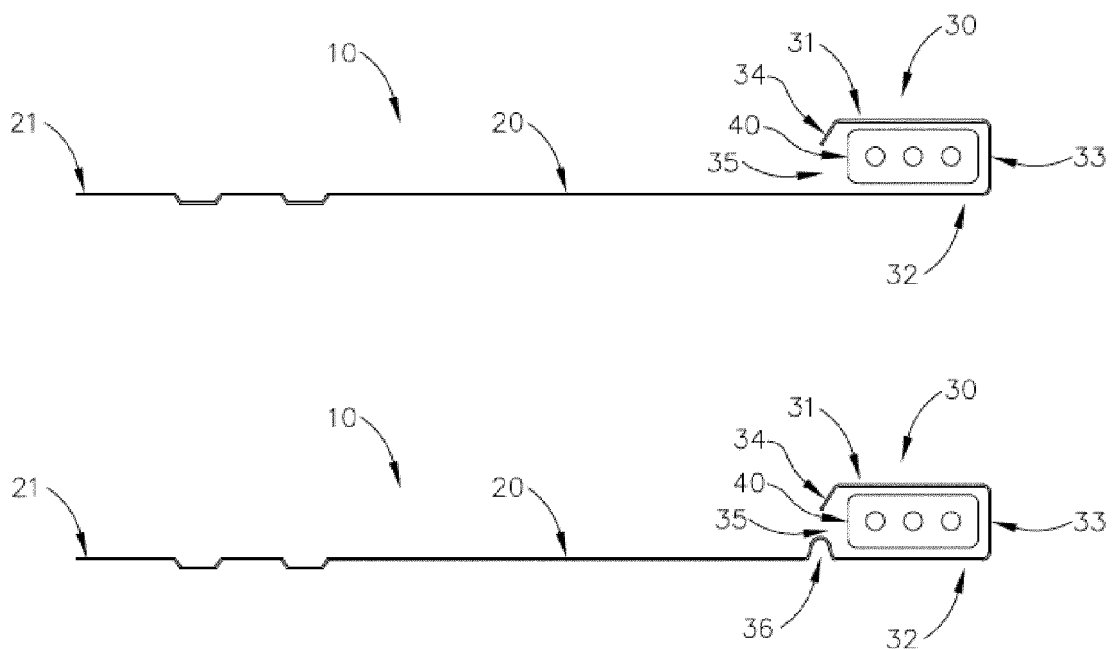
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(54) **Warming device**

(57) An elongated warming device may be used to prevent snow and ice buildup and accumulation on the roof or on steps. The device comprises a flat deck, a U-shaped bracket, and a self-regulating heat cable. The device is metal. The flat deck has two long ends and two faces, wherein the first long end is a free edge. The U-shaped bracket comprises two sides, a back, and a tab. The two sides and the back form a channel, where the

opening for the channel is between the ends of the two sides. The end of one side of the U-shaped bracket extends inwards towards the opening of the channel to form the tab, which holds the heat cable in the channel. The U-shaped bracket is attached to the second long end of the flat deck. The heat cable is in the channel of the U-shaped bracket.

Figure 1



Description

[0001] The present application hereby claims the benefit of the provisional patent application of the same title, Serial No. 61/806,060, filed on March 28, 2013, the disclosure of which is herein incorporated by reference in its entirety.

BACKGROUND

[0002] In cold climates it is common for ice dams to occur on a roof, causing water and ice to work up beneath shingles or other roofing material and allowing water to seep into the building. Snow may also build up in the valleys of a roof.

[0003] Snow and ice also collect on steps which can be particularly dangerous for pedestrians.

BRIEF SUMMARY

[0004] An elongated warming device may be used to prevent snow and ice buildup and accumulation on a roof or step. The device comprises a flat deck, a U-shaped bracket, and a self-regulating heat cable. The device is metal. The flat deck has two long ends and two faces, wherein the first long end is a free edge. The U-shaped bracket comprises two sides, a back, and a tab. The two sides and the back form a channel, where the opening for the channel is between the ends of the two sides. The end of one side of the U-shaped bracket extends inwards towards the opening of the channel to form the tab, which holds the heat cable in the channel. The U-shaped bracket is attached to the second long end of the flat deck. The heat cable is in the channel of the U-shaped bracket.

[0005] These and other objects and advantages shall be made apparent from the accompanying drawings and the description thereof.

[0006] According to the present invention, there is provided an elongated warming device comprising a flat deck, a U-shaped bracket, and a self-regulating heat cable; wherein the device is metal, wherein the flat deck has two long ends and two faces, wherein the first long end is a free edge, wherein the U-shaped bracket comprises two sides, a back, and a tab, where the two sides and the back form a channel, where the opening for the channel is between the ends of the two sides; the end of one side of the U-shaped bracket extends inwards towards the opening of the channel to form the tab, which holds the heat cable in the channel, the U-shaped bracket is attached to the second long end of the flat deck so that the opening of the channel is open towards the flat deck, wherein the heat cable is in the channel of the U-shaped bracket.

[0007] Preferably, the device is configured so that it may be installed under any row of shingles.

[0008] Alternatively, the device is configured so that it

may be installed in the valley of a roof.

[0009] Conveniently, the flat deck comprises holes close to the first long end, to allow fasteners to attach the flat deck to the roof.

[0010] Preferably, the angle between the flat deck and the side of the U-shaped bracket attached to the flat deck is about 135° or more, preferably wherein one side of the U-shaped bracket is co-planar with the flat deck.

[0011] Advantageously, the angle between the flat deck and the side of the U-shaped bracket attached to the flat deck is about 90°.

[0012] Preferably, the side of the U-shaped bracket opposite to the tab has an elongated bump.

[0013] Conveniently, at least one face of the flat deck has a rough surface texture.

[0014] Advantageously, the device is configured so it may be installed on a step.

[0015] Preferably, the first long end of the flat deck is bent at approximately 90 degrees to the flat deck so the first long end extends toward the face of the flat deck that is opposite to that of the U-shaped bracket.

[0016] The present invention also provides a method for melting ice or snow from a roof comprising the steps of:

installing an elongated warming device on a roof, and sending electricity to a heat cable in the elongated warming device;

wherein the elongated warming device comprising a flat deck, a U-shaped bracket, and the heat cable; wherein the device is metal,

wherein the flat deck has two long ends and two faces, wherein the first long end is a free edge, wherein the U-shaped bracket comprises two sides, a back, and a tab, where the two sides and the back form a channel, where the opening for the channel is between the ends of the two sides; the end of one side of the U-shaped bracket extends inwards towards the opening of the channel to form the tab, which holds the heat cable in the channel, the U-shaped bracket is attached to the second long end of the flat deck so that the opening of the channel is open towards the flat deck, wherein the heat cable is in the channel of the U-shaped bracket.

[0017] Conveniently, the flat deck is installed under a row of shingles.

[0018] Alternatively, the device is installed in the valley of a roof.

[0019] Conveniently, one side of the U-shaped bracket is co-planar with the flat deck.

[0020] Advantageously, the side of the U-shaped bracket opposite to the tab has an elongated bump.

BRIEF DESCRIPTION OF THE FIGURES

[0021] The accompanying drawings, which are incorporated in and constitute a part of this specification, il-

illustrate embodiments, and together with the general description given above, and the detailed description of the embodiments given below, serve to explain the principles of the present disclosure.

FIGURE 1 is a cross-section view of two embodiments of a warming device.

FIGURE 2 is a photograph of a warming device installed on a roof.

FIGURE 3 is a perspective view of two warming devices installed in the valley of a roof.

FIGURE 4 is a photograph of a warming device installed on a roof.

FIGURE 5 is a photograph of a warming device installed on a roof.

FIGURE 6 is a perspective view of two embodiments of a warming device installed on steps.

DETAILED DESCRIPTION

[0022] An elongated warming device (10), shown in figures 1-6, may be used to prevent snow and ice buildup and accumulation on the roof or on steps. The device (10) comprises a flat deck (20), a U-shaped bracket (30), and a self-regulating heat cable (40). The device is metal. The flat deck (20) has two long ends and two faces, wherein the first long end is a free edge (21). The U-shaped bracket (30) comprises two sides (31, 32), a back (33), and a tab (34). The two sides (31, 32) and the back (33) form a channel (35), where the opening for the channel (35) is between the ends of the two sides (31, 32). The end of one side (31 or 32) of the U-shaped bracket (30) extends inwards towards the opening of the channel (35) to form the tab (34), which holds the heat cable (40) in the channel (35). The U-shaped bracket (30) is attached to the second long end of the flat deck (20) so that the opening of the channel is open towards the flat deck. The heat cable (40) is in the channel (35) of the U-shaped bracket (30).

[0023] In one embodiment, the device (10) is configured so that it may be installed under any row of shingles. For example, the device (10) may be installed at the bottom row of shingles right above the gutter or gutter cover as shown in Figure 2. The device (10) may be installed under the second row of shingles, or the third row, as shown in Figures 4 and 5. The device (10) may be installed under any row of shingles up to the top of the roof. Multiple warming devices (10) may be installed under several rows of shingles. The width of the flat deck (20) may vary depending on the application. In some embodiments the width may be from about 6 inches to about 8 inches.

[0024] In some embodiments, the device (10) is con-

figured so that one or more devices may be installed in the valley of a roof. The device (10) may be installed so that the wire is near the center of the valley or near the shingles, as shown in Figure 3. The flat deck (20) may be placed under or above the shingles. The device (10) may be installed in the valley of a roof so the self-regulating heat cable (40) is facing the shingles, or facing away from the shingles.

[0025] In some embodiments, the flat deck (20) comprises holes, close to the first long end (21), to allow fasteners to attach the flat deck (20) to the roof. These holes will allow fasteners, such as screws or nails to be used to fasten the device (10) to the roof. The area around the holes may be debossed to allow space for the screw head or nail head.

[0026] The U-shaped bracket (30) creates the channel (35) for the heat cable (40) to fit into. It is installed through the opening of the channel (35). One side of the U-shaped bracket (30) has a tab (34) to prevent the heat cable (40) from slipping out of the channel (35). In some embodiments, the side of the U-shaped bracket (30) opposite to the tab (34) has an elongated bump (36). With both a tab (34) and an elongated bump (36) the heat cable (40) should be more secure in the channel (35). In some embodiments, the tab (34) is formed from the bend that connects the U-shaped bracket (30) to the flat deck (20).

[0027] In some embodiments, one side (31 or 32) of the U-shaped bracket (30) is co-planar with the flat deck (20). In some embodiments, the side of the U-shaped bracket (30) that is coplanar is side (31), in some embodiments it is side (32). In some embodiments, a bend connects the second long end of the flat deck (20) to one side (31) of the U-shaped bracket (30). In some embodiments, the angle between the flat deck (20) and the side (31) of the U-shaped bracket (30) attached to the flat deck (20) is about 90° or more, such as about 135° or more. In some embodiments, one side of the U-shaped bracket (30) is co-planar with the flat deck (20). In some embodiments, the angle between the flat deck (20) and the side (31) of the U-shaped bracket (30) attached to the flat deck (20) is greater than 180° so that the opening of the channel (35) is partially closed off by the deck (20).

[0028] The elongated warming device (10) may also be used to prevent snow and ice buildup and accumulation on steps. In some embodiments, the device (10) is configured so it may be installed on a step, as shown in Figure 6. The width and length of the device (10) must be appropriate to fit on a step. There may be a warming device (10) placed on one or more steps in a stairway. In some embodiments, at least one face of the flat deck (20) has a rough surface texture to prevent slipping. In some embodiments, the face of the flat deck (20) has upward embossments. In some embodiments, the device (10) is made from heavy duty aluminum.

[0029] The U-shaped bracket (30) may be attached to the flat deck (20) in several ways when used the device (10) is used on a step, as shown in Figure 6. In some embodiments, one side of the U-shaped bracket (30) is

co-planar with the flat deck (20). In some embodiments, the first long end (21) of the flat deck (20) is bent at approximately 90 degrees to the flat deck (20) so the first long end (21) extends toward the face of the flat deck (20) that is opposite to that of the U-shaped bracket (30). In some embodiments, a bend connects the second long end of the flat deck (20) to one side (31) of the U-shaped bracket (30) so the flat deck (20) and the side (31) of the U-shaped bracket (30) are at approximately 90 degrees.

[0030] The heat cable (40) heats the warming device (10) to melt ice or snow. The heat cable (40) may be able to increase the temperature of part of a roof or step so it is warm enough to melt ice or snow. In one embodiment the heat cable (40) is a low temperature self-regulating cable, such as the CHROMALOX brand self-regulating low temperature heating cable, available from CHROMALOX Precision Heat and Control, or the equivalent. It is capable of being directly connected to typical household electric service. It is self regulating so that when the ambient temperature is higher less heat is produced, and when the ambient temperature is lower more heat is produced. It may be jacketed to protect it from exposure to water and the environment. The heat cable (40) can provide enough heat at cold temperatures to melt ice and snow.

[0031] The heat cable (40) is attached to an electrical source. The heat cable (40) may be run inside the downspout then out an opening near the bottom of the downspout to connect to an outlet or hardwired into a circuit. The opening in the downspout may be sealed around the cable to prevent rainwater from leaking out. In another embodiment the heat cable (40) may be run into the attic, and connected to an outlet or hardwired into a circuit through the attic.

[0032] In another embodiment the heat cable (40) is controlled by a switch or a temperature measuring device (10). A switch may be used to manually turn on and off the heat cable (40). A temperature measuring device (10) may be used to turn on the heat cable (40) when the temperature is below a set temperature.

[0033] While the present disclosure has illustrated by description several embodiments and while the illustrative embodiments have been described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications may readily appear to those skilled in the art.

[0034] When used in this specification and claims, the terms "comprises" and "comprising" and variations thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.

[0035] The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such fea-

tures, be utilised for realising the invention in diverse forms thereof.

5 Claims

1. An elongated warming device comprising a flat deck, a U-shaped bracket, and a self-regulating heat cable; wherein the device is metal,

wherein the flat deck has two long ends and two faces, wherein the first long end is a free edge, wherein the U-shaped bracket comprises two sides, a back, and a tab, where the two sides and the back form a channel, where the opening for the channel is between the ends of the two sides; the end of one side of the U-shaped bracket extends inwards towards the opening of the channel to form the tab, which holds the heat cable in the channel,

the U-shaped bracket is attached to the second long end of the flat deck so that the opening of the channel is open towards the flat deck, wherein the heat cable is in the channel of the U-shaped bracket.

2. The device of claim 1, wherein the device is configured so that it may be installed under any row of shingles.
3. The device of claim 1, wherein the device is configured so that it may be installed in the valley of a roof.
4. The device of any one of claims 1 to 3, wherein the flat deck comprises holes close to the first long end, to allow fasteners to attach the flat deck to the roof.
5. The device of any one of claims 1 to 4, wherein the angle between the flat deck and the side of the U-shaped bracket attached to the flat deck is about 135° or more, preferably wherein one side of the U-shaped bracket is co-planar with the flat deck.
6. The device of any one of claims 1 to 4, wherein the angle between the flat deck and the side of the U-shaped bracket attached to the flat deck is about 90°.
7. The device of any one of claims 1 to 6, wherein the side of the U-shaped bracket opposite to the tab has an elongated bump.
8. The device of any one of claims 1 to 7, wherein at least one face of the flat deck has a rough surface texture.
9. The device of any one of claims 1 to 8, wherein the device is configured so it may be installed on a step.

10. The device of any one of claims 1 to 9, wherein the first long end of the flat deck is bent at approximately 90 degrees to the flat deck so the first long end extends toward the face of the flat deck that is opposite to that of the U-shaped bracket. 5
11. A method for melting ice or snow from a roof comprising the steps of:
- installing an elongated warming device on a roof, and 10
- sending electricity to a heat cable in the elongated warming device;
- wherein the elongated warming device comprising a flat deck, a U-shaped bracket, and the heat cable; wherein the device is metal, 15
- wherein the flat deck has two long ends and two faces, wherein the first long end is a free edge, wherein the U-shaped bracket comprises two sides, a back, and a tab, where the two sides and the back form a channel, where the opening for the channel is between the ends of the two sides; the end of one side of the U-shaped bracket extends inwards towards the opening of the channel to form the tab, which holds the heat cable in the channel, 20 25
- the U-shaped bracket is attached to the second long end of the flat deck so that the opening of the channel is open towards the flat deck, wherein the heat cable is in the channel of the U-shaped bracket. 30
12. The method of claim 11, wherein the flat deck is installed under a row of shingles. 35
13. The method of claim 11, wherein the device is installed in the valley of a roof.
14. The method of any one of claims 11 to 13, wherein one side of the U-shaped bracket is co-planar with the flat deck. 40
15. The method of any one of claims 11 to 14, wherein the side of the U-shaped bracket opposite to the tab has an elongated bump. 45

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Figure 1

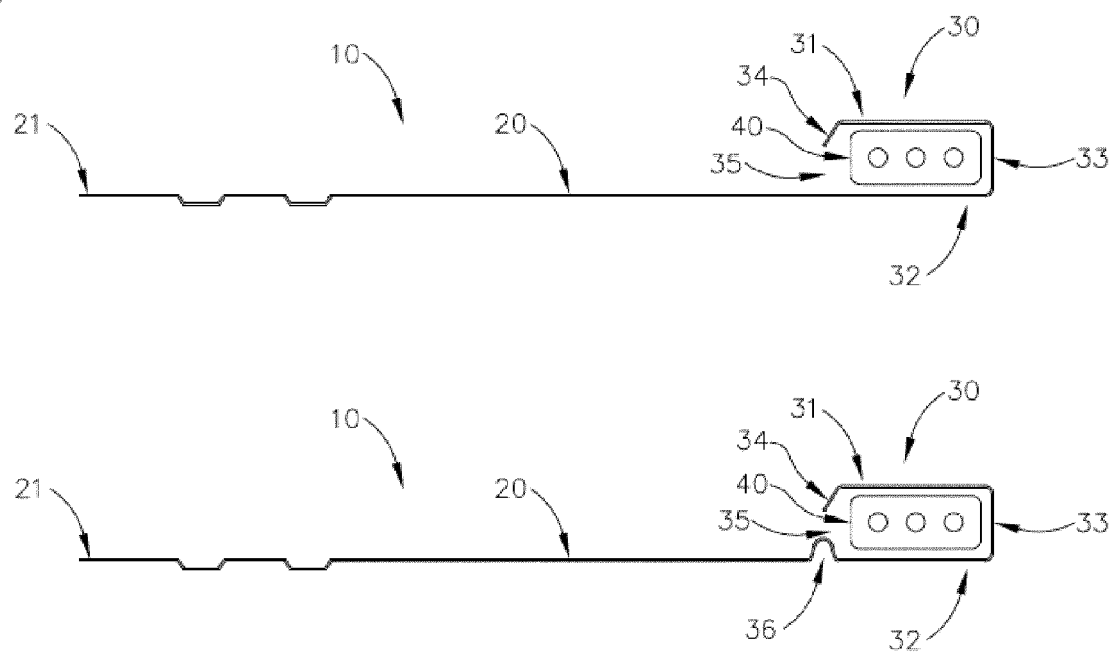


Figure 2

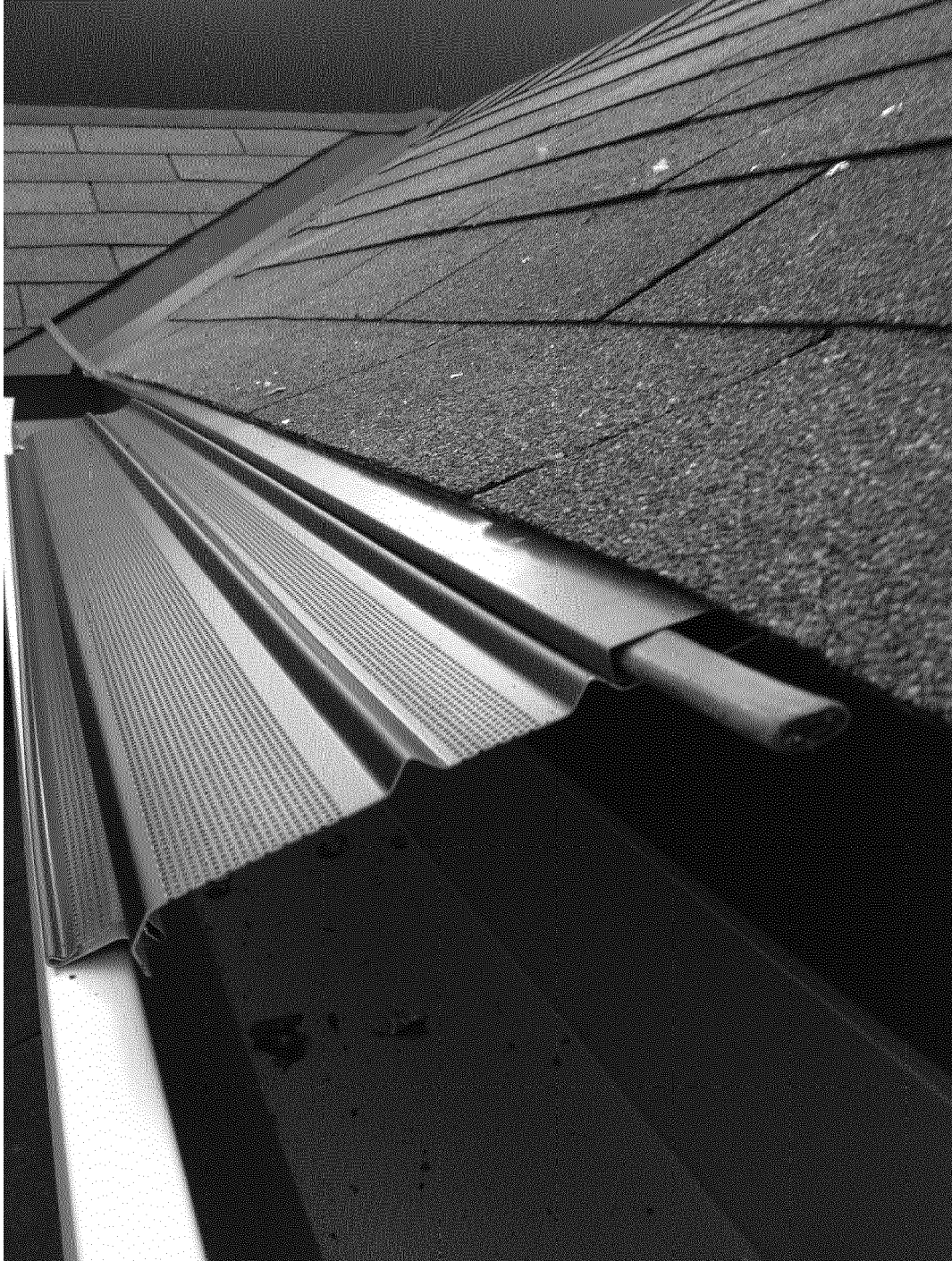


Figure 3

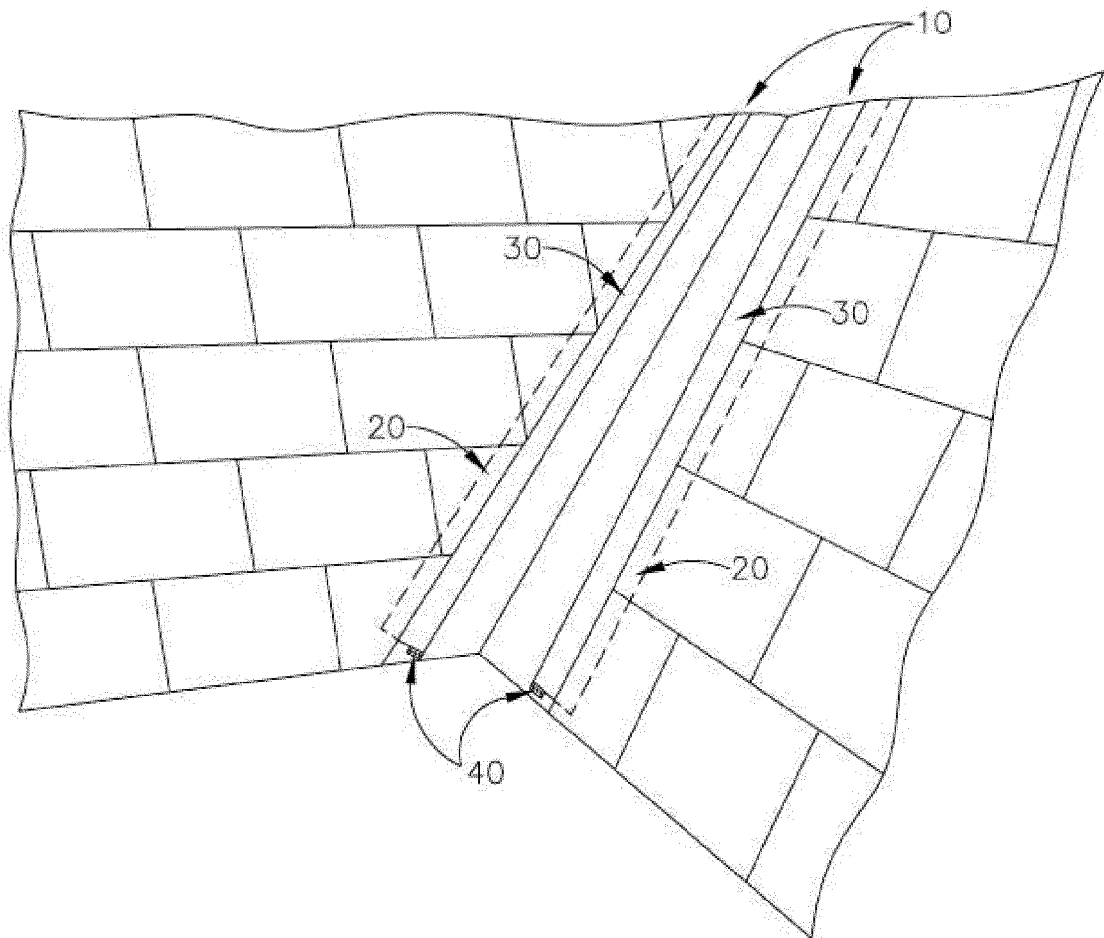


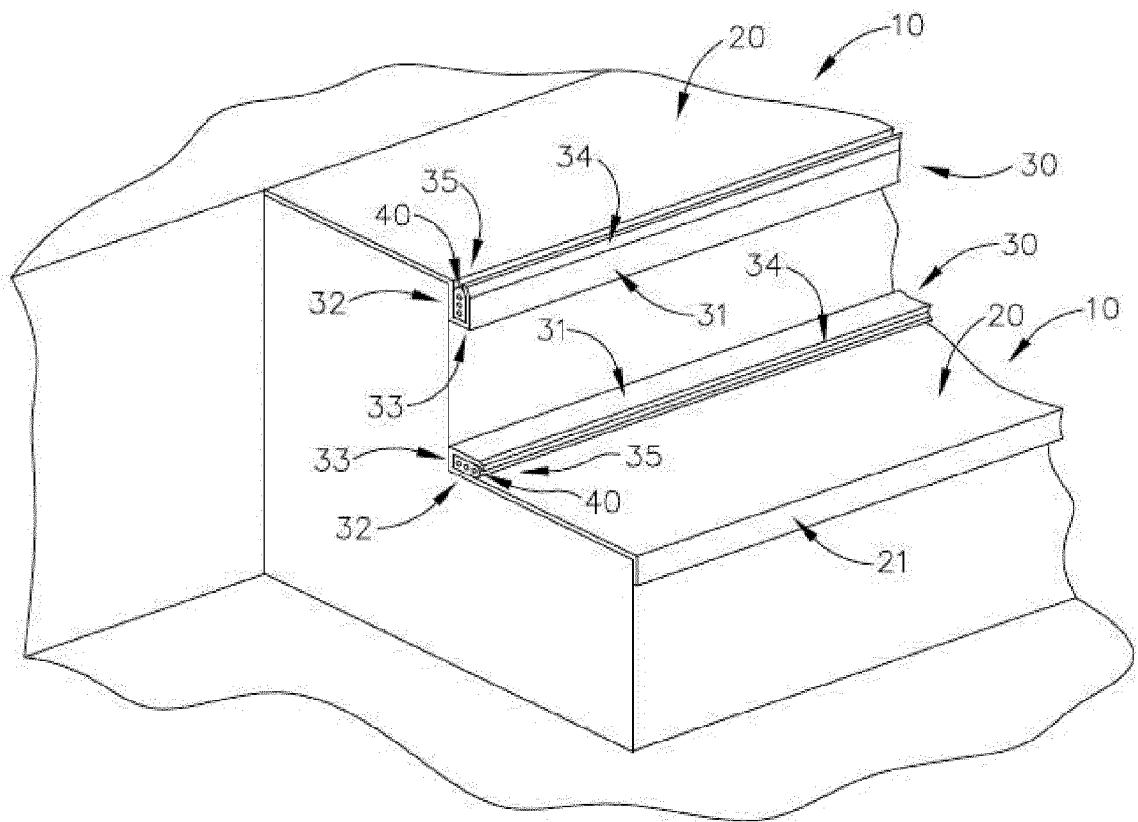
Figure 4



Figure 5



Figure 6





EUROPEAN SEARCH REPORT

Application Number
EP 14 16 2247

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	US 2011/047927 A1 (NARK MALCOLM BRENT [US] ET AL) 3 March 2011 (2011-03-03) * figures 2,8N-0 * * paragraphs [0002], [0052], [0061], [0070] * -----	1-15	INV. E04D13/076 E04D13/10 E01C11/26
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D E01C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 July 2014	Examiner Tran, Kim Lien
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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