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(54) **FALL PROTECTION INSTALLATION**

RETTUNGSLEINE

INSTALLATION ANTI-CHUTE

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(73) Proprietor: **Comforthome B.V.**
3401 NS IJsselsteijn (NL)

(72) Inventor: **BORRA, Hans, Antonius**
NL-3707 TB Zeist (NL)

(74) Representative: **Nederlandsch Octrooibureau**
P.O. Box 29720
2502 LS The Hague (NL)

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Description

[0001] The present invention relates to a fall protection installation for a according to the preamble of claim 1. A fall protection installation is disclosed in GB 2 330 169. This publication discloses a construction consisting of four feet that are joined to one another via strips. The strips cross one another and an point of engagement for a lifeline or the like is made at the cross-over point. The weight of the feet is achieved by stacking a number of plates on top of one another. These plates are provided with handles for easy transport thereof.

[0002] If there is any loading on the engagement point this tips. Such a fall protection installation can then no longer be used and in any event the strips have to be replaced.

[0003] Such a fall protection installation is complex to construct. After all, each of the feet must be built up individually and accurately positioned. Moreover, such a fall protection installation must be removed from the roof after the work has been carried out.

[0004] DE 41 24 147 A1 discloses a construction by means of which a safety installation for the edge of a roof can be realised. This consists of a concrete block that is provided at the top with a fastening for a wire rope that is fixed to the temporary safety installation for the edge of a roof. This concrete block is provided with handles to enable it to be installed and removed easily. DE 41 24 147 A1 discloses the features of the preambles of claim 1 and claim 6. CA 2 266 943 discloses a construction for the temporary installation of a traffic sign or the like. This consists of a concrete block that is provided with rubber feet. A protruding part for fixing a post or the like thereto is fitted on the top of this concrete block.

[0005] National/international authorities are imposing increasingly more stringent requirements in respect of the safety of people who work on rooves. If people are working on a flat roof a distance of less than 4 m away from the edge of the roof, wearing of a lifeline and securing of said lifeline to a fixed point on the roof is obligatory. In the state of the art a wide variety of constructions have been conceived to make this possible. Frequently these are temporary constructions that for use have to be constructed and dismantled again each time. Other constructions involve protruding posts and the like, with which there is a risk of tripping when walking over the roof and water leaks frequently occur. Yet other constructions require regular maintenance.

[0006] It is the aim of the present invention to provide a (semi)permanent safety installation for a roof that can be fitted in a simple manner, requires no maintenance and does not constitute an obstacle to people who are working on the roof. Moreover, it must be possible for securing of the person concerned to be carried out relatively easily, so that there is hardly any barrier to using a lifeline or the like. The roof construction must also as far as possible remain unchanged and no breaks must be made in the roof covering.

[0007] This aim is realised with a fall protection installation according to claim 1.

[0008] It has been found that it is already possible to provide a fall protection installation using a single tile of relatively high weight. Experiments have shown that when a weight of 100 kg falls from a roof in accordance with test EN 795 a weight of 150 kg for the tile is already adequate to provide safety. It is true that such a tile will possibly undergo some movement in the case of a substantial impact resulting from the falling motion, but this movement is not such that the fall protection installation fails. According to the present invention such a tile can be incorporated in a path that, for example, has been made on a roof. For this purpose the dimensions of the tile can correspond to conventional tile dimensions, for example 90 x 90 cm. The material is preferably concrete-like material. The feet are present to enable water to pass underneath the tile and to increase the grip. Moreover, it has been found that if the feet consist of a rubbery material, on the one hand more grip is created between the feet and the roof covering and, on the other hand, damping of the tug that occurs in the event of any fall takes place. According to the invention it is important that the point of engagement for a lifeline or the like is made at a low level. After all, tipping of the concrete body must be prevented. In constructions where the point of engagement is on top of the concrete body, it cannot be guaranteed that tipping does not takes place under adverse circumstances. Consequently there is an appreciable risk and the fall protection installation becomes a danger for the environment.

[0009] Preferably, the point of engagement for a lifeline or the like is provided approximately halfway up the height of the actual concrete body.

[0010] As a result of the presence of the feet it is guaranteed that water can always flow over the roof virtually unimpeded. Moreover, as a result the specific pressure at the location of the foot on the roof is increased, which increases the grip on the roof. This grip is even further promoted by providing the foot with an adhesive layer. Such an adhesive layer can be chosen depending on the roof covering concerned. For instance, it is possible to use various types of double-sided adhesive tape which on one side adhere to the underside of the foot and on the other side to the roof covering. A specific type of adhesive tape is chosen depending on the roof covering. Such an adhesive layer can also be a bituminous material that becomes tacky on heating slightly. However, it will be understood that other mechanisms for adhesion can be used depending on the type of roof covering (EPDM, PVC, bituminous and the like).

[0011] The fastening for attaching a lifeline can comprise any construction known in the state of the art. However, for this purpose it is preferred to use a bracket that has been cast into the concrete material of the tile. A cut-out is provided in the tile for installing the bracket. That is to say, the external dimension of the tile remains unchanged, whilst at the side there is an easily accessible

bracket for securing a lifeline, wire rope and the like thereto. Such a bracket can also be used as a lifting facility when installing the fall protection installation according to the present invention on a roof. Facilities such as uprights and corner traversing bars can be fitted in this cut-out.

[0012] According to a further advantageous embodiment at least one of the edges of the tile-like body is provided with chamfering, as a result of which tripping is further prevented.

[0013] With regard to the feet, extensive tests have shown that if the feet, and thus the tile, are stuck to the roof even better characteristics can be obtained and the requirements currently in force are complied with easily. In such a case, in the event of the sudden occurrence of a fall load of approximately 100 kg after a free fall of approximately 2.5 m no movement of the tile whatsoever will take place.

[0014] The invention also relates to a method for installing a fall protection installation on a flat roof according to claim 6. In view of the weight, installation of the tile-like body on the roof must be carried out using a crane. The fall protection installation according to the present invention can be installed on the roof either permanently or temporarily. After all, because of the construction thereof no maintenance is necessary.

[0015] The invention will be explained in more detail below with reference to an illustrative embodiment shown in the drawings. In the drawings:

Fig. 1 shows, diagrammatically, a plan view of an embodiment of the fall protection installation according to the invention;
Fig. 2 shows a construction according to Fig. 1 viewed from below;
Fig. 3 shows the use of the fall protection installation according to the present invention on a roof,
Fig. 4 shows one embodiment of a corner protection installation,
Fig. 5 shows the installation of a further fall protection installation in combination with the tiles according to the invention;
Fig. 6 shows a variant thereof.

[0016] In Fig. 1 the fall protection installation according to the present invention is indicated in its entirety by 1. This consists of a tile-like body made of concrete material with a weight of more than 150 kg, preferably 190 kg. This is indicated by 6. This concrete material can be a non-reinforced or reinforced concrete material. The tile-like body 6 is preferably made square or rectangular, for example with a size of 90 x 90 cm. This body is provided with step-up chamfering 5 close to the end edges. The tile is provided with cut-outs 2, which are bridged by brackets 3. These brackets 3 are also cast-in and can be made of steel material, in particular stainless steel. The brackets 3 can be constructed as a continuous ring, as a result of which optimum anchoring in the concrete material is achieved. As a result of the use of high grade materials there is no need for any maintenance on the tile. The brackets 3 are cast in below the highest point of the concrete body (in the use position). More particularly, as can be seen from the drawing, these are installed approximately halfway up the height of the concrete body 6.

[0017] It can be seen from Fig. 2 that the underside of the tile-like body is provided with feet 4. These consist of a rubbery material. These feet are provided at the free end with an adhesive layer that provides an adhesive joint with the roof covering. The shape of the feet can be any conceivable shape. Preferably, there will be at least two feet, but it is also possible to mount three or four feet.

[0018] As a result of installing bracket 3 at a low level, no tipping moment will be exerted on the concrete part 6 when a tensile force is exerted on part 3 and at worst shifting can occur. In view of the high weight and the use of rubbery material for the feet, optionally in combination with sticking firmly to the roof covering, such a linear movement is not or hardly to be anticipated.

[0019] The height of the construction shown here can be relatively restricted. An effective height of the feet of approximately 2 cm is mentioned as an example. As a result the water can run freely past the feet. According to a particularly advantageous embodiment, the height of the tile-like body 6 is approximately 10 cm and, as indicated above, the bracket 3 will preferably be installed approximately in the middle, that is to say approximately 5 cm from the top.

[0020] A roof indicated in its entirety by 8 is shown in Fig. 3. A path 9 has been laid on said roof. This path consists of conventional tiles 10 and the fall protection installation 1 according to the present invention. The roof covering is indicated by 11. According to an advantageous embodiment of the invention, the feet of tiles 1 are stuck to the roof covering with the aid of glue. It can be seen from Figure 3 that there is also a corner tile 1. This is shown in detail in Fig. 4.

[0021] By arranging a series of fall protection installations according to the present invention in combination with conventional tiles close to the edge of the roof, a clear boundary is indicated to people working on the roof. Inside the tiles it is safe to work on the roof and outside them the use of lifelines is necessary (4 metre zone).

[0022] A variant of the invention in which uprights 13 are fitted in the cut-outs 2 and interacting with the brackets 3 is shown in Fig. 5. A railing produced from wire ropes 14 or other components can be fitted thereto. By this means, for example, the 2 metre zone from the edge of the roof can be protected. In this way harnesses are not necessary within this region either.

[0023] A variant in which uprights 23 are also present, which, however, have been made shorter, is shown in Fig. 6. There is a wire rope 21 fastened to these uprights, by means of which it is possible to gain access to the entire roof without uncoupling. By this means it is possible to walk safely on corners of buildings without uncoupling/coupling up.

[0024] It is possible not only to fit fastenings for fall protection equipment for people to the bracket 3, but also ladders and the like to protect against falling over.

[0025] These and further variants of the invention fall within the scope of the present application.

[0026] After the above, variants that fall within the scope of appended claims will be immediately apparent to those skilled in the art.

Claims

1. Fall protection installation (1) for a roof (8), comprising a tile-like body (6) provided with feet (4) for leaving a gap underneath said body, as well as a fastening for a harness (3), whereby said fastening for a harness is provided below the point of said fall protection installation that is highest in use, **characterised in that** the fall protection installation comprises a single block-shaped body with a minimum weight of 150 kg, and wherein said feet are made of a rubbery material, and wherein said feet are additionally provided with an adhesive layer that can be stuck to roof covering.

2. Fall protection installation according to one of the preceding claims, wherein said fastening for a harness comprises a cut-out (2) in said tile-like body (6), which is bridged close to the free end thereof by a steel component (3) cast into said concrete.

3. Fall protection installation according to one of the preceding claims, wherein said tile has a surface area of at least 0.7 m^2.

4. Fall protection installation according to one of the preceding claims, having edges (5) chamfered towards the top.

5. Building with flat roof provided with a roof covering (11) and a path (9), **characterised in that** said path contains a fall protection installation according to one of the preceding claims.

6. Method for installing a fall protection installation on a flat roof, comprising the provision of a tile-like body (6) made of concrete material provided with feet (4) to leave a gap underneath said body, **characterised in that** said tile-like body has a minimum weight of 150 kg, wherein said tile-like body is placed on the roof using a crane and the feet, made of a rubbery material and additionally provided with an adhesive layer, are stuck to the covering of said flat roof.

7. Method according to Claim 6, wherein said fall protection installation remains on said roof after work has been carried out on said roof.

Patentansprüche

1. Fallschutzanlage (1) für ein Dach (8), aufweisend einen fliesenartigen Körper (6), der über Füße (4) verfügt, so dass ein Spalt unterhalb des Körpers verbleibt, und eine Befestigung für ein Geschirr (3), wobei die Befestigung für ein Geschirr unterhalb des im Gebrauch der Fallschutzanlage höchsten Punktes der Fallschutzanlage liegt,
dadurch gekennzeichnet, dass die Fallschutzanlage einen einzelnen blockförmigen Körper mit einem Mindestgewicht von 150kg umfasst, und wobei die Füße aus einem gummiartigen Material bestehen, und wobei die Füße zusätzlich mit einer Haftschicht versehen sind, die an der Bedachung angeheftet werden kann.

2. Fallschutzanlage nach einem der vorhergehenden Ansprüche, wobei die Befestigung für ein Geschirr einen Ausschnitt (2) in dem fliesenartigen Körper (6) aufweist, der nahe an dessen freien Ende durch ein Stahlbauteil (3), das in den Beton eingegossen ist, überbrückt ist.

3. Fallschutzanlage nach einem der vorhergehenden Ansprüche, wobei die Fliese eine Oberfläche von mindestens 0,7 m^2 aufweist.

4. Fallschutzanlage nach einem der vorhergehenden Ansprüche, mit nach oben abgeschrägten Rändern (5).

5. Gebäude mit einem Flachdach, das mit einer Dachabdeckung (11) und einem Pfad (9) versehen ist, **dadurch gekennzeichnet, dass** der Pfad (9) eine Fallschutzanlage nach einem der vorhergehenden Ansprüche beinhaltet.

6. Verfahren zum Anbringen einer Fallschutzanlage auf einem Flachdach, wobei das Verfahren das Bereitstellen eines fliesenartigen Körpers (6) aus Betonmaterial umfasst, wobei der fliesenartige Körper (6) mit Füßen (4) versehen ist, so dass ein Spalt unterhalb des Körpers verbleibt, **dadurch gekennzeichnet, dass** der fliesenartige Körper ein Mindestgewicht von 150 kg aufweist, wobei der fliesenartige Körper mittels eines Krans auf dem Dach platziert wird und die Füße, die aus einem gummiartigen Material hergestellt und zusätzlich mit einer Haftschicht versehen sind, auf der Abdeckung des Flachdaches angeheftet werden.

7. Verfahren nach Anspruch 6, wobei die Fallschutzanlage auf dem Dach verbleibt, nach dem Arbeiten auf dem Dach ausgeführt worden sind.

Revendications

1. Installation anti-chute (1) pour un toit (8), comprenant un corps en forme de tuile (6) pourvu de pieds (4) pour laisser un espace au-dessous dudit corps, ainsi qu'un élément de fixation pour un harnais (3), moyennant quoi ledit élément de fixation pour un harnais est prévu au-dessous du point de ladite installation anti-chute qui est le plus haut en utilisation, **caractérisée en ce que** l'installation anti-chute comprend un corps en forme de bloc unique avec un poids minimum de 150 kg, et dans laquelle lesdits pieds sont constitués d'un matériau caoutchouteux, et dans laquelle lesdits pieds sont de plus pourvus d'une couche adhésive qui peut être collée à la couverture de toit.

2. Installation anti-chute selon la revendication précédente, dans laquelle ledit élément de fixation pour un harnais comprend une découpe (2) dans ledit corps en forme de tuile (6), qui est enjambée à proximité de l'extrémité libre de celle-ci par un composant en acier (3) coulé dans ledit béton.

3. Installation anti-chute selon l'une des revendications précédentes, dans laquelle ladite tuile a une superficie d'au moins 0,7 m^2.

4. Installation anti-chute selon l'une des revendications précédentes, comportant des bords (5) chanfreinés vers le haut.

5. Bâtiment avec un toit plat pourvu d'une couverture de toit (11) et d'un chemin (9), **caractérisé en ce que** ledit chemin contient une installation anti-chute selon l'une des revendications précédentes.

6. Procédé pour installer une installation anti-chute sur un toit plat, comprenant la fourniture d'un corps en forme de tuile (6) constitué d'un matériau à base de béton pourvu de pieds (4) pour laisser un espace au-dessous dudit corps, **caractérisé en ce que** ledit corps en forme de tuile a un poids minimum de 150 kg, dans lequel ledit corps en forme de tuile est placé sur le toit en utilisant une grue et les pieds, constitués d'un matériau caoutchouteux et pourvus de plus d'une couche adhésive, sont collés à la couverture dudit toit plat.

7. Procédé selon la revendication 6, dans lequel ladite installation anti-chute reste sur ledit toit après que le travail a été effectué sur ledit toit.

Fig 1

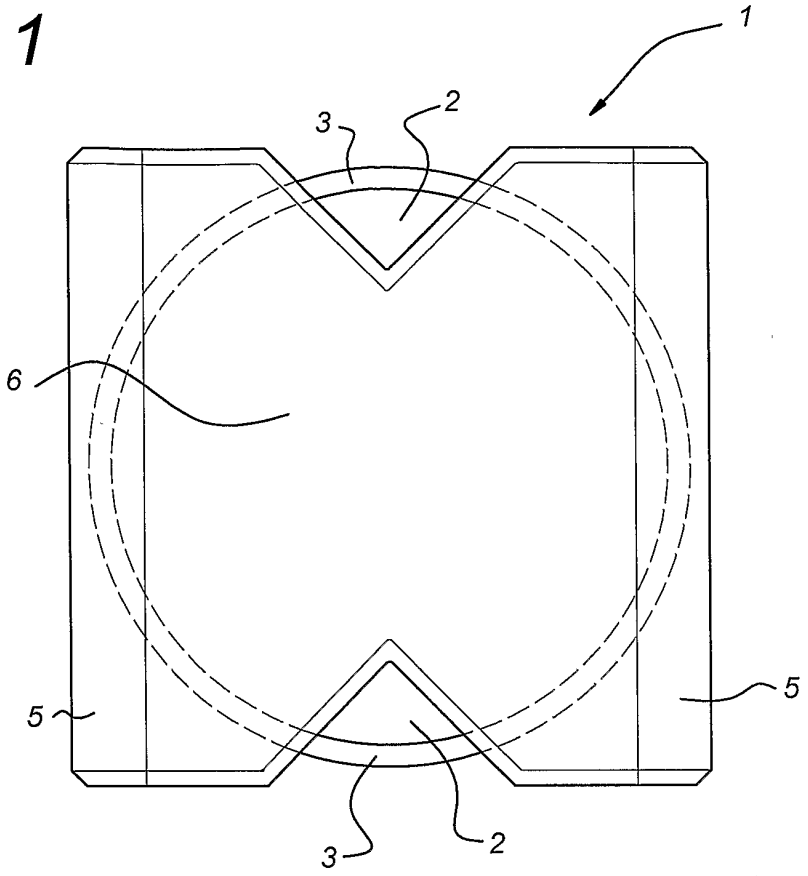
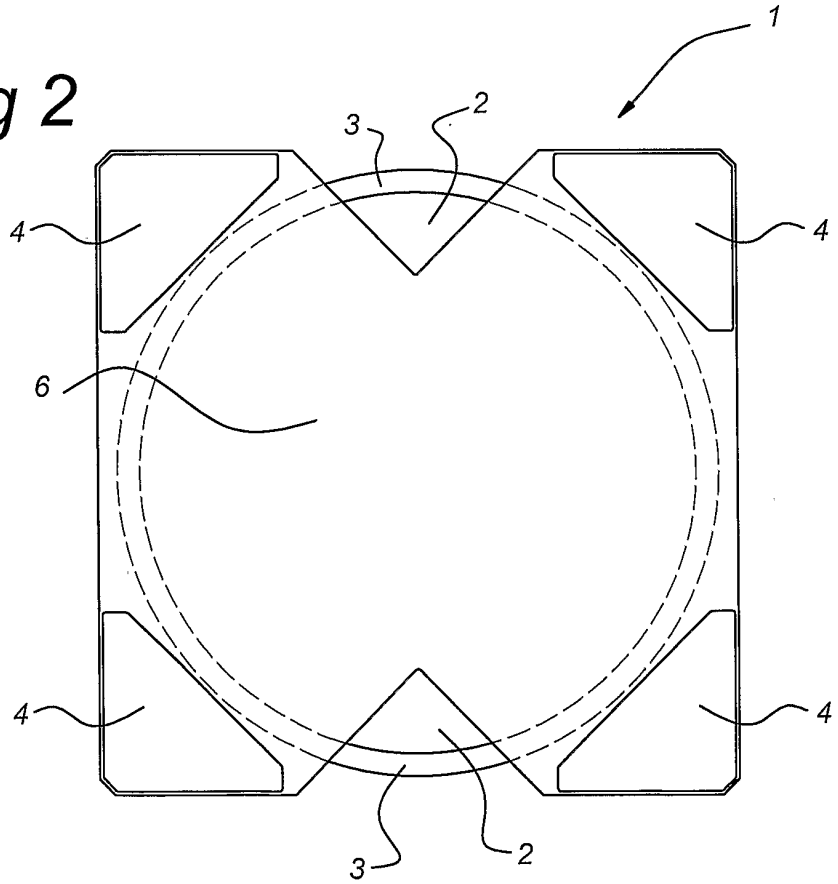


Fig 2



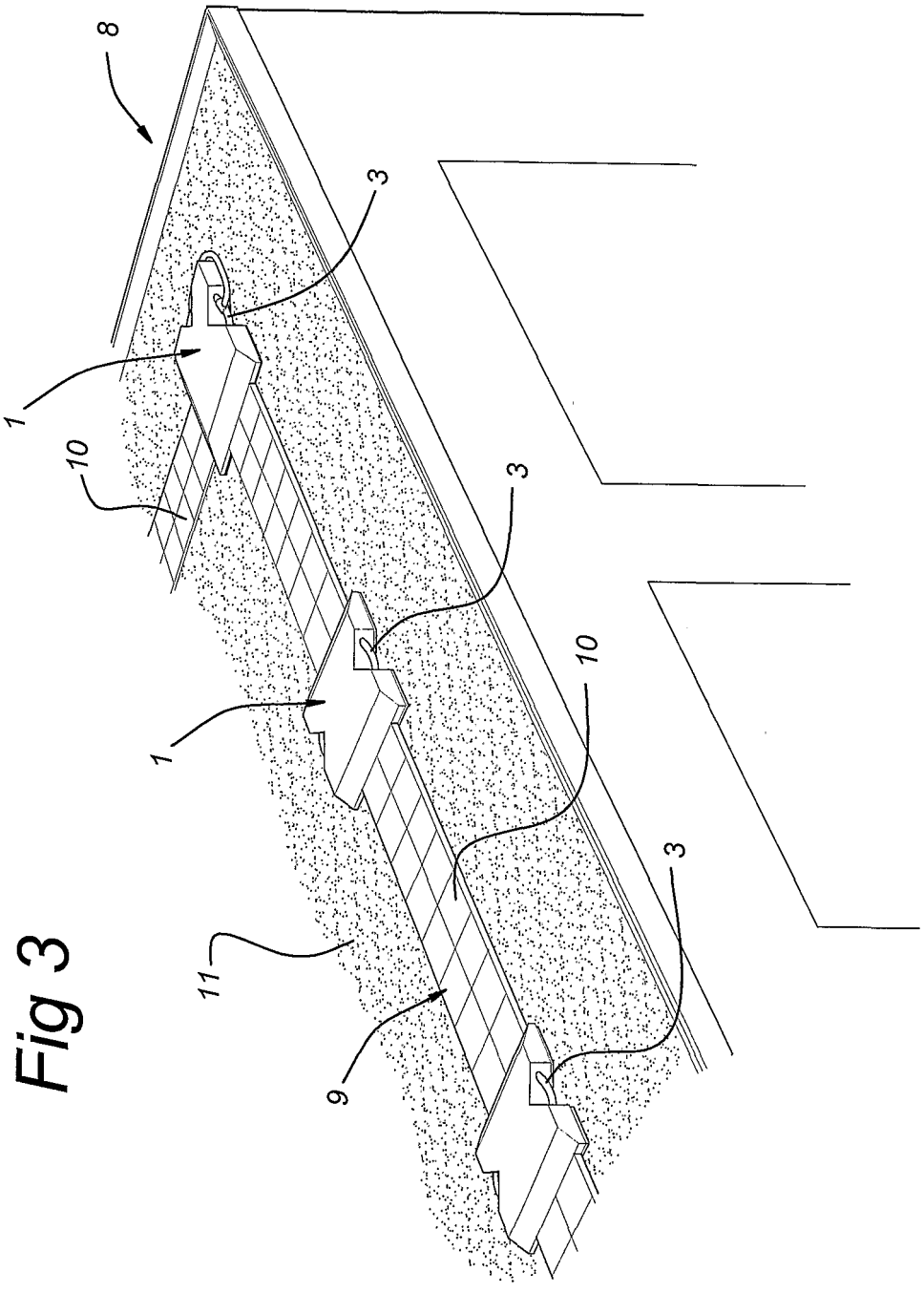


Fig 3

Fig 4

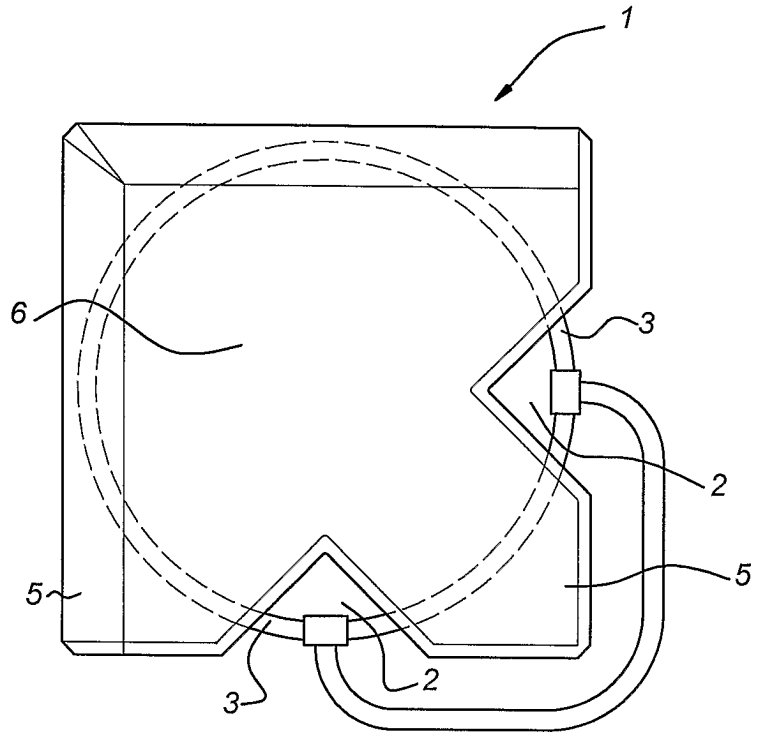


Fig 5

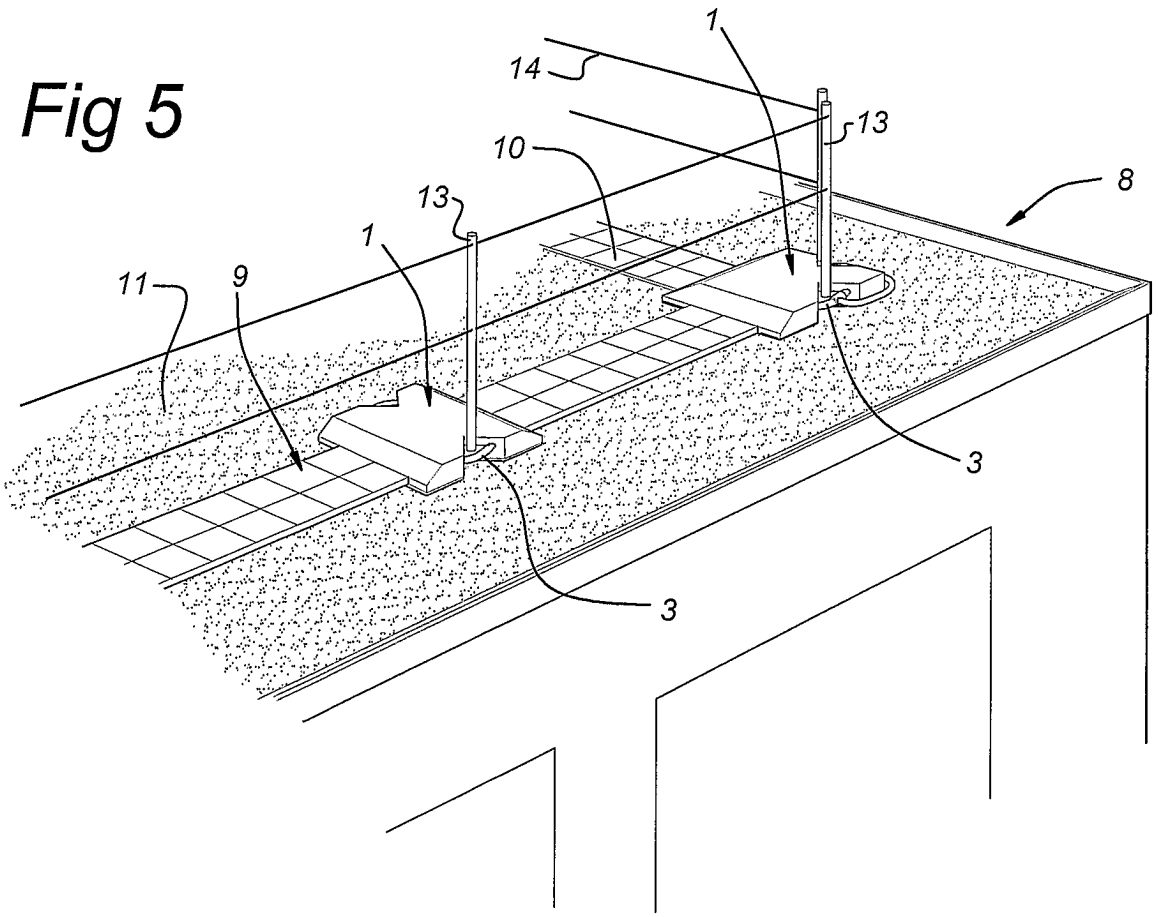
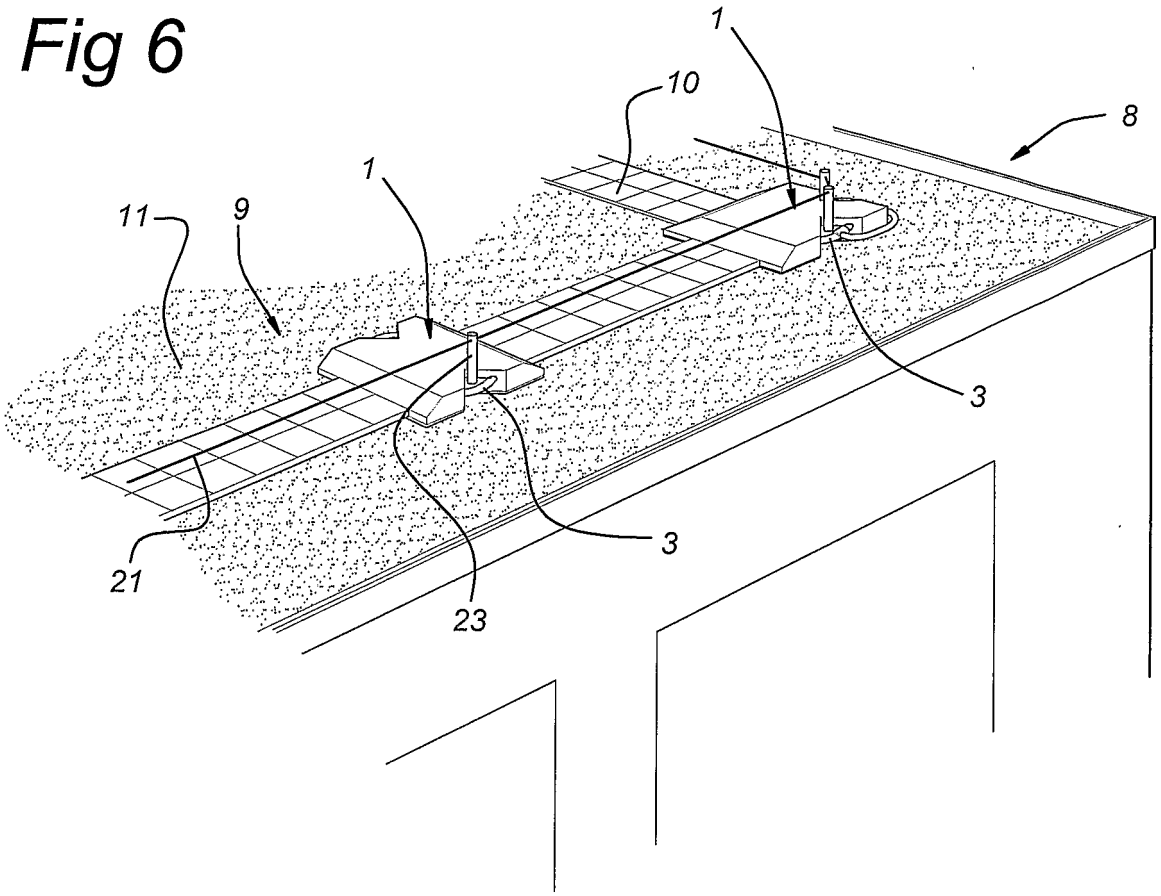


Fig 6



REFERENCES CITED IN THE DESCRIPTION

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