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(54) **Improved module for the construction of road signs and/or anti-slip passage surfaces**

(57) The module is of the type that comprises a one-piece block formed by several flat pieces joined by their opposing bases, generating raised strips in the upper surface of said one-piece block and second strips in bas-relief. The improvements of the invention are characterized in that at least two consecutive flat pieces (2) of the one-piece block (1) are joined by means of an intermediate structure (4) in combination with an adhesive material (4'), said intermediate structure (4) comprising an upper body in the form of a protector, a lower body (6) in the form of an insulating base and an internal space (9) where at least one element selected among: an illuminating element (7) reflecting its light outwards through the upper body (8) in correspondence with the strips in bas-relief, a heating element (10) and a combination of both elements (7-10).

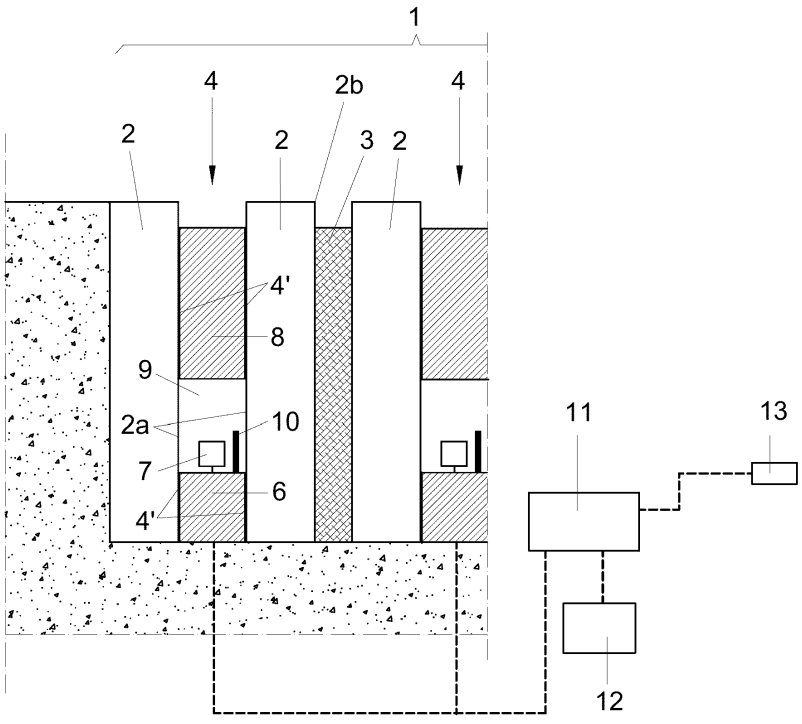

FIG. 1

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to an improved module for the construction of road signs and/or anti-slip passage surfaces.

[0002] Each improved module comprises a one-piece block formed by several flat pieces joined in principle by their opposing bases by means of an adhesive material, highlighting the fact that at least two adjacent pieces of said one-piece block are joined to each other by means of a characteristic intermediate structure in combination with an adhesive material, said intermediate structure integrating illuminating elements whose luminosity is reflected outwards, thus substantially improving the night visibility of road signs and/or anti-slip passage surfaces, such as zebra crossings.

[0003] Therefore, the characteristic intermediate structure allows the visualization of pedestrians under low light and/or the clear identification of the exact location of the road sign by the drivers.

[0004] Even the movement of the pedestrian on the surface of the zebra crossing creates an identifying luminous effect that allows the driver to avoid accidents, as is the case in other conventional zebra crossings.

[0005] Therefore, once the power is activated to supply the illuminating elements, the zebra crossing emits alternate strips of light that are perfectly visible in the dark, thus improving the night visibility of zebra crossings.

[0006] The characteristic intermediate structure also incorporates heating elements supplied with the same power source as the illuminating elements in such a way that, thanks to the heating elements, we achieve surfaces wherein ice does not adhere, thus obtaining safer passages for pedestrians.

BACKGROUND OF THE INVENTION

[0007] Horizontal road signs, such as zebra crossings, direction-indicating arrows, separation lines and others that are created by means of the application of white, yellow or other paints, said paints having anti-slip and light refracting properties, are currently known.

[0008] However, the aforementioned conventional signals present inconveniences related to the high deterioration of the painted surfaces due to the continuous passage of vehicles, which causes periodic repainting with the consequent expenses and inconveniences to pedestrians and drivers.

[0009] The Spanish Patent for invention with publication number ES- B1- 2372086, owned by the same holder of the present invention, consists of a module for the construction of road signs and/or anti- slip passage surfaces.

[0010] The Spanish patent for invention ES-B1-2372086 is especially applicable to zebra crossings, curbs and sidewalks. It is formed by a block of porcelain material whose upper surface presents streaks that determine anti-slip edges, so the own nature of this porcelain material contributes a tone to the block that makes it contrast with respect to the entirety of the road wherein it is inserted, with which the road sign does not require painting or repainting due to deterioration.

[0011] The preferred embodiment of the Spanish patent ES- B1- 2372086, which describes a block of porcelain material formed by a plurality of flat ceramic pieces, joined in adjacency by their main faces with the intermediation of an adhesive material so the upper corners of these flat pieces and holes established therein determine anti- slip edges arranged in correspondence with the upper surface of the block, should be highlighted.

[0012] It should also be noted that at night, in some cases, the luminosity of the zebra crossings is deficient and there is a danger of a driver of a vehicle hitting a pedestrian when the pedestrian is crossing a zebra crossing, especially those that are not regulated by traffic lights.

[0013] Another inconvenience is the formation of ice sheets on the zebra crossings, which are evidently dangerous both for pedestrians and vehicles.

[0014] On the other hand, several systems to electrify road signs and provide them with night visualization or heating means are well-known, but none of them have been developed based on the modules described in the preferred embodiment of the Spanish patent ES-B1-2372086.

DESCRIPTION OF THE INVENTION

[0015] With the purpose of achieving the objectives and avoiding the inconveniences mentioned in the previous sections, the present invention discloses an improved module for the construction of road signs and/or anti-slip surface passages.

[0016] The module present invention is of the type that comprises a one-piece block formed by several flat pieces joined by their opposing bases, generating raised strips in the upper surface of said one-piece block corresponding to each one of the upper corners of said flat pieces and second strips in bas-relief defined between the opposing bases of the aforementioned flat pieces.

[0017] Based on this premise, the improvements of the invention are **characterized in that** at least two consecutive flat pieces of the one-piece block are joined by means of an intermediate structure in combination with an adhesive material, said intermediate structure comprising an upper body in the form of a protector, a lower body in the form of an insulating base, and an internal space where at least one element selected among: an illuminating element reflecting its light outwards through the upper body in correspondence with the strips in bas-relief, a heating element and a combination thereof, is located.

[0018] Another characteristic of the present invention is that the internal space of the intermediate structure is delimited between portions of the opposing bases facing

each other of two consecutive flat pieces, the upper body and the lower body of the intermediate structure.

[0019] In an embodiment of the invention, the upper body of the intermediate structure rests on staggered seats integrated into the opposing bases of the respective flat pieces. This way, the transmission of the load to the lower body and illuminating elements is avoided, the force of the load being supported by the flat pieces.

[0020] The internal space of the intermediate structure comprises at least one heating element, causing the ice not to adhere to the corresponding passage surface, such as a zebra crossing, obtaining with it safer passages for pedestrians. Said heating element is supplied by means of electricity or a heated flow.

[0021] On the other hand, it should be noted that the emission of light outwards allows the visualization of pedestrian and the clear identification of the exact location of the road signs by the drivers, especially at night.

[0022] Next, in order to facilitate a better comprehension of this specification and forming an integral part thereof, figures representing the object of the invention in an illustrative rather than limitative manner have been attached.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023]

Figure 1.- Shows a frontal view of the improved module for the construction of road signs and/or anti-slip passage surfaces according to one embodiment of the present invention. The improved module basically comprises a one-piece block formed by several flat pieces joined in principle by their opposing bases by means of an adhesive material, highlighting the fact that at least two adjacent pieces of said one-piece block are joined to each other by means of a characteristic intermediate structure in combination with an adhesive material.

Figure 2.- Shows a perspective view of the improved module according to a second embodiment.

Figure 3.- Shows a lateral view of one of the improved modules essentially showing the configuration that presents the characteristic intermediate structure located between two consecutive flat pieces.

Figure 4.- Shows a frontal view of a zebra crossing formed by a set of improved modules according to the invention.

DESCRIPTION OF AN EMBODIMENT EXAMPLE OF THE INVENTION

[0024] Taking into account the numeration adopted in the figures, the improved module for the construction of road signs and/or anti-slip passage surfaces of the present invention contemplates the following nomenclature used in the description:

1.- One-piece blocks
1'.- One-piece blocks
2.- Flat pieces
2a.- Opposing bases
2b.- Anti-slip edges
3.- Adhesive material
4.- Intermediate structure
4'.- Glue
5.- Zebra crossing
6.- Lower body
7.- Illuminating element
8.- Upper body
9.- Internal space
10.- Heating elements
11.- Electronic module
12.- Power supply module
13.- Sensor module
14.- Staggered seats

[0025] Each module comprises a one-piece block 1 formed by several flat pieces 2 joined in principle by their opposing bases 2a by means of an adhesive material 3, highlighting the fact that at least two consecutive pieces of said one-piece block are joined to each other not with the aforementioned adhesive material but by means of a characteristic intermediate structure 4 in combination with a glue 4', said intermediate structure 4 integrating illuminating elements 7 whose luminosity is reflected outwards in correspondence with the paving surface of a zebra crossing 5 or similar, thus substantially improving the night visibility of road signs and/or anti-slip passage surfaces, such as the aforementioned zebra crossing 5.

[0026] This zebra crossing 5 comprises dark strips formed by one-piece blocks 1' lacking intermediate structures 4, and light strips formed by the one-piece blocks 1 that integrate the intermediate structures 4 into their illuminating elements 7.

[0027] The characteristic intermediate structure 4 comprises a lower body 6 in the form of an anti-slip base in which at least one illuminating element 7 is inserted, and an upper body 8 in the form of a protector that lets light pass through the same, at least partially, so said light reaches the surface of the pavement to be seen at night by pedestrians and drivers.

[0028] The illuminating elements 7 are located at an internal space 9 delimited between the lower body 6, the upper body 8 and portions of the opposing bases 2a facing each other of two consecutive flat pieces.

[0029] In one embodiment, the illuminating elements 7 comprise LED supports to emit lines of light.

[0030] Another option is the incorporation of a heating element 10 to produce the heating in the module of the invention in order to prevent the formation of ice in the zebra crossing 5, thus obtaining greater security both for pedestrians and for drivers, especially at night.

[0031] Both the illuminating elements 7 and the heating elements 10 will be perfectly encapsulated in an airtight manner within the internal space 9 to prevent their deterioration due to humidity, as this is a product installed outdoors.

[0032] The free upper surface of each one-piece block 1 comprises first raised strips corresponding with one of the corners of the flat pieces 2 and second strips in bas-relief corresponding with the adhesive material and also with the characteristic intermediate structure 4, thus generating anti-slip edges 2b in correspondence with the upper corners of said flat pieces 2.

[0033] The improvements of the invention are supplemented with an electronic module 11 that controls a supply module 12 and a sensor module 13 to activate the luminous elements 7 and the heating elements 10, depending on different parameters, schedules, environmental luminosity, thermal conditions, etc.

[0034] In one embodiment, the electronic module 11 comprises a programmable automaton based on accumulators supplied by photovoltaic, eolic or other means.

[0035] In one embodiment of the invention, it has been envisaged that the upper body 8 of the intermediate structure 4 rests on staggered seats 14 made in the respective opposing bases 2a of the flat surfaces 2, thus avoiding the transmission of the load to the lower body 6, illuminating elements 7 and heating elements 10, the force of the load being supported by the flat pieces 2.

[0036] In another embodiment of the invention, the intermediate structure 4 is integrated into an enveloping resin body or similar in the form of an airtight encapsulation.

[0037] Both in this embodiment and in the others, the deterioration due to humidity of the illuminating elements 7 and heating elements 10 will be avoided.

Claims

1. **Improved module for the construction of road signs and/or anti-slip passage surfaces**, wherein the module comprises a one-piece block (1) formed by several flat pieces (2) joined by their opposing bases (2a), generating raised strips on the upper surface of said one-piece block (1) corresponding with each one of the upper corners of said flat pieces, and second strips in bas-relief defined between the opposing bases of the flat pieces;
   characterized in that the module further comprises an intermediate structure (4) such that:

   at least two consecutive flat pieces (2) of the one-piece block (1) are joined by means of the intermediate structure (4) in combination with an adhesive material (4'); and wherein the intermediate structure (4) comprises an upper body (8) in the form of a protector, a lower body (6) in the form of an insulating base and an internal space (9) where at least one element selected among: an illuminating element (7) reflecting its light outwards through the upper body (8) in correspondence with the strips in bas-relief, a heating element (10) and a combination of both elements (7-10).

2. **Improved module for the construction of road signs and/or anti-slip passage surfaces** according to claim 1, **characterized in that** the internal space (9) of the intermediate structure (4) is delimited between portions of the opposing bases (2a) facing each other of two consecutive flat pieces (2), the upper body (8) and the lower body (6) of the intermediate structure (4).

3. **Improved module for the construction of road signs and/or anti-slip passage surfaces** according to any one of the previous claims, **characterized in that** the upper body (8) of the intermediate structure (4) rests on staggered seats (14) integrated into the opposing bases (2a) facing each other of the respective flat pieces (2).

4. **Improved module for the construction of road signs and/or anti-slip passage surfaces** according to claim 1, **characterized in that** it integrates at least one heating element (10) located within the internal space (9) of the intermediate structure (4) and supplied by means of a source selected among: an electrical source and a heating fluid.

5. **Improved module for the construction of road signs and/or anti-slip passage surfaces** according to any one of the previous claims, **characterized in that** the intermediate structure (4) is integrated into an enveloping body in the form of an airtight encapsulation.

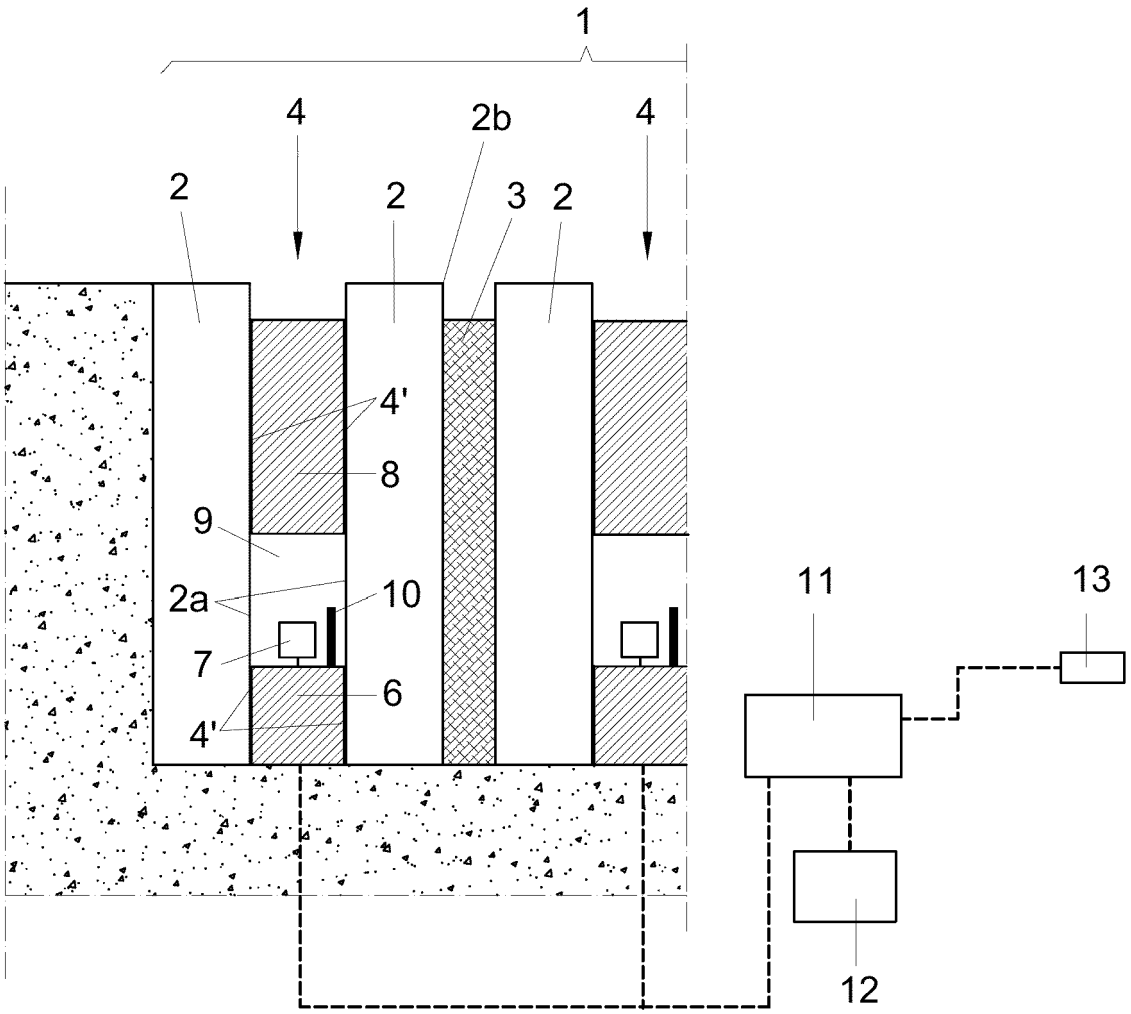

FIG. 1

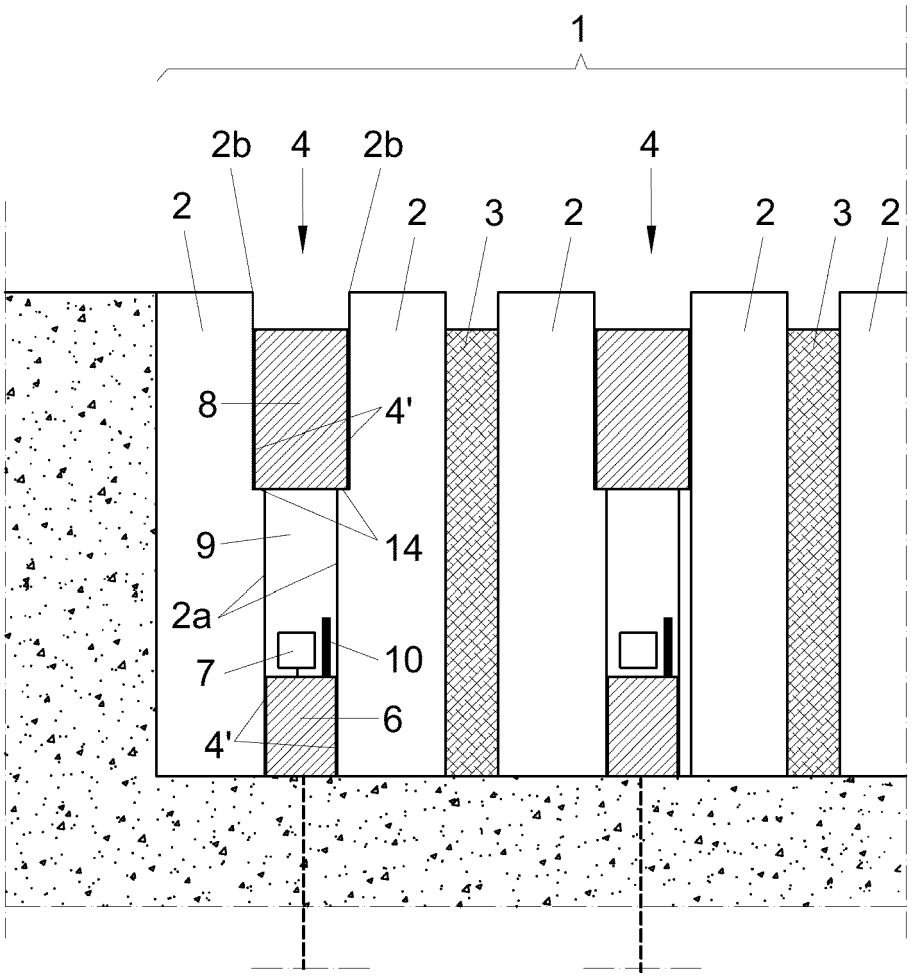

FIG. 2

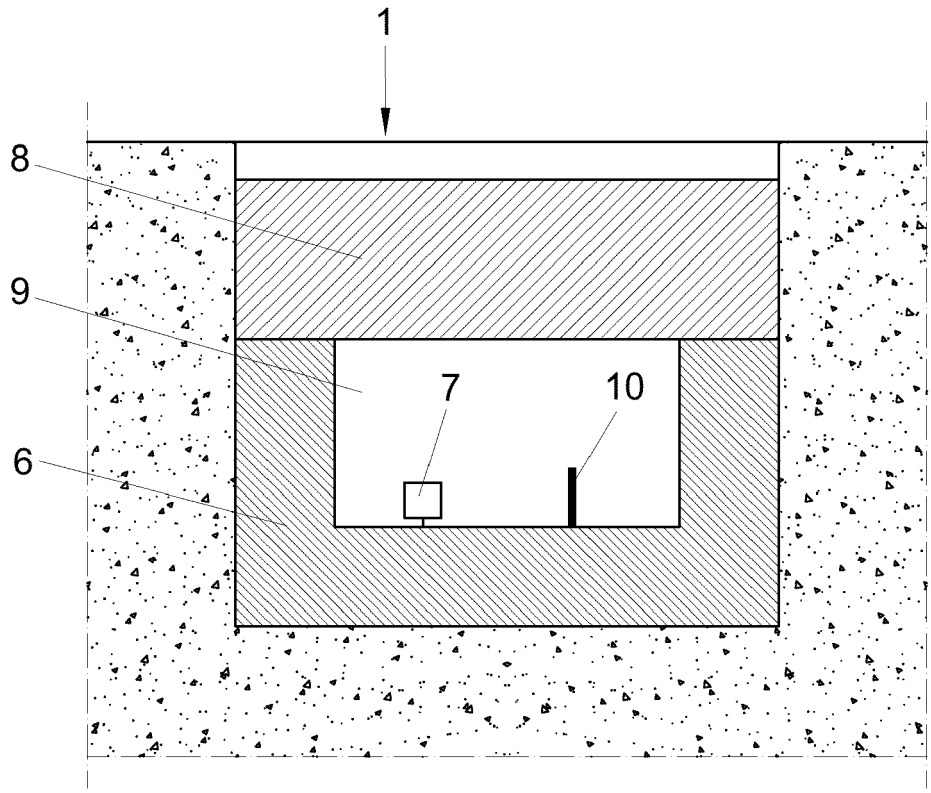

FIG. 3

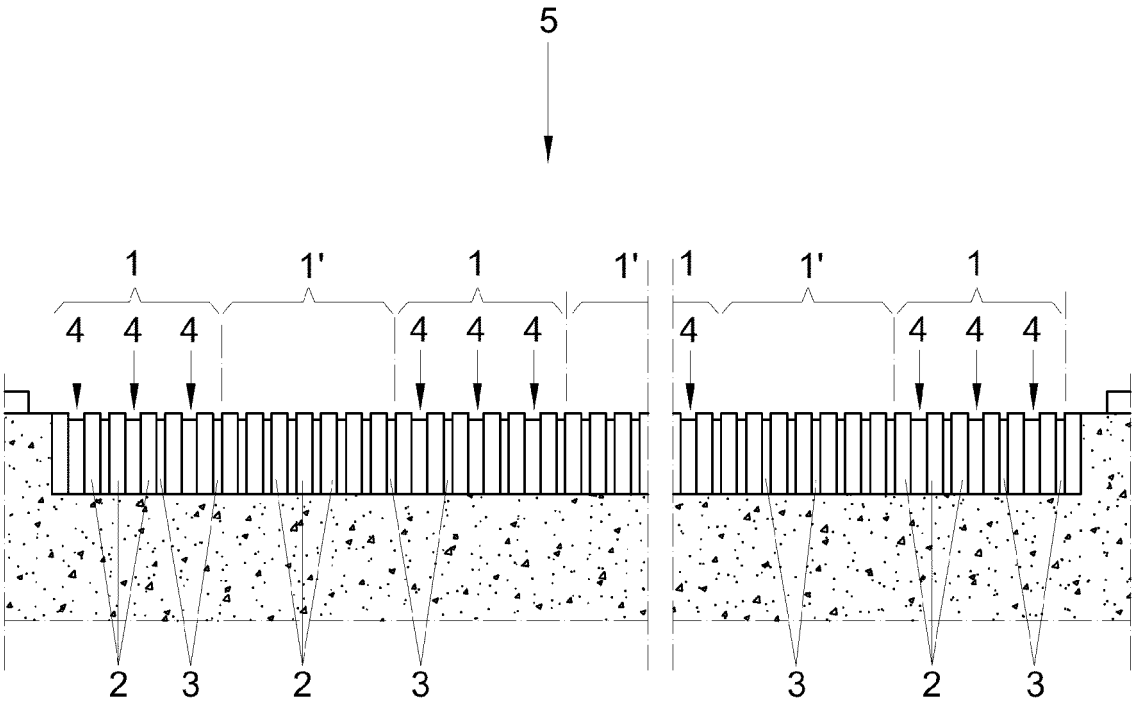

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 13 16 0109

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	31 July 2013	Kremsler, Stefan

CATEGORY OF CITED DOCUMENTS

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