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(54) **Photoluminescent signaling slab and manufacturing process**

(57) The invention relates to a photoluminiscent signaling slab and a manufacturing process. A slab offering long luminescence durability is obtained by means of applying a luminescent paint layer (2) and a protective layer on the lower face (11) of a transparent tile (1).

The slab can further incorporate a support (4) or a mesh (6) increasing the resistance of the slab and its handling.

The protective layer can be made of a lacquer layer (3) formed by a mixture of polyamide resin and epoxy rosin for example.

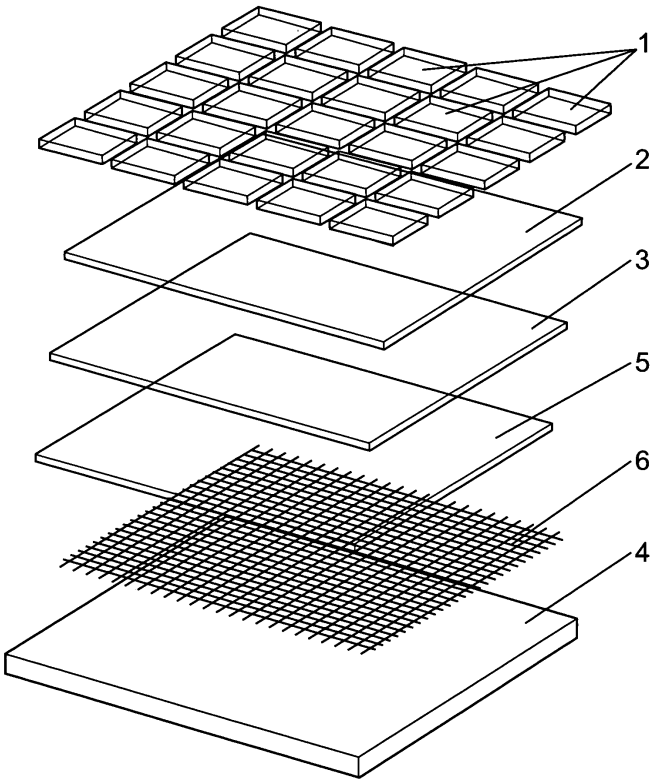

FIG. 1

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Description

Field of the Invention

[0001] The present invention relates to a slab which allows carrying out long-lasting photoluminescent signaling and the manufacturing process thereof.

State of the Art

[0002] The invention belongs to the field of signaling. It can therefore be used for signaling construction work sites, stairs, railway platforms, emergency exits, etc.

[0003] While signaling any element, it is convenient to do so in a luminescent manner, so that in the case of poor visibility situations due to lack of electrical current, at night or due to any other reason, the sign glows with the energy it has accumulated. A series of phosphorescent paints which are applied to the signs so that they have said-effect are known for this purpose.

[0004] The main drawback of this paint is its short durability because it can be altered in several ways. On one hand, it does not withstand the chemical attack of the atmosphere or of some substances to which it is applied (for example cement).

[0005] To prevent the attack of the substances on which it is applied, it is possible to place the paint on a rubber strip or the like, acting as an intermediary between the paint and the substance of the wall or floor.

[0006] The second type of attack is physical, especially when the sign must be placed on the floor, for example, to mark the edge of a platform, a staircase, or the path to an emergency exit. In this case, when it is stepped on the paint is damaged and gets dirty quickly, therefore it lasts even less.

[0007] Consequently, to comply with the quality standards established for emergency signaling, it is necessary to change all the luminescent signs frequently, even more so if the signs are located on the floor.

Description of the Invention

[0008] The present invention relates to a luminescent signaling slab having a greatly increased durability, being able to be located both on the wall and on the floor and arranged to be stepped on. The invention also comprises a process for manufacturing luminescent signaling slabs.

[0009] The signaling slab is formed from a transparent tile, on the lower face of which a luminescent paint layer (for example a ZnS:Cu based paint) is applied, and a protective layer completely covering the paint layer.

[0010] The tile must only meet the transparency requirement and must be made of a hard and resistant material if the slab is to be stepped on. Apart from that, it can have various sizes, it can be smooth or rough, with or without touches of color, and it can incorporate a design which will be visible with the luminescence of the paint.

[0011] The slab can further have a support located on the protective layer, which will allow handling the slab and fixing it to the construction elements without using said protective layer.

[0012] To add resistance to the slab, especially if the tiles are small, a wire or glass fiber mesh, or a mesh made of any other material, can be added between the protective layer and the support, and fixed to both by any suitable means, for example an adhesive.

[0013] As regards the manufacturing process, it is based on the successive application of a paint layer on the tower face of the tile and of a protective layer on the paint layer, covering it completely. The method of applying both layers may vary and any person skilled in the art knows many of such methods.

[0014] Other optional steps generating variations for the slab can be added to these two steps. For example, there is a step for fixing a support, which will take place after fixing the protective layer, or for fixing it to the mesh, just before fixing the support.

[0015] A special case is to make a design, legend or drawing on the tile, because if it is made on the lower face of said tile, it must be the first step that is carried out, whereas if it is located on the other face, it can be done at any time.

[0016] Finally, the protective layer can be carried out in several manners, but only some possible types will be mentioned by way of a non-limiting example:

First, it can be formed by a lacquer layer, using any type of lacquer, it being especially interesting to do this by means of a mixture of polyamide resins and epoxy resins. Xylene can be used as an organic solvent.

[0017] The protective layer can also be carried out by means of a cellulose layer, an asphalt fabric overlay, a layer of plastic or of glass,...

Description of the Drawings

[0018] To better understand the invention, an embodiment thereof will be very briefly described below as an illustrative and non-limiting example thereof. To that end, reference is made to the attached drawings, Figure 1 and Figure 2, which show two exploded views of two embodiment variants of the signaling slab.

Description of an Embodiment

[0019] Figures 1 and 2 show exploded views of two signaling slabs according to variants of the invention.

[0020] A transparent, generally glass tile (1) can be seen in said figures, but it could also be a methacrylate tile or a tile of any other transparent material having suitable hardness. Sometimes the tile (1) may incorporate a type of color, but always meeting the luminosity conditions provided under the law.

[0021] The tile (1) has on its lower face (11) a photoluminescent paint layer (2) carried out with some of the photoluminescent paints existing on the market, for example, a paint based on the pigment ZnS:Cu, or another similar paint.

[0022] The paint layer (2) may cover the entire lower face (11) of the tile (1) or precise designs can be made on said lower face (11).

[0023] A protective layer, for example a lacquer layer (3), is located under the paint layer (2). Said lacquer can be made of polyamide and epoxy resins and dissolved in an organic solvent such as, for example, xylene.

[0024] Given the properties of the lacquer layer (3), it is possible to place the slab with the lower face (11) in contact with the cement or the like, for example the cement with which the slab is fixed. The lacquer layer (3) chemically insulates the paint, whereas the tile (1) protects it from the atmosphere and from mechanical wear.

[0025] A support (4) facilitating handling of the slab and the fixing thereof, and which is adhered to the rest of the slab by means of the lacquer layer (3) itself or a suitable adhesive (5), can be located under the lacquer layer (3).

[0026] In addition, the tile (1) can offer variable features according to its function. It can thus be perfectly smooth and transparent, maximizing the luminosity it lets pass through, it can be rough on the outermost face to achieve anti-slipping properties or a surface which provides information by touch (for example for the blind), or it can have a design (12), legend or drawing on either of its sides which will be particularly noticeable when the slab emits light and carries out its signaling function due to the lack of surrounding light. If the design (12) is applied on the lower face (11), it must be done before applying the paint.

[0027] As regards the size and shape of the tile (1), it can also be varied, being able to carry out the sign with a single tile (1), having a suitable size, a small number of tiles (1), or by means of many small tiles (1). Figures 1 and 2 show two variants.

[0028] It is possible and useful to add a fiber glass mesh (6) or one of another material which increases the cohesion between the different tiles (1), especially when said tiles (1) are small.

[0029] Finally, the thickness of the tile (1) may vary, always taking into consideration the use which the slab will be given.

[0030] The manufacturing process for manufacturing the signaling slabs comprises two necessary steps, and extra steps with added advantages can be added:

a) Carrying out a photoluminescent paint layer (2) on a lower face (11) of a tile (1), by means of processes such as screen printing, projection by means of guns, airbrushes, glazing hoods,... or any other known process.

b) Applying a protective layer, once the paint layer (2) is dry, on said paint layer (2). The specific method may vary according to the type of protective layer, the way to apply each type of protective layer being known by any person skilled in the art.

[0031] As a first variant, a step can be added after applying the protective layer which will be fixing a support (4) contiguous to the protective layer, either by means of an adhesive (5) or directly.

[0032] A second variant consisting of making a design (12), legend or drawing on one of the faces of the tile (1). If the design (12) is made on the lower face (11) it must be drawn before applying the paint layer (2). Otherwise it can be applied at any time.

[0033] A third variant will be applied when the tiles (1) are small and more resistance is to be given to the assembly. In this case a mesh (6) will be applied joining all the tiles (1) together, for example after applying the protective layer and before placing the support (4). The fixing adhesive (5) can be used for placing it.

[0034] As regards the types of protective layer, a lacquer layer (3) can be used which is carried out, for example, by means of polyamides and epoxy, an asphalt layer, another glass element,...

[0035] Once the slab has been carried out, it will be fixed in its place of use, such that the tile (1) is the only part that can be accessed from the outside. The paint layer (2) will receive the surrounding light through the tile (1) and will accumulate power to then subsequently release it in the form of light.

Claims

1. A photoluminescent signaling slab, especially for signaling in poor luminosity conditions, **characterized in that** it comprises a transparent tile (1) with a lower face (11) on which a luminescent paint layer (2) and a protective layer are applied, said paint layer (2) being coveted by the protective layer.

2. A slab according to claim 1, **characterized in that** it further comprises a support (4) contiguous to the protective layer on the side opposite to the paint layer (2).

3. A slab according to claim 2, **characterized in that** it comprises a mesh (6) between the protective layer and the support (4).

4. A slab according to any of claims 1 to 3, **characterized in that** it comprises a design (12) in the tile (1).

5. A slab according to any of claims 1 to 4, **characterized in that** the protective layer is a lacquer layer (3).

6. A slab according to claim 5, **characterized in that** lacquer layer (3) is made of a mixture of polyamides and epoxy.

7. A slab according to claim 6, **characterized in that** the lacquer is made up of epoxy resin, polyamide resin and an organic solvent.

8. A process for manufacturing a luminescent slab, **characterized in that** it comprises the steps of:

- applying a luminescent paint layer (2) on a lower face (11) of a transparent tile
- applying a protective layer on the paint layer (2), completely covering said paint layer (2).

9. A process according to claim 8, **characterized in that** it comprises a step for fixing a support (4) on the protective layer once it has been applied to the paint layer (2).

10. A process according to claim 9, **characterized in that** it comprises fixing a mesh (6) between the protective layer and the support (4)

11. A process according to any of claims 8 to 10, **characterized in that** it comprises a step for making a design (12) on the tile (1).

12. A process according to any of claims 8 to 11, **characterized in that** the protective layer is a lacquer layer (3).

13. A process according to claim 12, **characterized in that** the lacquer layer (3) is made of a mixture of polyamides and epoxy.

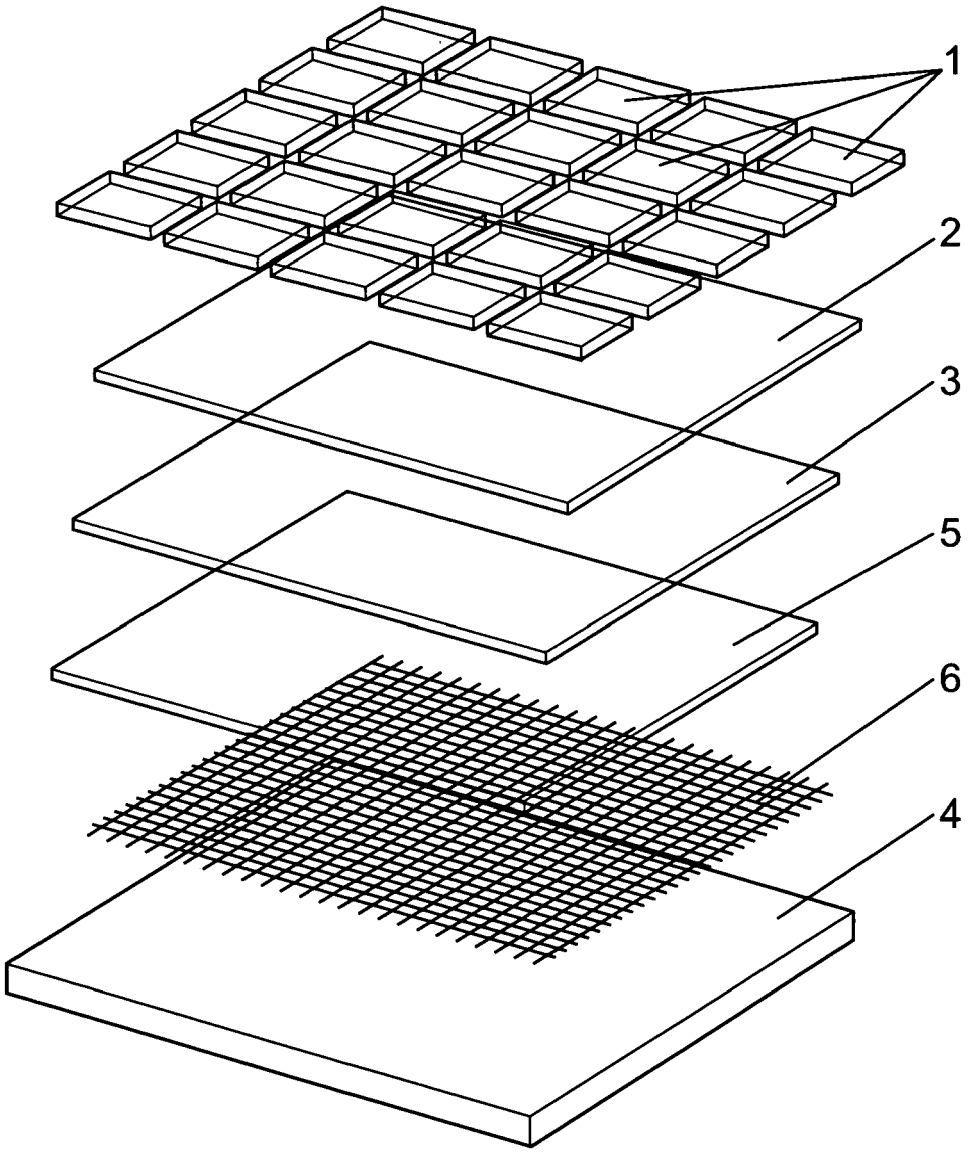

FIG. 1

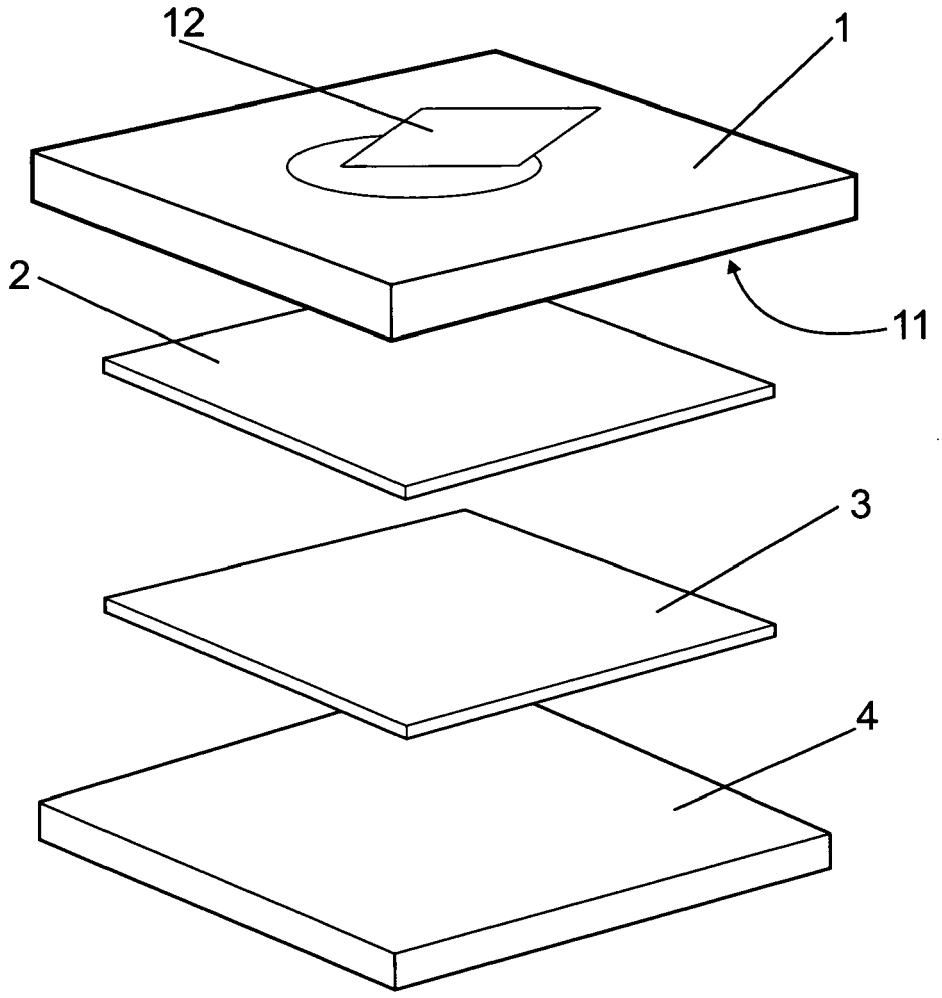

FIG. 2