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54 Security tile.

57 A safety tile comprising a concrete bottom tile (6) and a rubber cover tile (1). Air cavities are left free between the bottom tile (6) and the cover tile (1). The cover tile (1) is anchored in the bottom tile (6) because anchoring pins (5, 8) connected with the cover tile (1) extend through openings (7) in the bottom tile (6) so as to be freely movable in a vertical sense.

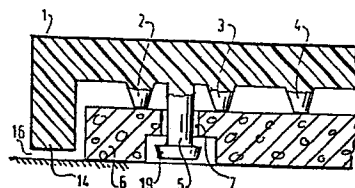


FIG.1

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The invention relates to a safety tile comprising a concrete bottom tile and a rubber cover tile being anchored in the concrete bottom tile by means of anchoring pins integral with the cover tile whilst leaving free air cavities.

5 Such a safety tile is known from Dutch patent application 72.00920.

Although such a tile has a satisfying effect in practice, there is a need for a safety tile having a higher damping value than the existing file, particularly in the zones
10 of neighbouring tiles.

Therefore, the invention has for its object to provide a safety tile having a higher damping value than the tile hitherto known. According to the invention this is achieved by inserting the anchoring pins into openings in the bottom
15 tile and anchoring them by means of guard elements. Since the anchoring pins are no longer embedded in the concrete of the bottom tile, but arranged to be, in principle, freely movable in a vertical sense, the damping value of the tile embodying the invention is considerably enhanced. The tile referred to
20 in the preamble has a limited damping value, in particular in the zone around the anchoring points. This is due to the

fact that the anchoring pin is rigidly connected with the concrete tile.

The guard elements are preferably made from flexible material. In this way the anchoring pins can perform some movement in a direction of length. The guard elements may, for example, be formed by rubber rings glued to the anchoring pins. As an alternative the guard elements may be formed by pins passed through the anchoring pins in a transverse direction. As a further alternative transversely directed elements integral with the anchoring pins may be used, which snap into the openings in the concrete tile.

In order to obtain a safety tile with a flat underside the guard elements are preferably located in depressions in the bottom tile.

A safety tile embodying the invention can be obtained by making a concrete bottom tile, making a rubber cover tile with anchoring pins, sliding the bottom tile onto the cover tile and arranging the guard elements.

Since in the safety tile embodying the invention the cover tile is no longer firmly anchored in the concrete tile, it is possible to further improve the damping value especially in the peripheral zone. According to the invention this is achieved by choosing the length of the side edges of the cover tile to be smaller than the overall thickness of the safety tile. Thus the side edge is free of the substrate and is, therefore, capable of performing a vertical movement.

The invention will be set out with reference to the drawing showing an embodiment. The drawings show in:

Fig.1 a sectional view of a safety tile embodying the invention,

Fig.2 a detail of the safety tile embodying the invention in a sectional view, the guard element being a rubber pin or the like,

Fig.3 a sectional view of a detail of a safety tile embodying the invention, the guard element being a rubber or synthetic resin ring,

Fig.4 a sectional view of a concrete bottom tile associated with the safety tile embodying the invention.

The safety tile embodying the invention comprises a rubber cover layer 1 applied to a concrete bottom tile 6. On the side facing the concrete bottom tile the rubber cover layer is provided with pinshaped spacers 2,3,4 and anchoring pins 5. 5 The spacers as well as the anchoring pins are integral with the cover layer. It is noted here that other forms of spacers may be chosen rather than spacers in the form of pins. The anchoring pin 5 is passed through an opening 7 in the concrete bottom tile 6. This also applies to the anchoring pin 8, which 10 is passed through an associated opening 9. In order to couple the rubber cover layer with the concrete bottom tile guard elements are arranged on the anchoring pins 5,8. These guard elements may have different shapes. Fig.2 shows that the guard elements have the form of a transverse pin 10 passed through 15 the anchoring pin 5. Fig.3 shows that the guard elements have the shape of a guard ring 11 slipped around the anchoring pin and glued to the anchoring pin. In order to obtain a flat underside of the safety tile the concrete bottom tile has openings widened on the underside by depressions 12,13 as shown 20 in Fig.4. These recesses may, as an alternative, have a conical shape.

In the safety tile embodying the invention the cover layer is connected with the concrete bottom tile in a manner such that the anchoring pins of the cover layer may perform 25 some longitudinal movement. This results in an appreciable improvement of the damping value in the zone around the anchoring pins.

In a further embodiment of the safety tile according to the invention the side rims 14, 15 grip around the entire 30 side edge of the concrete bottom tile 17. In this way anchoring is improved, whilst nevertheless a vertical movement remains possible. A further improvement of the damping value in the peripheral zones is obtained in that the length of the side rim 14 (Fig.1) is smaller than the overall thickness of the 35 safety tile 16. Thus the side rim can perform a vertical movement.

By disposing two similar safety tiles closely to one another a satisfactory damping value is obtained also at the boundary face of adjoining tiles owing to the contacting

side rim of the rubber cover layer. By providing recesses 18
in the side rims of the tile a given horizontal expansion is
allowed. These recesses may cover the entire length of the
side rims in order to improve water drainage. The safety tile
5 embodying the invention can be made more easily and accurately
than the known safety tile. Moreover the water drainage is
improved.

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CLAIMS

1. A safety tile comprising a concrete bottom tile (6) and a rubber cover tile (1), which is anchored by means of anchoring pins (5,8) integral with the cover tile (1) in the concrete bottom tile (6) whilst leaving free air cavities, 5 characterized in that the anchoring pins (5,8) extend through openings (7,9) in the bottom tile (6) and are anchored by means of guard elements (10,11,15).

2. A safety tile as claimed in claim 1, characterized in that the guard elements are made from flexible material.

10 3. A safety tile as claimed in claims 1 and 2, characterized in that the guard elements are formed by rubber rings (11) glued to the anchoring pins (5,8).

4. A safety tile as claimed in claims 1 and 2, characterized in that the guard elements consist of pins (10) 15 passed transversely through the anchoring pins (5,8).

5. A safety tile as claimed in claim 1 to 4, characterized in that the guard elements are located in depressions (12,13) in the bottom tile (6).

20 6. A method of manufacturing a safety tile as claimed in claims 1 to 5, characterized by making a concrete bottom tile (6), making a rubber cover tile (1) with anchoring pins

(5,8), sliding the bottom tile (6) onto the cover tile (1) and arranging the guard elements (10,11).

7. A safety tile as claimed in claims 1 to 5,
5 characterized in that the side rims of the rubber cover tile grip around the side edge of the concrete bottom tile (Fig.2).

8. A safety tile as claimed in claim 1, characterized in that the guard element has the form of a transversely directed element (19) being integral with the pin (5,8).

9. A safety tile as claimed in claim 1, characterized
10 in that the length of the side rims (14,15) is chosen to be smaller than the overall thickness of the safety tile (16, Fig.1).

10. A safety tile as claimed in claims 1 to 9,
characterized in that the rims (14,15) of the cover tile have
15 as recess (18) on the top side (Fig.3).

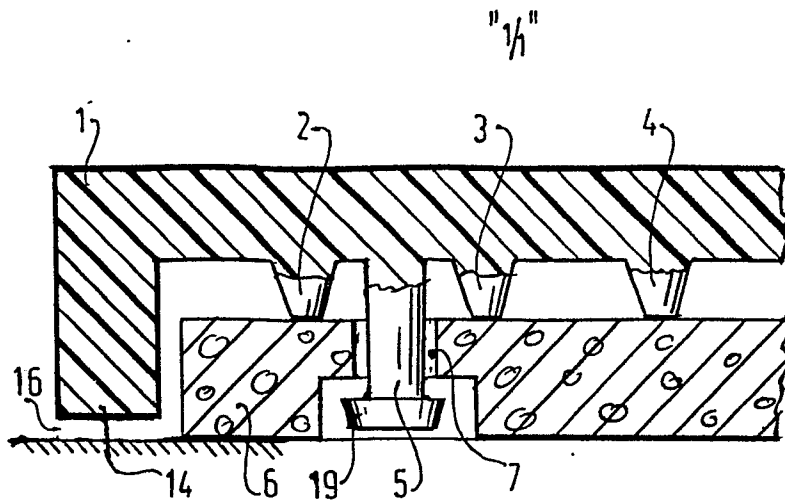


FIG. 1

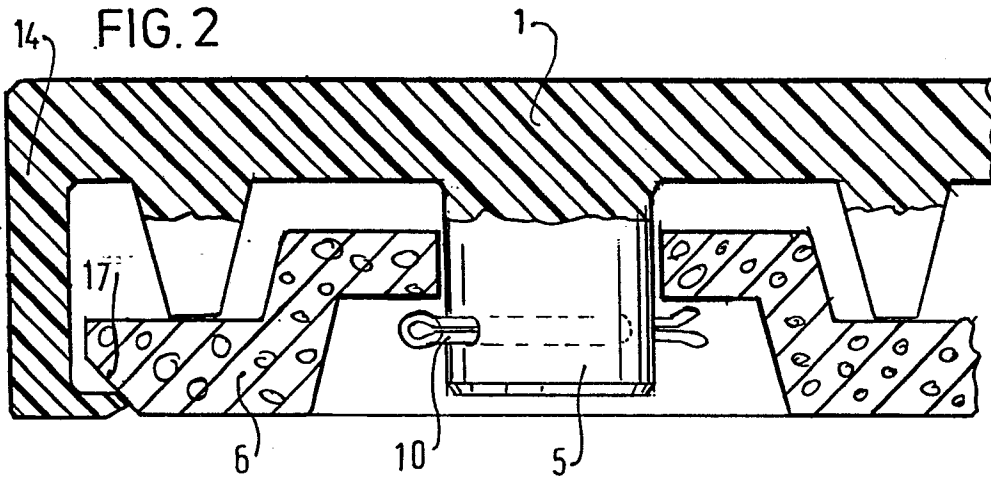


FIG. 2

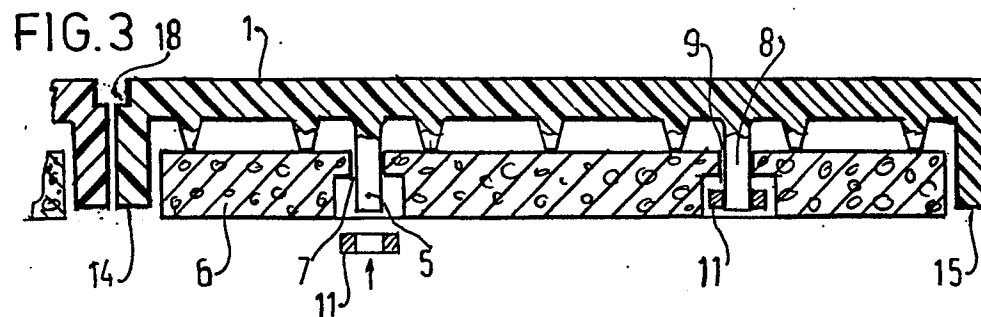


FIG. 3

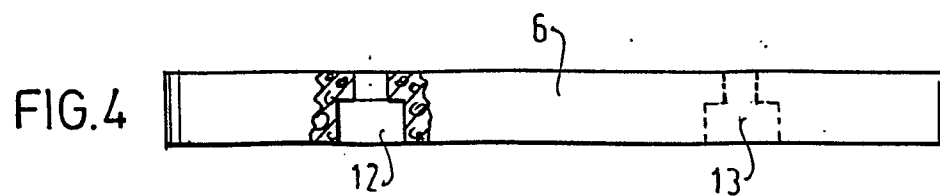


FIG. 4



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Y	DE-A-1 943 126 (RUBBERFABR. INDIANA) * Whole document *	1,4,6	E 01 C 13/00 E 01 C 5/22
Y	GB-A- 401 029 (DUFFY) * Page 1, line 75 - page 2, line 49, lines 63-83; figures 1,2 *	1,5,6	
A	GB-A- 286 168 (HOLMES) * Page 1, line 85 - page 2, line 75; figures 1-8,10,11 *	1,5,6	
A	FR-A-1 013 789 (CAOUTCHOUC RENO) * Whole document *	1,7	
A	NL-A-7 014 057 (METALLWARENFABR. VENLO) * Page 3, line 9 - page 4, line 35; figures 1-4 *	1,7,10	TECHNICAL FIELDS SEARCHED (Int. Cl. 3) E 01 C E 04 F
A	EP-A-0 058 825 (WEGU) * Page 8, line 9 - page 9, line 23; figure 1 *	1,7,9,10	
A	DE-A-2 302 299 (RUBBERFABR. INDIANA) * Page 4; claims 1-4; figures 1,2 *	1,7,8	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 05-03-1984	Examiner DIJKSTRA G.
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 & : member of the same patent family, corresponding document			



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A	NL-A-7 502 073 (ROLL-RINK) * Page 3, line 8 - page 4, line 16; figures 1-4 *	1,2,8	
A	FR-A-2 491 114 (VILLENROY & BOCH) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 05-03-1984	Examiner DIJKSTRA -G.
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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 & : member of the same patent family, corresponding document	