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(54) **Gymnastics exercise floor**

(57) A gymnastics exercise floor (50) comprising a rectangular subfloor (40) provided with panels (5,8,10,15,16,30). A compressible top layer (95) is provided on the panels. The panels in the rectangular sub-

floor are diagonally arranged. The top layer is furthermore arranged in strips on the subfloor, with the strips of the springy top layer including an acute angle with the panels.

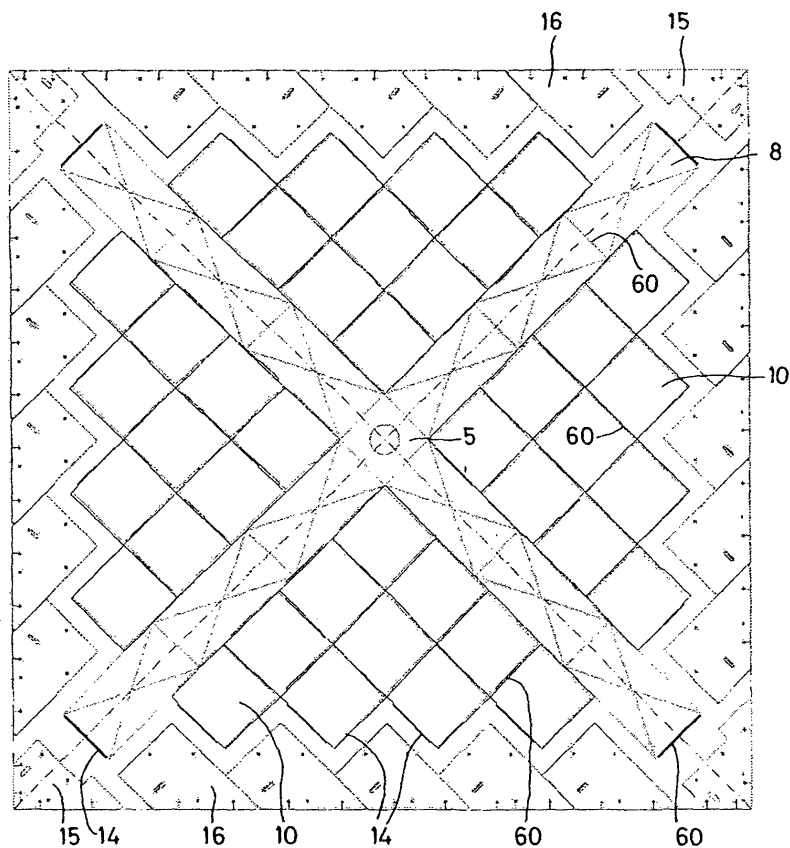


FIG. 4

EP 1 611 930 A1

Description

[0001] The invention relates to a gymnastics exercise floor comprising a rectangular subfloor provided with panels, on which panels a top layer is provided.

[0002] A known gymnastics exercise floor is a springy floor construction measuring about 14 metres by 14. On this gymnastics exercise floor an exercise area measuring 12 metres by 12 is marked out with lines. The gymnastics exercise floor is built up of a subfloor consisting of panels having a specific stiffness as well as a compressible top layer. The panels are usually made of wood, because of the advantageous resilience and damping characteristics thereof. The sides of the panels extend parallel to the edges of the gymnastics exercise floor. With the known gymnastics exercise floor, the compressible top layer is rolled out in strips over the panels, parallel to the edges of the gymnastics exercise floor.

[0003] During contests, gymnastic exercises are performed over the entire floor area during a specific period. Generally, so-called acrobatic exercises are performed on the diagonals of the gymnastics exercise floor, whilst the remaining floor area is used for so-called gymnastic exercises. Certain requirements are made as regards the resilience and damping characteristics of the floor, in particular for the acrobatic exercises.

[0004] A drawback of the known gymnastics exercise floor, in particular the subfloor, is the fact that the resilience and damping characteristics thereof vary strongly along the diagonals, which is undesirable, in particular for the acrobatic exercises.

[0005] The object of the present invention is to provide a gymnastics exercise floor that exhibits relatively constant resilience and damping characteristics along the diagonals of the gymnastics exercise floor.

[0006] This object is accomplished with the gymnastics exercise floor according to the invention in that the panels in the rectangular subfloor are diagonally arranged.

[0007] The resilience and damping characteristics of the floor are mainly determined by the subfloor. A diagonal arrangement of the panels in the rectangular subfloor ensures that a gymnast performing acrobatic exercises on the diagonals will experience relatively constant resilience and damping characteristics along said diagonals.

[0008] One embodiment of the gymnastics exercise floor according to the invention is characterized in that the springy top layer is arranged in strips on the subfloor, with the strips of the springy top layer including an acute angle with the panels.

[0009] This achieves that joints between the strips of the springy top layer will not coincide with joints between the panels. As a result, the resilience and damping characteristics will vary even less across the area of the gymnastics exercise floor.

[0010] Another embodiment of the gymnastics exercise floor according to the invention is characterized in

that the panels are square in shape.

[0011] Since the length of a square panel equals the width thereof, square panels are relatively easy to install. In addition, the resilience and damping characteristics are relatively constant across the area of one square panel.

[0012] Yet another embodiment of the gymnastics exercise floor according to the invention is characterized in that the panels located on the diagonals of the rectangular subfloor are rectangular in shape.

[0013] Arranging the elongated rectangular panels on the diagonals achieves that the number of joints that adversely affect the characteristics of the subfloor will be relatively small. Moreover, the joints extend transversely to the diagonal in that case, so that the risk of the gymnast landing exactly on a joint is relatively small.

[0014] Another embodiment of the gymnastics exercise floor according to the invention is characterized in that the panel in which the diagonals cross is square in shape.

[0015] The rectangular subfloor is normally square in shape, and a symmetrical subfloor is obtained by arranging a square panel in the centre of the square.

[0016] Yet another embodiment of the gymnastics exercise floor according to the invention is characterized in that the panels are detachably interconnected by means of tongue and groove joints.

[0017] This type of joint makes it easy to join the panels whilst retaining the floor characteristics at the location of the joints.

[0018] Yet another embodiment of the gymnastics exercise floor according to the invention is characterized in that the edges as well as the corners of the rectangular subfloor are provided with end panels that adjoin the panels.

[0019] The end panels provide a smooth transition between an edge of the gymnastics exercise floor and the panel extending at an angle with respect to said edge.

[0020] Yet another embodiment of the gymnastics exercise floor according to the invention is characterized in that the panels are fixed in position in a direction parallel to the diagonal by means of tensioning straps.

[0021] Fixing the gymnastics exercise floor by means of the tensioning straps achieves that forces being exerted on the panels during the acrobatic exercises cannot cause the panels to move relative to each other, as a result of which gaps might form at the joints, which gaps would have a negative effect on the characteristics of the gymnastics exercise floor.

[0022] Yet another embodiment of the gymnastics exercise floor according to the invention is characterized in that the panels are supported by supporting blocks, which supporting blocks are made of at least one layer of open-cell foam and at least one layer of closed-cell foam.

[0023] Open-cell foam has this property that air is forced out of the cells when the gymnastics exercise floor is subjected to a load, and after the load has been relieved the cells are filled with air again on account of the sub-at-

mospheric pressure that prevails therein. As a result of these air flows, the open-cell foam acts like a spring. The closed-cell foam gives the supporting blocks strength. The resilience of the supporting block and thus of the gymnastics exercise floor can be varied by varying the thickness of the layer of the open-cell foam in relation to the closed-cell foam.

[0024] Yet another embodiment of the gymnastics exercise floor according to the invention is characterized in that the top layer is built up of a layer of felt, a layer of hard foam, a layer of soft foam as well as a foam strip, and in that the underlying panels are made of plywood.

[0025] Such a construction of the gymnastics exercise floor provides excellent resilience and damping characteristics for the exercises to be performed on the gymnastics exercise floor.

[0026] The invention will now be explained in more detail with reference to the drawings, in which:

Figures 1-9 are top plan views showing the various steps of the construction of the gymnastics exercise floor according to the invention;

Figures 10a-10c are cross-sectional views of a tongue and groove joint to be used in interconnecting panels;

Figure 11 is a partial cross-sectional view of the gymnastics exercise floor according to the invention.

[0027] Figure 1 is a top plan view, showing a square plane 1, for example measuring 14 metres by 14, as well as the diagonals 2, 3 for the subfloor 40 of a gymnastics exercise floor 50 to be constructed. The diagonals 2, 3 intersect in the centre 4 of the plane 1. A square central panel 5 is placed on the centre 4. The central panel 5 is oriented on the centre 4 of the plane 1 in such a manner that the edges of the central panel 5 extend parallel to the diagonals 2, 3.

[0028] Figure 2 shows a next step of the construction of the subfloor 40 for the gymnastics exercise floor 50 according to the invention. Rectangular panels 8 are placed on the diagonals 2, 3 of the plane 1. The long sides of the rectangular panels 8 are oriented parallel to the diagonal 2, 3 on which the panel 8 in question is placed.

[0029] Once the rectangular panels 8 have been placed, square panels 10 are placed in the four triangular parts of the plane 1 that are formed by the rectangular panels 8 (figure 3). The edges of the square panels 10 are oriented parallel to the diagonals 2, 3.

[0030] As figure 4 shows, corner panels 15 and end panels 16 are joined to the outer edges 14 of the diagonally arranged panels 5, 8, 10 so as to finish a square subfloor 40. Four corner panels 15 are arranged in the corners of the plane 1, with the end panels 16 being arranged between said corner panels. The outer edges 14 of the rectangular panels 8 abut against the corner panels 15 as well as against two end panels 16. The outer edges 14 of the square panels 10 abut against two respective

end panels 16. The corner panels 15 are hexagonal in shape, whilst the end panels 16 are square. The corner panels 15 and the end panels 16 can be secured to the bottom on which the gymnastics exercise floor 50 is placed.

[0031] The panels 5, 8, 10, 15, 16 are joined together by means of tongue and groove joints. The tongue and groove joint 60 will be explained in more detail with reference to figures 10a-10c.

[0032] After the panels 5, 8, 10, 15, 16 of the subfloor 40 have been joined together, the panels 5, 8, 10, 15 are fixed in position by means of tensioning straps 20. The tensioning straps 20 prevent the panels 5, 8, 10, 15, 16 of the subfloor 40 from moving relative to each other (figure 5a).

[0033] Figure 5b shows the encircled part Vb of the subfloor 40 of figure 5a, showing in top plan view parts of the panel 8, the corner panels 15 and the end panel 16. The tensioning straps 20 can be tensioned by means of tensioning devices 21 on the corner panels 15 (or the end panels 16). The tensioning strap 20 that is shown in figure 5b extends from the tensioning device 21 through a first opening 22 and a second opening 23 in the corner panels 15, and further over the panels 8, 5, 8 to the corner panel 15 that is located diametrically opposite thereto.

[0034] Figure 5c is a cross-sectional view of the corner panel 15 along the line I-I in figure 5b. The tensioning strap 20 comprises a hook 24 at an end remote from the tensioning device 21. The hook 24 of the strap 20 is first passed through a first opening 25 and then into a second opening 26 in the end panel 15 and fixed to the corner panel 15.

[0035] Figure 6 shows the subfloor 40 of the gymnastics exercise floor 50 according to the invention as fixed by means of the tensioning straps 20.

[0036] Figure 7a shows the subfloor 40 of the gymnastics exercise floor 50 according to the invention provided with a rim 30. Figure 7b shows the manner in which the rim 30 is fitted to the corner panels 15 and the end panels 16 by means of a tensioning strap 31 and tensioning means 32.

[0037] Figure 8 is a top plan view of the final subfloor 40 of the gymnastics exercise floor 50 according to the invention.

[0038] After the subfloor 40 has been built up, a top layer (not shown) in the form of strips of a compressible foam is provided. The foam strips are arranged at an angle with respect to the panels 5, 8, 10. When such an orientation of the foam strips with respect to the panels 5, 8, 10 is used, the joints between the strips and the joints between the panels 5, 8, 10 cannot coincide. In principle, the strips can be rolled out over the panels in a conventional manner, parallel to the edges of the gymnastics exercise floor, in which case the diagonally arranged panels 5, 8, 10 will include an angle of approximately 45° with the strips. The top layer is provided with a carpet 51 (figure 9), which carpet 51 of the top layer will be provided with lines 52 for the match.

[0039] Figures 10a-10c are cross-sectional views of a tongue and groove joint 60 of two panels 5, 8 that are to be joined. Figures 10a and 10b show the separate parts of a tongue and groove joint 60, whilst figure 10c shows a tongue and groove joint 60 in assembled condition.

[0040] Figure 10a shows the panel 5, in an opening of which a threaded bush 61 is fixed. The bush 61 comprises a flange 62 that abuts against the surface of the panel 5 that is to be provided with a top layer. A tongue 63 is positioned against the panel 5. The tongue 63 is provided with an opening 64. The opening 64 may also comprise a threaded bush. The opening 64 is aligned with the bush 61, after which a bolt 65 is screwed into the screw thread of the bush 61. The flange 62 of the bush 61, which extends over the surface of the panel 5, makes it possible to attach the tongue 63 and the panel 5 firmly together by means of the bolt 65. One end of the tongue 63 is provided with a bevelled portion 66.

[0041] Figure 10b shows a panel 8, in which a bush 70 similar to the bush 61 is fixed. A spacer 71 and a plate 72 are positioned against the panel 8. The spacer 71 as well as the plate 72 are provided with an opening 73, 74. The bush 70 is aligned with the openings 73, 74, after which a bolt 75 is screwed into the threaded bush 73 openings 73, 74, thus pressing the panel 8, the spacer 71 and the plate 72 firmly together. The openings 73, 74 may also be provided with screw thread. As a result of the presence of the spacer 71, a groove 80 is obtained between the panel 8 and the plate 72.

[0042] Figure 10 c shows the panels 5, 8 that have been joined together by means of the tongue and groove joint 60. The tongue 63 is inserted into the groove 80 by moving the panels 5, 8 together. As the figure shows, the tongue 63 is accommodated in the groove 80 with some play 81. When a force is exerted on a joint 82 between panels 5, 8, the tongue and groove joint 60, in particular the bevelled tongue 63 that is inserted into the groove 80 with some play 81, ensures that the resilience and damping characteristics of the subfloor 40 near the joint 82 are substantially the same as on the panel 5, 8.

[0043] Figure 11 is a cross-sectional view of the gymnastics exercise floor 50 according to the invention. The subfloor 40 is supported by supporting blocks 90. The subfloor 40 is preferably made of plywood. A supporting blocks 90 is made of at least one layer of open-cell foam 91 and two layers of closed-cell foam 92 disposed on either side of the layers of open-cell foam. When the gymnastics exercise floor 50, and thus the layer of open-cell foam 91, is subjected to a load, air is forced out of the cells 93. After the load has been relieved, a sub-atmospheric pressure prevails in the cells 93, causing the cells 93 to be filled with air again. The air flow caused by subjecting the foam 91 to a load and relieving said load again provides some kind of spring action. The resilience characteristics of the supporting block 90 can be varied by varying the thickness of each layer 91, 92.

[0044] Preferably, the top layer 95 comprises a number of layers: two compressible foam layers 96 on top of the

subfloor 40, a carpet 51 provided with a strong, hard foam layer 97 as well as a soft foam layer 98 and a layer of felt 99, preferably seam felt.

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Claims

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1. A gymnastics exercise floor comprising a rectangular subfloor provided with panels, on which panels a compressible top layer is provided, **characterized in that** the panels in the rectangular subfloor are diagonally arranged.

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2. A gymnastics exercise floor according to claim 1, **characterized in that** the top layer is arranged in strips on the subfloor, with the strips of the top layer including an acute angle with the panels.

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3. A gymnastics exercise floor according to claim 1 or 2, **characterized in that** the panels are square in shape.

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4. A gymnastics exercise floor according to any one of the claims 1-3, **characterized in that** the panels located on the diagonals of the rectangular subfloor are rectangular in shape.

30

5. A gymnastics exercise floor according to claim 4, **characterized in that** the panel in which the diagonals cross is square in shape.

35

6. A gymnastics exercise floor according to any one of the preceding claims, **characterized in that** the panels are detachably interconnected by means of tongue and groove joints.

40

7. A gymnastics exercise floor according to any one of the preceding claims, **characterized in that** the edges as well as the corners of the rectangular subfloor are provided with end panels that adjoin the panels.

45

8. A gymnastics exercise floor according to any one of the preceding claims, **characterized in that** the panels are fixed in position in a direction parallel to the diagonal by means of tensioning straps.

50

9. A gymnastics exercise floor according to any one of the preceding claims, **characterized in that** the panels are supported by supporting blocks, which supporting blocks are made of at least one layer of open-cell foam and at least one layer of closed-cell foam.

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10. A gymnastics exercise floor according to any one of the preceding claims, **characterized in that** the top layer is built up of a layer of felt, a layer of hard foam, a layer of soft foam as well as a foam strip, and **in that** the underlying panels are made of plywood.

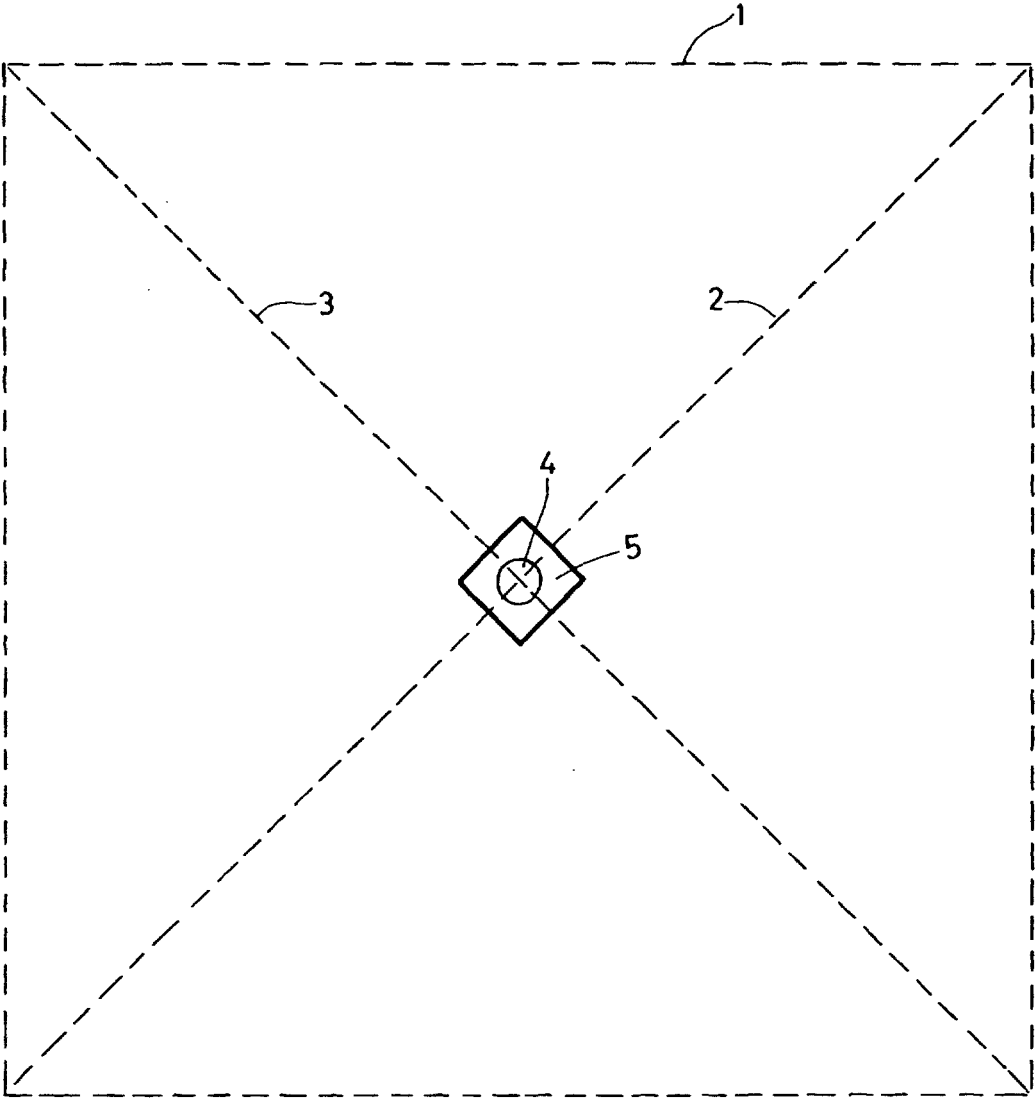


FIG. 1

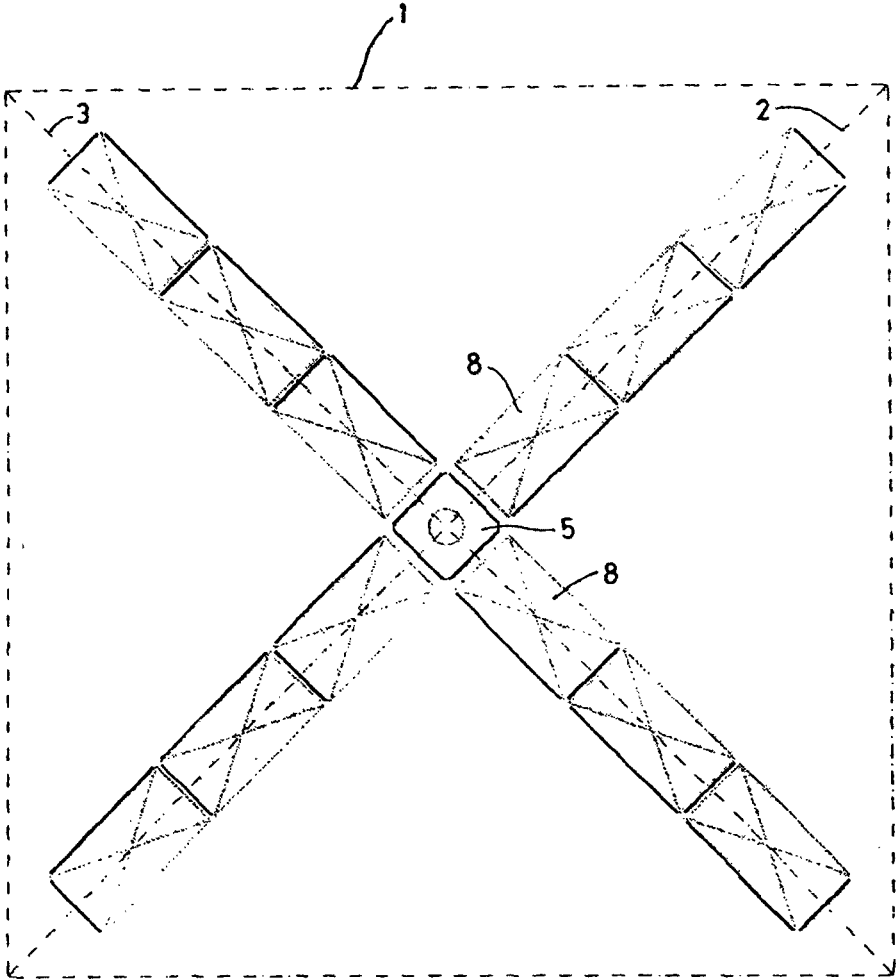


FIG. 2

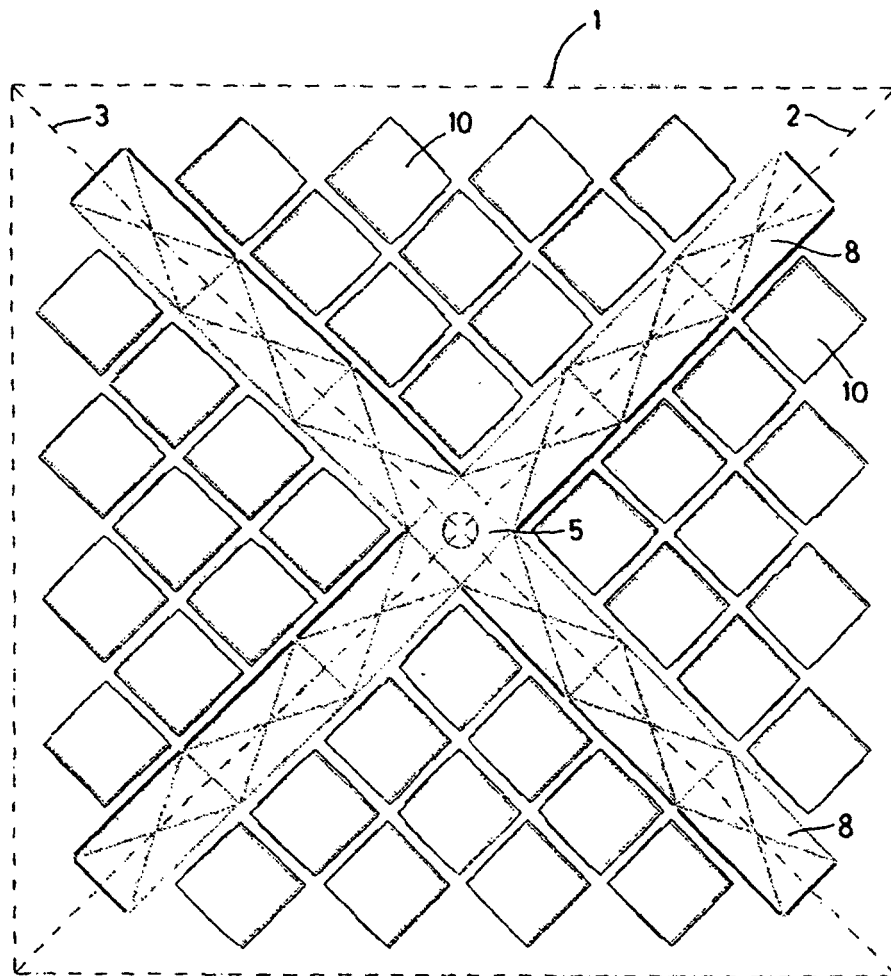


FIG. 3

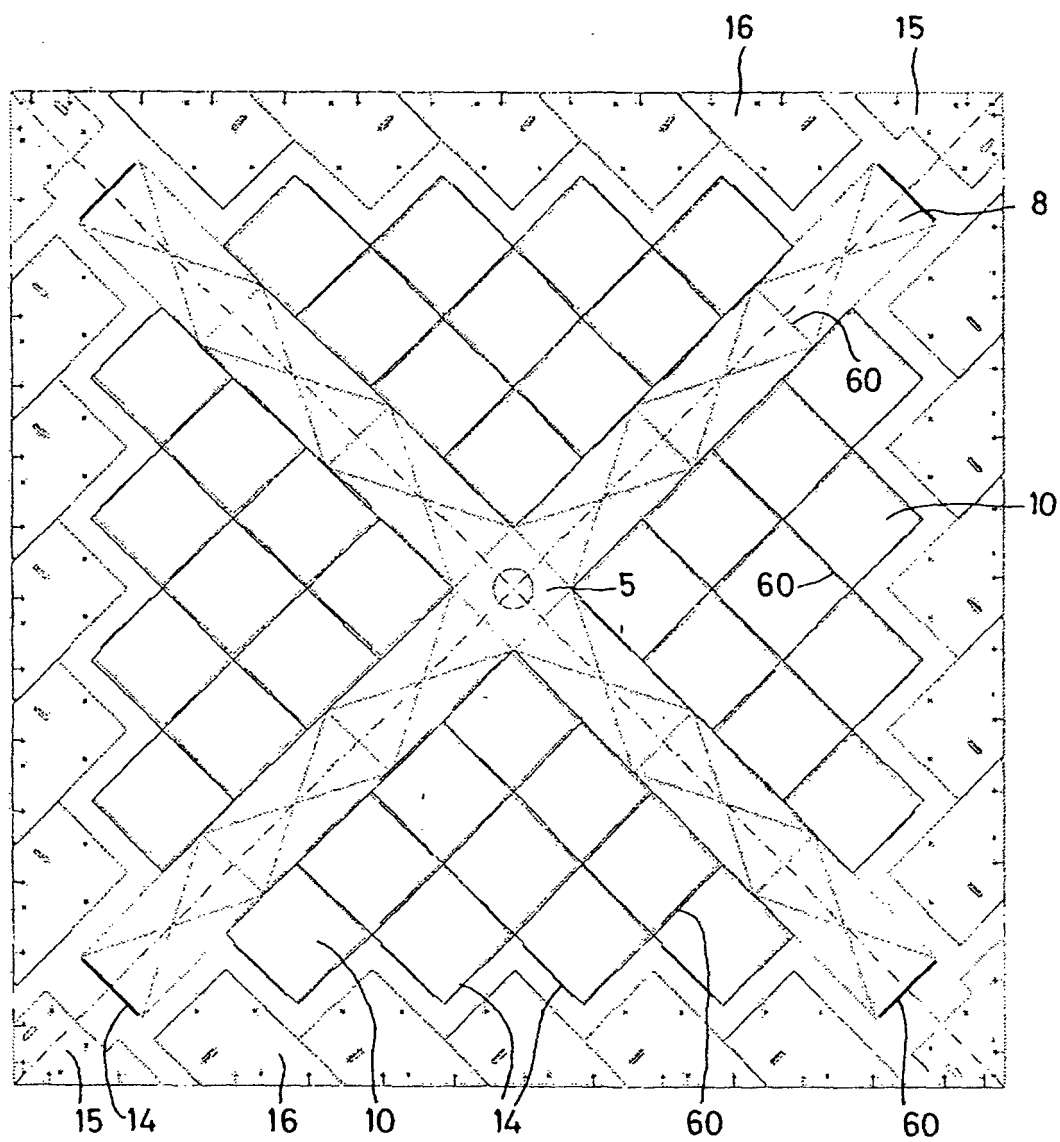


FIG. 4

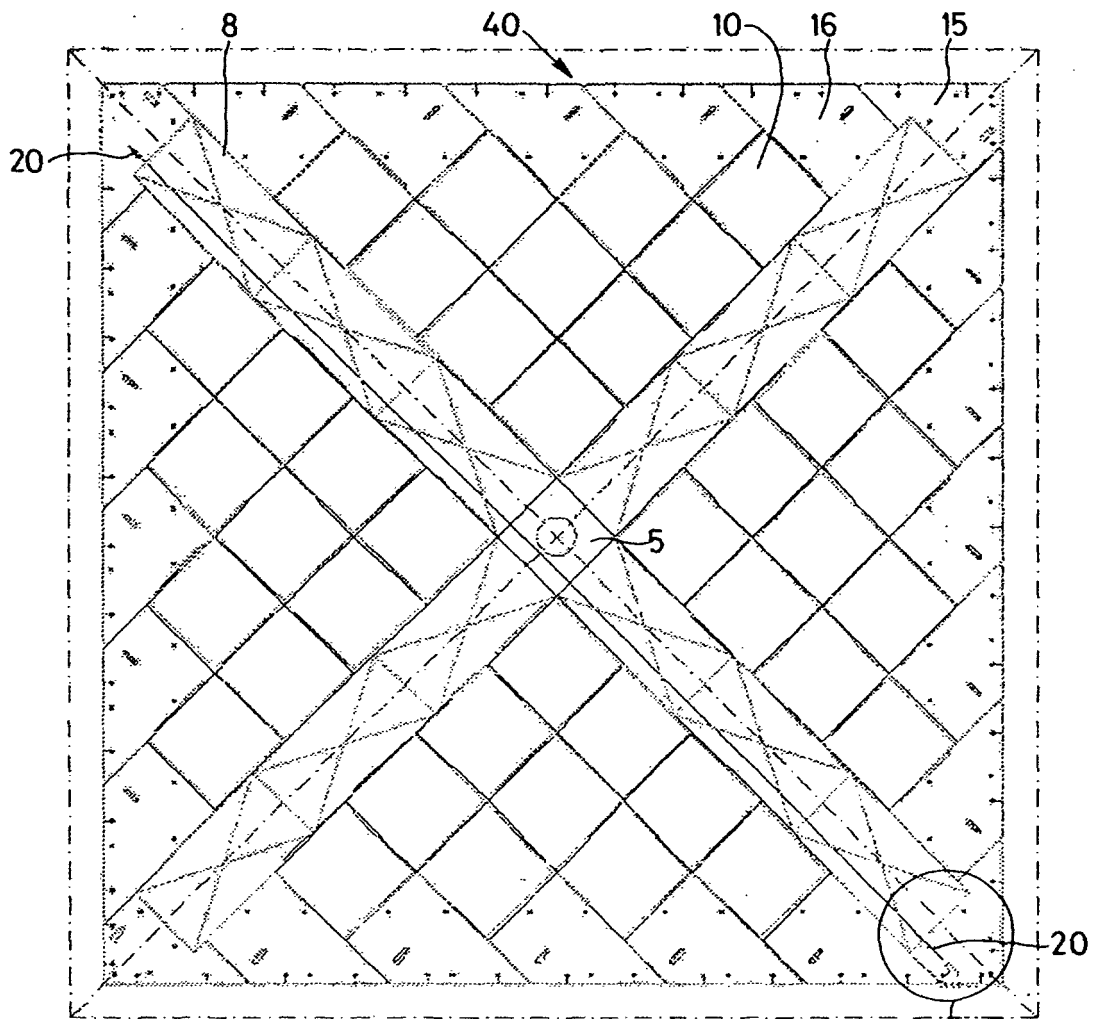


FIG. 5a

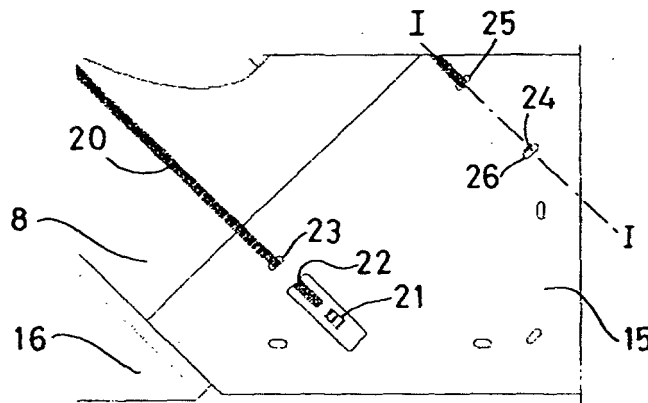


FIG. 5b

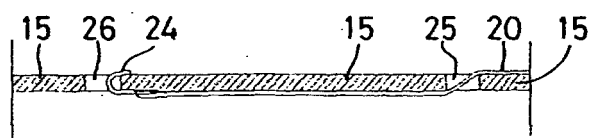


FIG. 5c

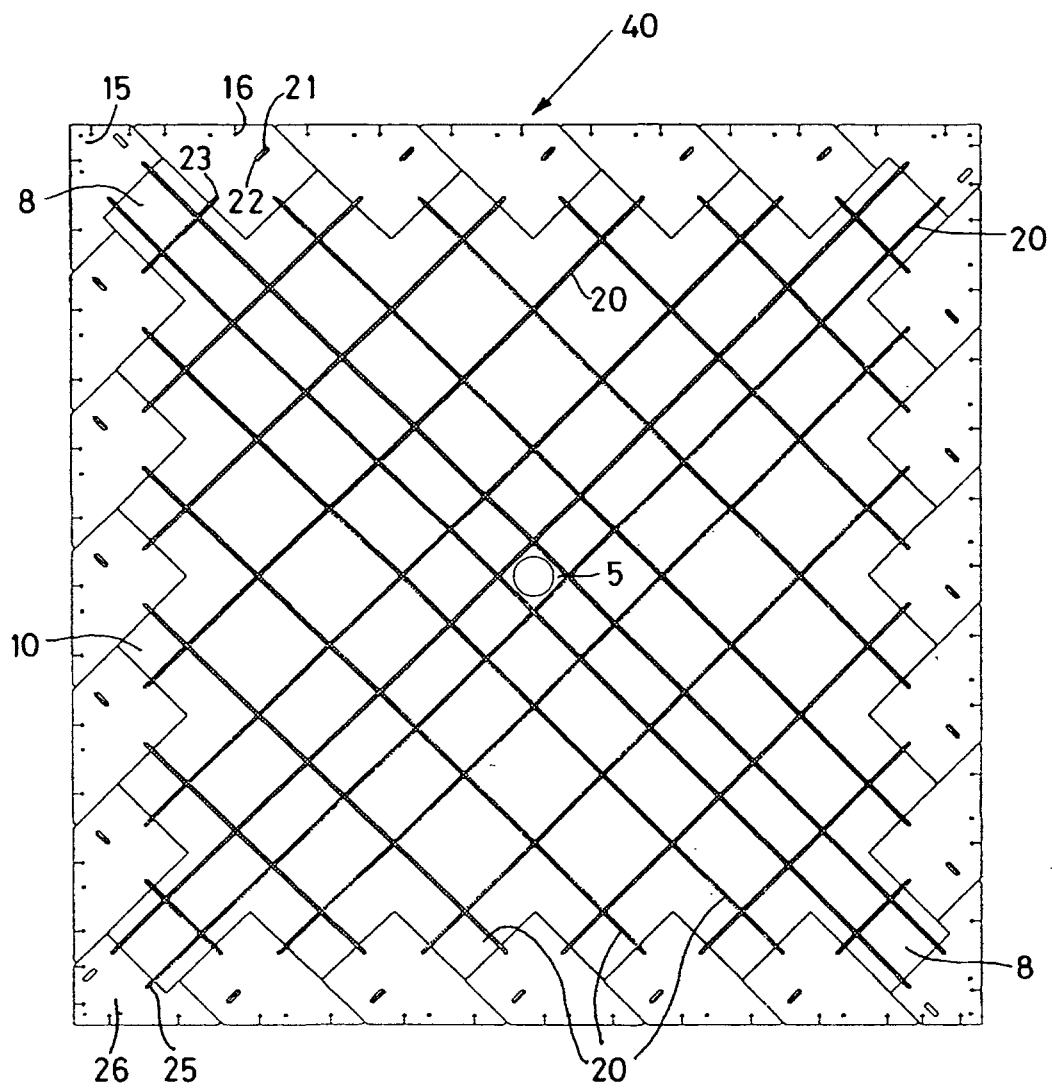


FIG. 6

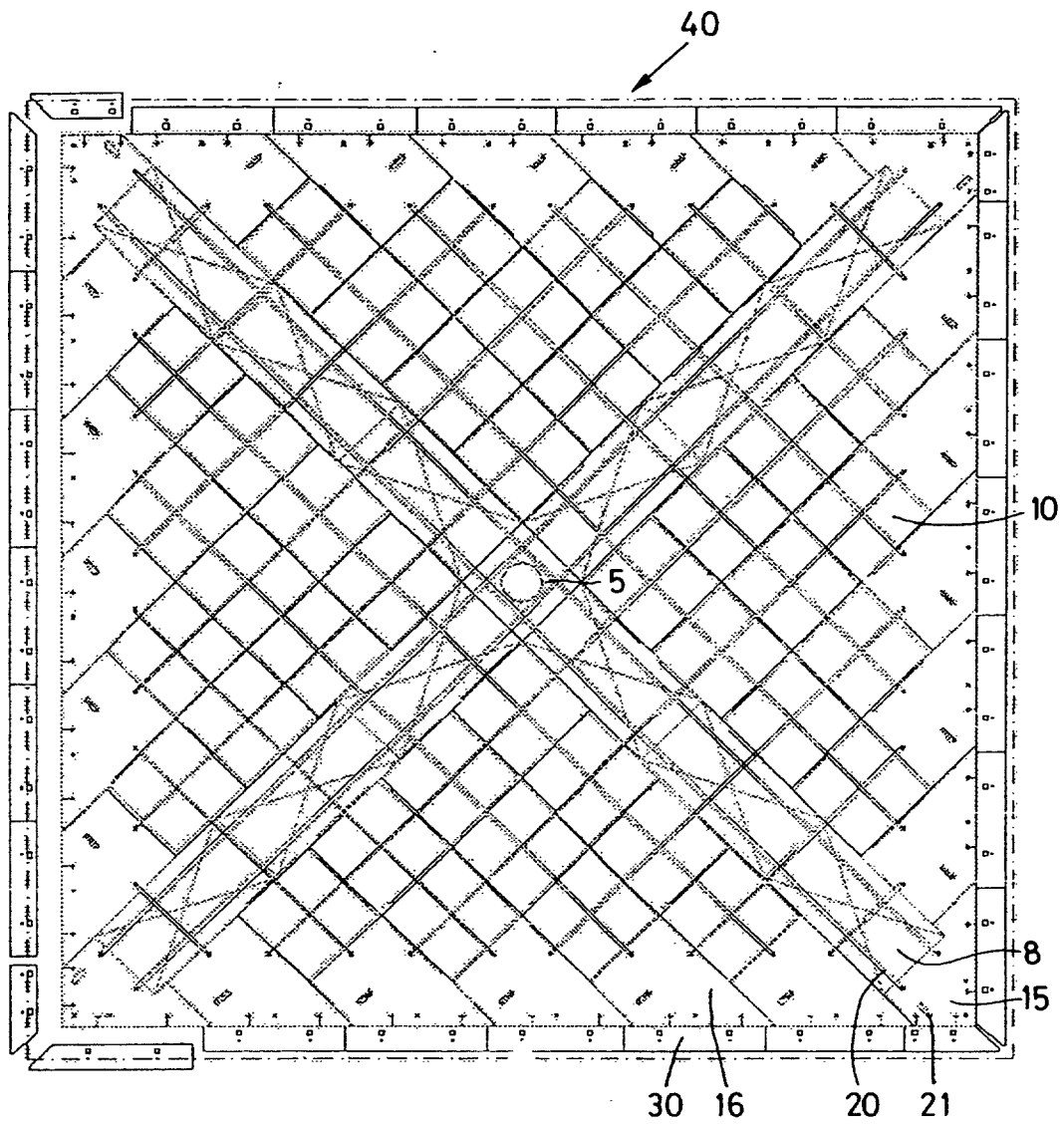


FIG. 7a

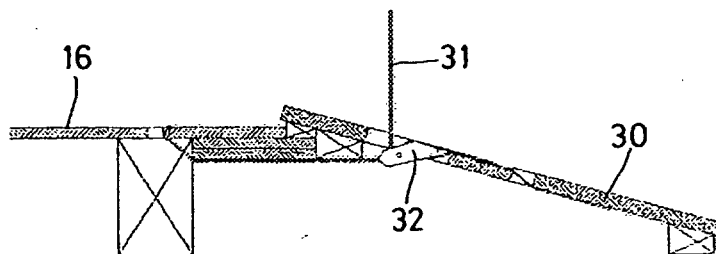


FIG. 7b

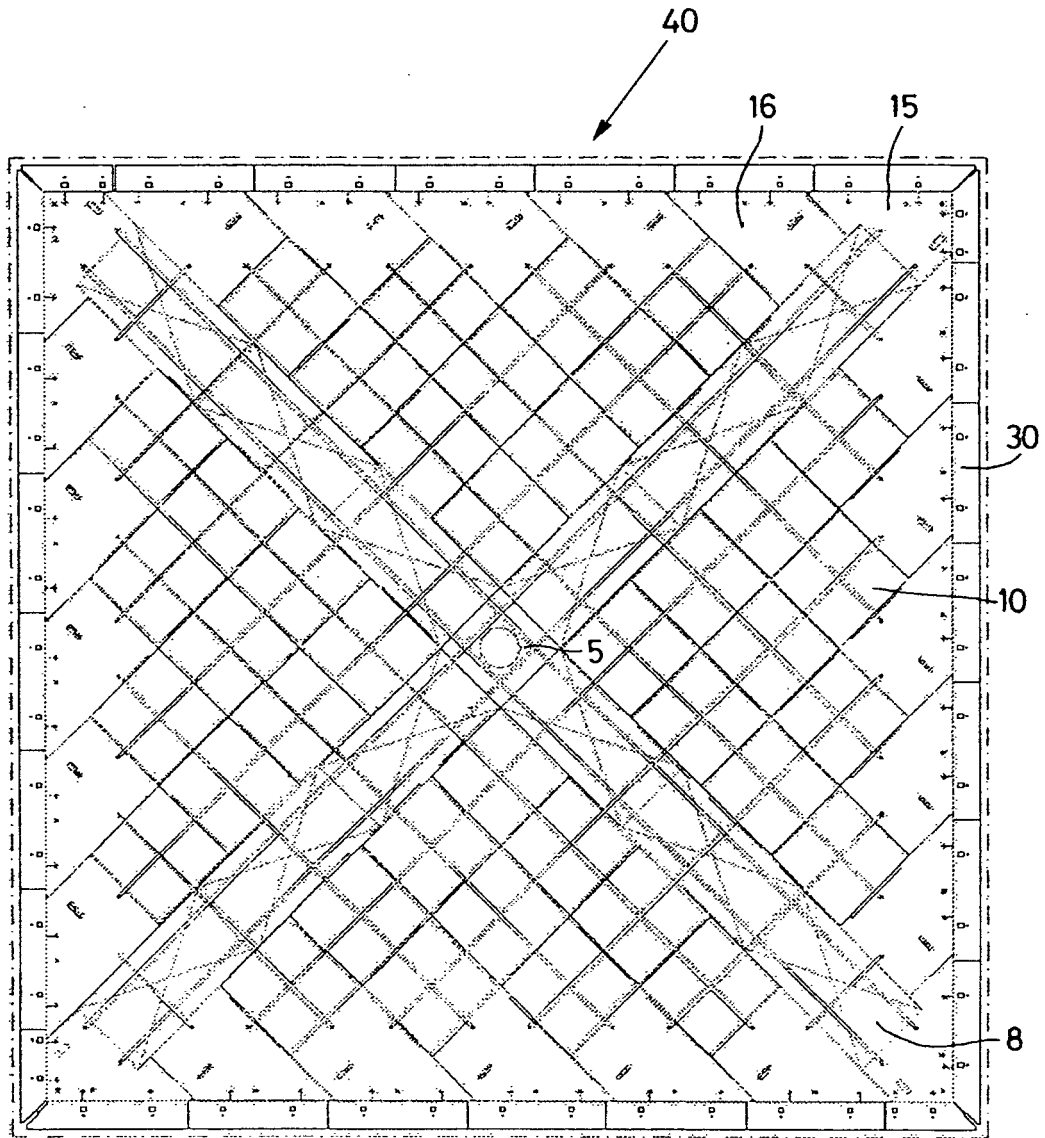


FIG. 8

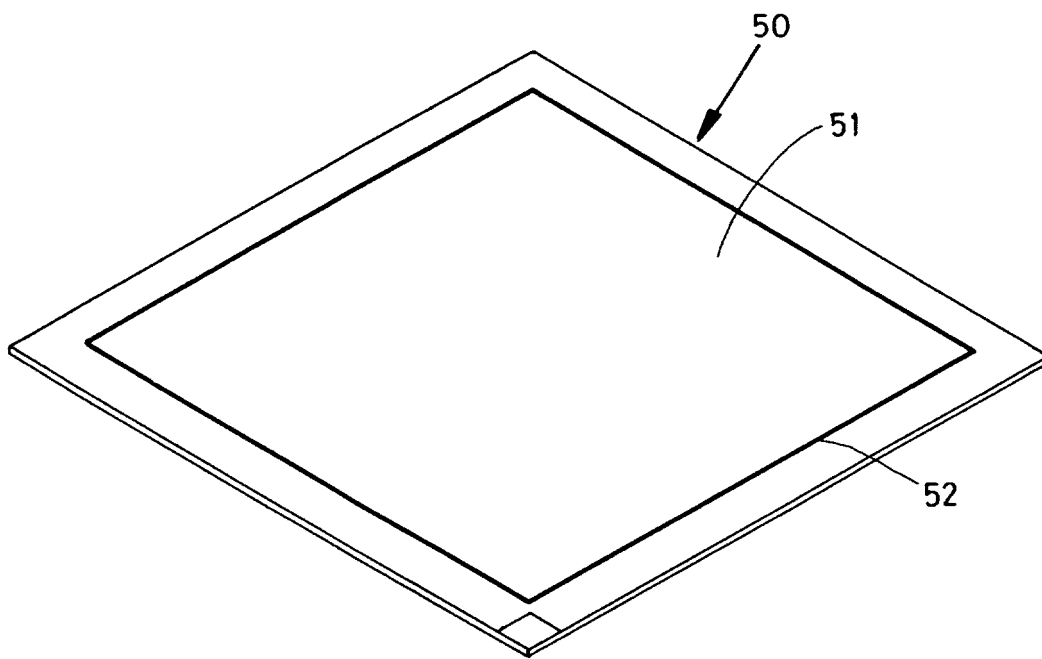


FIG. 9

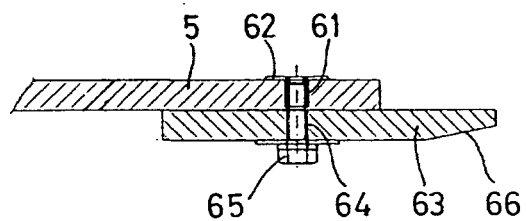


FIG. 10a

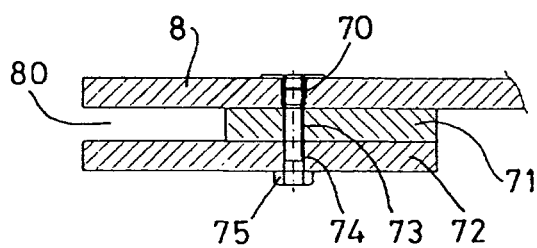


FIG. 10b

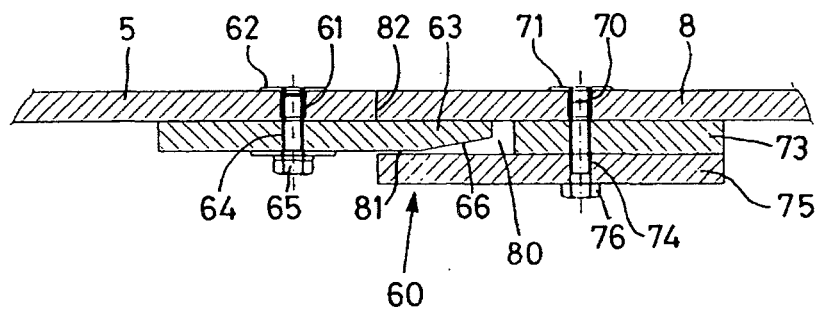


FIG. 10c

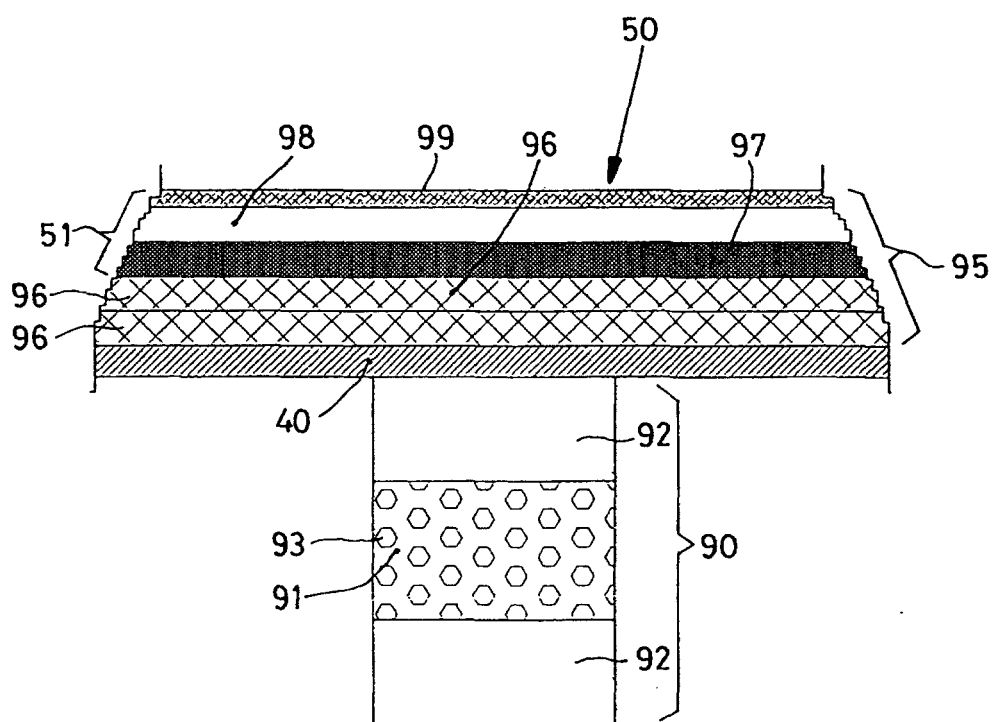


FIG.11



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.7)
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A	EP 0 511 709 A (RUBET INT BV) 4 November 1992 (1992-11-04) * claim 1; figure 2 *	1,3	
P,A	ANONYMOUS: "Free exercise floor 'Extra Dynamic' Ref. 1790300" INTERNET ARTICLE, [Online] 2003, XP002348034 Retrieved from the Internet: URL:http://www.janssen-fritsen.com/dynamic-floor.asp> [retrieved on 2005-10-06] * the whole document *	1-10	
A	GYMNOVA: "Catalogue 2003" 2003, ZEN STUDIO , FRANCE , XP002348071 * page 28 - page 30 *	1-10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A63C E01C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 October 2005	Examiner Murer, M
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