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(54) **Safety stair mat for children learning to walk**

(57) Disclosed is a safety stair mat particularly designed for protecting children of the age of 1~4 from possible injury when they are learning to walk and they fall down the stairs. The safety stair mat is made of a soft and shock resistive material, and is intended to be either laid on the steps of the stairs in a manner to cover the edges of the steps, or to be laid on the stair landing, or to be laid on the ground at the base of the staircase as a ground mat, so as to alleviate fatal impingement imposed on the children's bodies with its cushioning ef-

fect. Connection means are provided to the edges of each mat for connecting said each mat with adjacent mats so that the size of the mat can be unlimitedly extended to meet the actual requirements. The installation can be easily performed by the user in DIY mode without the need for any extra tools. Bonding of the mat with the steps of the stairs is carried out by a double-sided adhesive binder tape provided on the bottom surface of the mat that not only facilitates installations but also replacement.

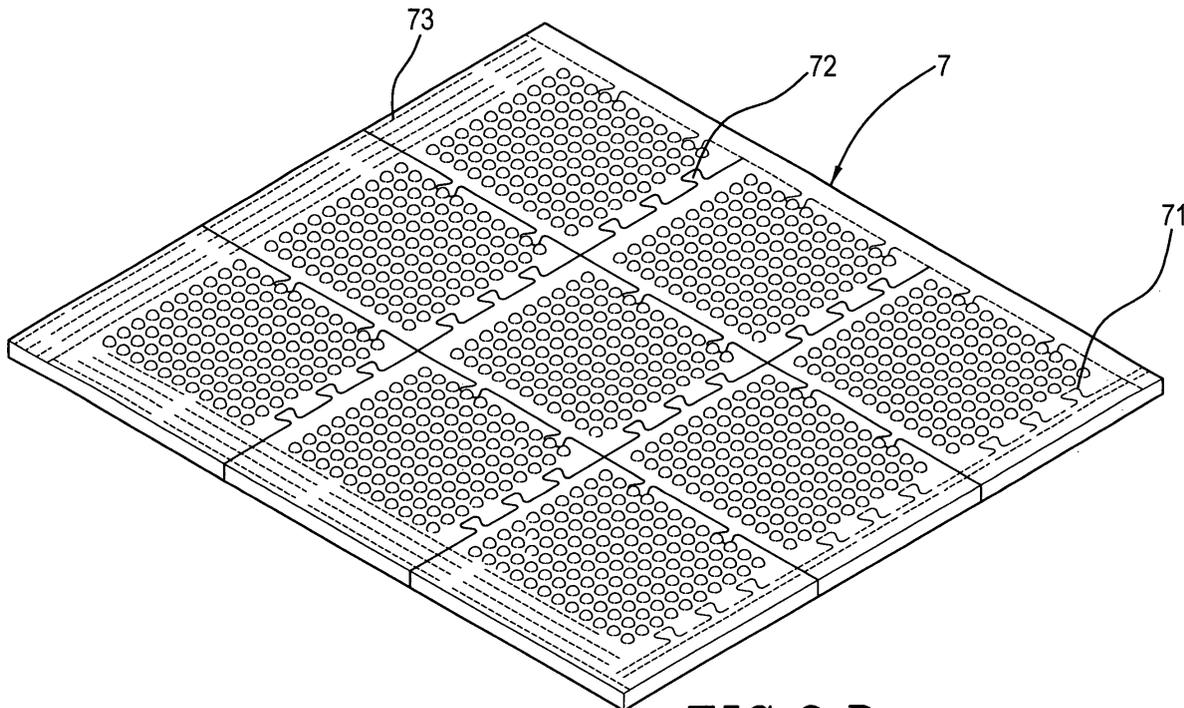


FIG.3 D

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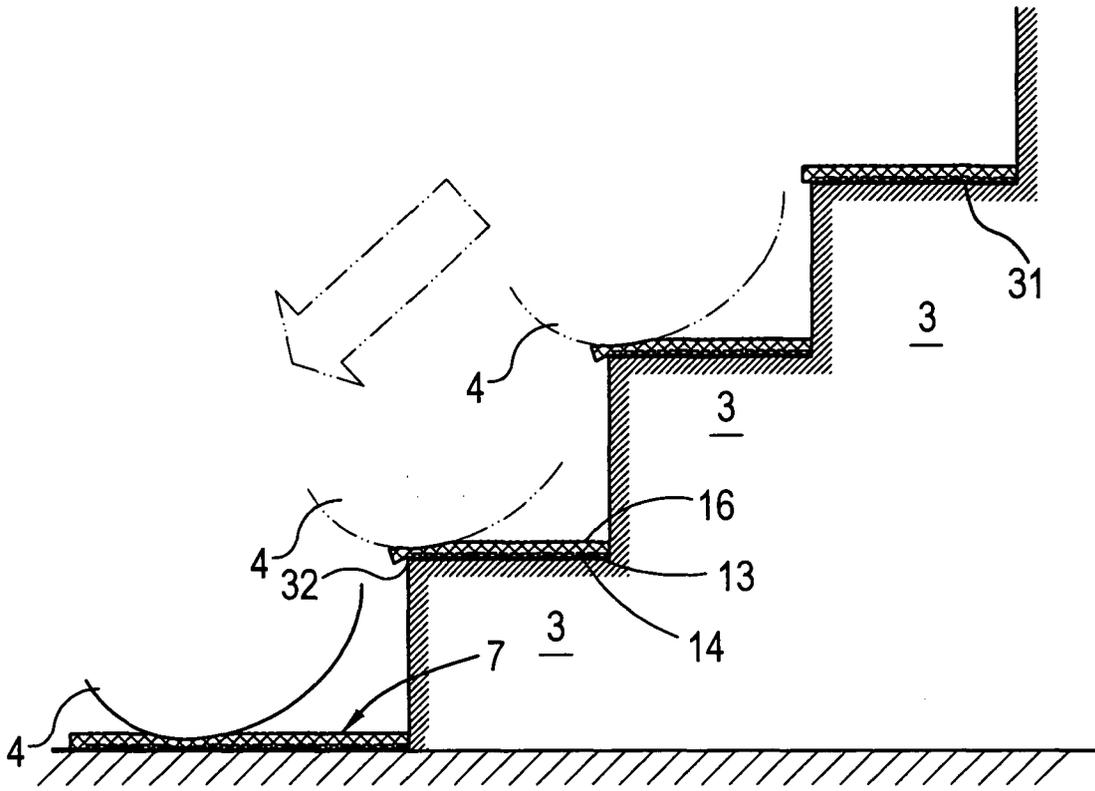


FIG. 5 A

Description**BACKGROUND OF THE INVENTION****1. Field of the invention**

[0001] The present invention relates to safety stair mat, and more particularly, to a safety stair mat prepared for children at the age of 1 to 4 by adhesively laid on the stair steps and the stair landing of a staircase so as to protect or alleviate impinge on aforesaid children with its cushioning effect in the case they tumble down when learning to walk along the staircase.

2. Description of the Prior Art

[0002] The staircase is a requisite structure for a multiple story building, but it is one of the places where accident is frequent. There have been a lot of protective facilities for adults against generally probable accident apt to happen on a staircase, but none of them are specially aimed at protection for children learning to walk.

[0003] Generally, the essential functions for a safety stair mat are slip-resisting, tumbling protection, sound absorption, and edge enclosing. Among which sound absorption and tumbling protection seem to be no direct relationship with the children learning to walk by reason that a child of age 1~4 weighing about 10kg usually does not make loud noise when walking up and down the stairs as that is the case of an adult with a weight of 60~70kg. As for tumbling protection, an aforementioned child when falling down from topmost story is no ability of self-rescue as to hold onto the tumbling protection facility such as the staircase railing as that the adult is able to unconsciously do. In view of this, above mentioned protection facilities are of no use for children who are learning to walk.

[0004] Another staircase protection product, for example, is an enclosing mat using a soft material to cover the edge and acute part of the stairstep in the manner slightly protruding upward so as to try to attain the purpose of tumbling protection and alleviating impinge force of the edge or acute angle of the stair on the human foot. Such a protection mode may be effective to an adult but of no use to an above said child because the child usually does not go step by step orderly when climbing up and down the stairs as the adult, instead, leaping in a rather disorder and staggering way, in case when his/her foot just stumbles on the protruded portion of the stair edge, an immediate hazard might occur.

[0005] Still another staircase protection product for example, is a 90° degree flexed soft material to construct an enclosing mat for covering the acute angle of the stair, such a protective facility may, of course, protect injury to a child to a certain extent, but an inevitable reaction force exerted upon the child's body when tumbling down still might incur an unbearable ache to the child. In the meanwhile, a protective mat to protect

merely the steps of a staircase is not secure enough for a child learning to walk since when tumbling down from an upper story, such a child is likely to fall down at least to a landing of the lower section of the staircase, at worst, directly dash down to the ground of the staircase.

[0006] Meanwhile, some of the protective mats are fixed to the stairsteps tediously by drilling tapped holes for screw engagement, or alternatively adheres to the stairsteps with a handy binder, in the latter case, there arises a problem of difficulty in peering off for replacement.

[0007] Meanwhile, standardizing the size for conventional protective mats is almost impossible as there are variety of staircase sizes both for public buildings and private residential houses. The installation of protective mat must rely on the skilful workmen using extra tools to cut and trim the mat into specially required size to meet a particular case that calls for much labor and the installation cost must be expensive.

[0008] In order to palliate the shortcomings inherent to the conventional safety stair mat described above, the present inventor has delved into this matter with long time intensified efforts and has come to realization of the present invention.

SUMMARY OF THE INVENTION

[0009] It is a first object of the present invention to provide a safety stair mat for the family having a child (or children) of age 1~4, to be tentatively installed on the house staircase for the child (or children) to learn walking thereon without causing injury when stumbling or falling down.

[0010] It is a second object of the present invention to provide a safety stair mat which has a sufficient thickness, softness and shock resist property so as to alleviate the child (or children)'s pain when tumbling on the staircase.

[0011] It is a third object of the present invention to provide a safety stair mat which is easy to install and detach so as to save the installation and maintenance cost yet substantially practical for children to learn walk thereon.

[0012] It is a fourth object of the present invention to provide a safety stair mat which can protect the edge of the stairsteps, and can be laid as a ground mat on the stair landing of each section of the staircase, or on the base ground of the staircase so as to protect the child who tumbles down from the topstory directly to the base ground in the manner colliding with the edges of successive stairsteps.

[0013] It is a fifth object of the present invention to provide a safety stair mat which is easy to install by means of DIY without the aid of skilful workers so as to save installation cost. Besides, this stair mat should be compatible with various different sized stairsteps by freely extending or diminishing its size.

[0014] For achieving these and other objects men-

tioned above, the safety stair mat of the present invention is made to have separable and connectible edges so as to be extended to any desired size to match the size of existing stairsteps. The material thereof can be conveniently cut with an ordinary knife. The top surface thereof consists of a soft layer with a definite thickness, and is provided with a plurality of slip resistive protuberances, while the bottom portion is padded with a shock resistive layer to absorb impact force. A two-face industrial binder tape consisting of a film formed of a non-woven cloth, cotton or other tough materials is adhered to its bottom surface for the convenience of installation and replacement. The mat is laid over each stairstep in the manner emerging approximately 1~1.5 cm forwards of the step edge so as to alleviate the impact force. This emerged portion of the mat does not cause the child to stumble over as the average length of a child's foot is about 10~12 cm. The safety ground mats are further laid both on the stair landing of each section of the stair case, and the base ground of the staircase so as to protect the child from severe injury or pain who tumbles down from the top story until the base ground in the manner colliding with the edge of each stairstep successively.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] For fuller understanding of the nature and objects of the invention, reference should be made to the following detailed description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of the present invention;
 Fig. 2A is a top view of the present invention;
 Fig. 2B is a bottom view of the present invention;
 Fig. 2C is a schematic view of the two-faced industrial binder tape adhered to the bottom surface of the present invention;
 Fig. 3A is a schematic view illustrating means for connecting and extending the safety stair mat of the present invention;
 Fig. 3B is a schematic view illustrating how the two mats are connected together;
 Fig. 3C is a schematic view showing two mats are connected together;
 Fig. 3D is a schematic view showing a large ground mat which is composed of a plurality of unit ground mats;
 Fig. 3E is a schematic view showing another type of a large ground mat composed of a plurality of unit ground mats;
 Fig. 4A and 4B are schematic views illustrating how safety stair mat is installed on the stairsteps; and
 Fig. 5A and 5B are schematic views illustrating how the safety stair mat of the present invention protects the child who is tumbling down along a staircase.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] For understanding the structure, nature, features and installation of the safety stair mat according to present invention, reference should be made to Figs. 1 to 4B, a soft material severable with an ordinary knife is used to construct the mat. As shown in Fig. 2A, a soft planar top surface 11 of the mat 1 has a plurality of small slip resistive protuberances 16, while a bottom surface 12 of the mat 1 is provided with a plurality of round recesses 14 each associated with a shock resistive stud 13 so as to alleviate an impact force exerted upon the mat 1. Alternatively, the studs 13 can be directly formed on the bottom surface 12 thereof to omit formation of the recesses 14 without losing shock resistive effect of the mat 1. (see fig. 2B). Several scored lines 15 are intermittently formed along the fringe of mat 1, some of the scored lines 15 are cut through the bottom surface 12 such that the user may cut the rest of unsevered portion along the scored lines 15 with a knife in DIY mode. There is a plurality of mortises 17 formed along one edge of the mat 1, while corresponding number of tenons 18 is formed on the opposite edge, the tenons 18 and mortises 17 are both formed through overall thickness of the mat 1 from its top surface 11 to the bottom surface 12. When assembling, the dummy portion of the mat 1 which emerges out of the stairstep can be removed by cutting the mat 1 along an appropriate scored line 15. Should an unit of mat 1 is not enough to cover the entire stairstep 31, an extension mat 6 (see Fig. 3A) can be additionally connected to the mat 1 so as to enlarge the total area of the conjoined mat. Similar to the mat 1, the extension mat 6 has a plurality of tenons 61 on one edge and corresponding number of mortises 61 on the opposite edge, and several intermittently scored lines 63 preformed along the longitudinal and transverse edges thereof. Except the size and outer appearance are slightly different with each other, the overall structure from top to bottom for the mat 1 and extension mat 6 is identically constructed. The connection between mat 1 and extension mat 6 is preformed by coupling the tenons 61 (or mortises 62) of the extension mat 6 with the mortises 17 (or the tenons 18) of the mat 1 as shown in Figs. 3B and 3C. Further extension of the mat 6 can be continued in the manner described above.

[0017] Returning to see Fig. 2C, a two-face industrial binder tape 2 consisting of a film 21 formed of a non-woven cloth or other tough materials is adhered one face to the bottom surface 12 of the mat 1, the binder tape 2 is used to adhere the bottom surface 12 of the mat 1 onto the stairstep 31 of a staircase 3 after peering off the barrier paper 5 which is ordinarily adhesively covering on the other face of the binder tape 2. The edge of the mat 1 is emerged out of the edge 32 of the staircase 3 about 1 ~ 1.5 cm thereby completely protecting the edge 32 of the staircase 3 (see Figs. 4A~4B). By doing so the severe injury to the child when colliding his/

her body with the edge 32 can be minimized, and the accompanied pain may also be reduced. As described above, the mat 1 can be easily trimmed neatly by the user using an ordinary knife therefore achieving the purposes of both safety and good looking.

[0018] Returning to Fig. 1, a ground mat 7 is constructed to have a completely similar structure of top and bottom surfaces as the top surface 11 and bottom surface 12 of the mat 1. The ground mat 7 is made far larger in size compared to the stairstep mat 1 but have the similar scored lines 71, and a plurality of tenons 72 and mortises 73 along the edges serving as connection means to expand its area to a desired size (see Figs. 3C to 3E) for preventing injury to the child who falls down from upstairs.

[0019] For understanding how the safety stairmat of the present invention protects the child who is tumbling down along a staircase, reference should be made to Figs. 5A and 5B. In Fig. 5A, the dotted line and the virtual line represent the locus of the child 4 falling down from one of the stairstep 3 down to the ground mat 7. Obviously the child 4 is well protected from direct collision with the stairstep edge 32 by 1~5cm emerged portion of safety mat 1, while the impact force of direct hit to the ground is alleviated by the softness of the top surface 11, and the shock resistive property of the bottom surface 12 provided by the ground mat 7.

[0020] By the way, said safety mat 1 may be made integrally in one piece of EVA foaming substance (vinyl acetate resin) or combined with two materials with a thickness of 1.5~2cm. The top soft layer may be formed of EVA foaming substance, while the bottom layer may be formed of shock resistive and easily severable rubber foaming substance, plastic foaming substance, or resin foaming substance.

[0021] Alternatively, the safety stair mat of the present invention may directly use a shock resistive or soft substance to form the bottom surface 12 without preparing any cushion structure on the bottom surface, or it may be formed of more than two soft and shock resistive materials.

[0022] It can be seen from the above description that the safety stair mat for children learning to walk according to the present invention has several noteworthy advantages over the conventional products, ie:

1. The present invention is especially designed for children of age 1 to 4 and is a tentative facility to be installed in a residential housing staircase. A two-face binder tape consisting of a tough unbreakable film adhered to the stairsteps makes the installation and replacement easy to carry out in a very short time compared to the conventional product.
2. The mat can be practically severed in comply with any existing staircase size with an extension of 1~1.5cm at the step edge so as to furnish protection means for collision and eliminate problematic danger which would otherwise be brought about by

sharp step edge. It also rectifies 90° degree protection design reaction force which may be exerted to the falling down children resulting in lessening their pain.

3. The present invention provides wide range of effective protection from the children's collision with step edges up to falling onto the ground by combined installation of the soft slip resistant stair and ground mat. The softness of the mat is verified by dropping an egg from 1.2 meter height above the ground down to the mat without any track of cracking, not to say complete breakage.

4. The safety mat of the present invention provides protection for the children who have no self-rescue ability from falling down to the staircase landing and to the base ground so as to assure all directional protection.

5. The present invention provides a DIY product which can be severed with an ordinary knife by the user. The length of mat can be extended unlimitedly thus applicable for various stairsteps of the width more than 65cm. The frangible and extendable mat design serves the user to be able to assemble the mat in a very short time without the aid of the skillful worker.

[0023] Those who are skilled in the art will readily perceive how to modify the invention. Therefore, the appended claims are to be construed to cover all equivalent structures which fall within the true scope and spirit of the invention.

Claims

1. Safety stair mat for children learning to work comprising:

a stair mat 1 having a top surface 11 and a bottom surface 12, wherein said top surface 11 is formed with soft material to alleviate impact force, and a plurality of small slip resistive protuberances 16 is formed thereon, while said bottom surface 12 is provided with a plurality of shock resistive studs 13;

several scored lines 15 intermittently formed along the fringe of said mat 1 for cutting to remove the dummy portion of said mat 1;

a plurality of mortises 17 formed along one edge of said mat 1, and corresponding number of tenons 18 formed on the opposite edge usable for connecting means with adjacent mat 1; a two face binder tape 2 adhered its one face to said bottom surface 12 of said mat 1, when installing said mat 1 on a stairstep 31 of a staircase 3, a barrier paper 5 which is originally covering on the other face of said binder tape 2 is peeled off, the edge of said mat 1 is

emerged out of said edge 32 of the staircase 3 about 1~1.5cm for alleviating possible collision with the child; and
 a ground mat 7 laid on the base ground of said staircase 3 for reducing the injury to the child falling down from upstairs. 5

2. The safety stair mat of claim 1, wherein said small protuberances 16 on said top surface 11 and said shock resistive studs 13 on said bottom surface 12 are omitted according to the property of material used for said mat 1.. 10
3. The safety stair mat of claim 1, wherein said safety mat is made integrally in one piece of EVA foaming substance. Or combined with two materials, wherein the top layer is formed of EVA forming substance, while the bottom layer is formed of shock resistive and easily severable rubber foaming substance, plastic foaming substance, or resin foaming substance. 15
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4. The safety stair mat of claim 1, wherein said scored lines 15, said tenons 18 and said mortises 17 are all in a frangible state so as to facilitate cutting of the dummy portion of said mat emerged out of said stairstep 31 along said scored line 15 thereby matching the size of the stairstep 31 of said staircase 3. 25
30
5. The safety stair mat of claim 1, wherein an extension mat 6 is additionally connected to said mat 1 in case the size of said mat 1 is not enough to cover said stairstep 31, the extension procedure is performed by coupling tenons 61 (or mortises 62) of said extension mat 6 with said mortises 17(or said tenons 18) of said mat 1. 35
6. The safety stair mat of claim 1, wherein said ground mat 7 is provided with frangible scored lines 73, tenons 72 and mortises 71 along its edges serving as connection means, if said ground mat 7 laid under said stair steps 31 be insufficient in length and width, said tenons 72 and mortises 71 can be coupled to expand its to a desired size unlimitedly. 40
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7. The safety stair mat of claim 1, wherein said two-face binder tape 2 can use any kind of binding agents according to different requirements. 50

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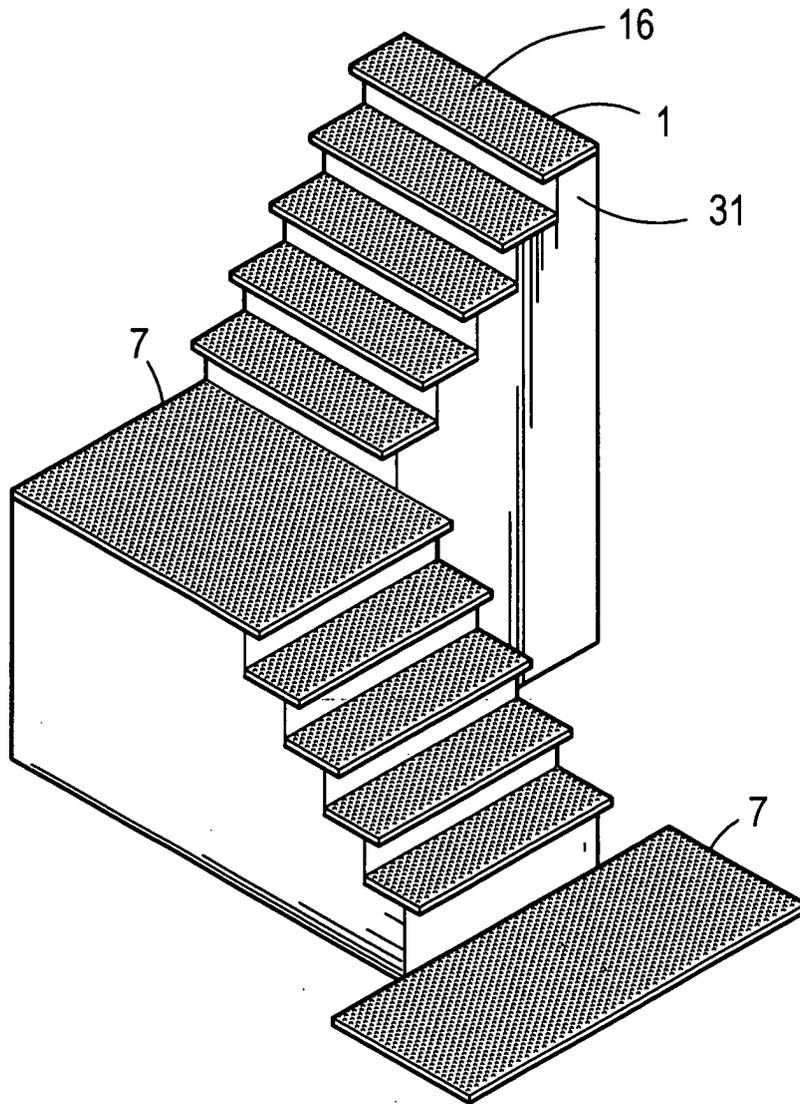


FIG. 1

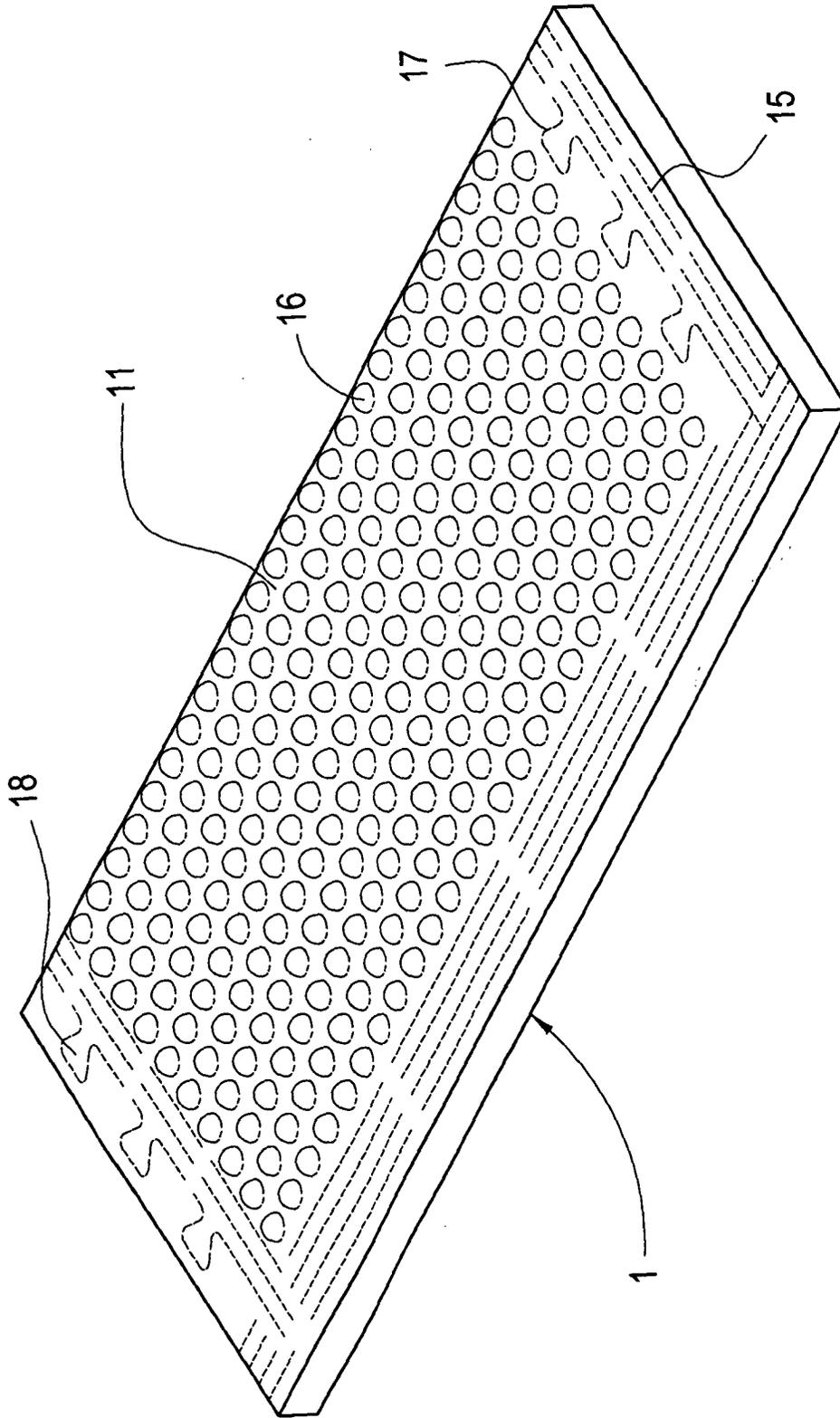


FIG. 2 A

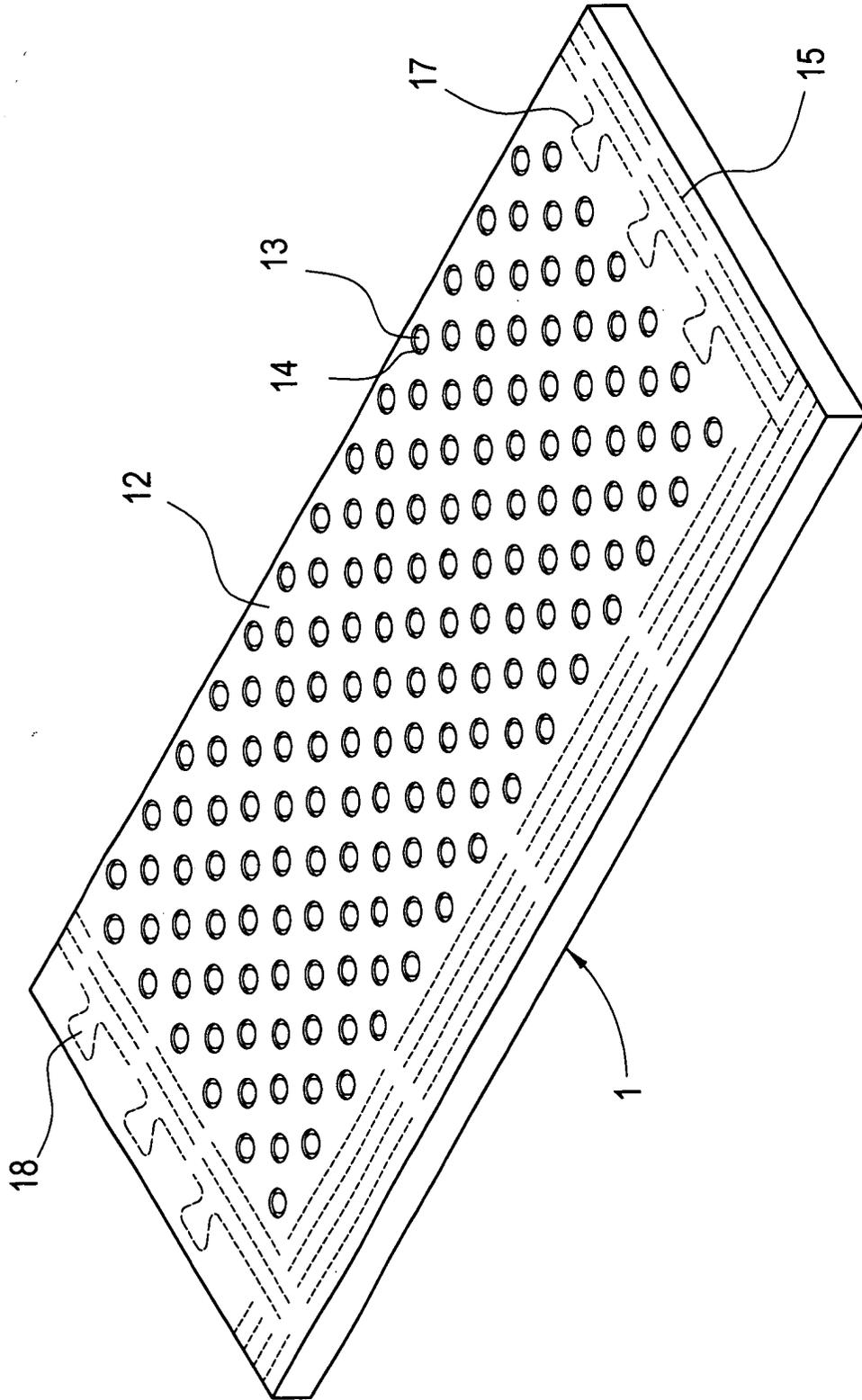


FIG. 2 B

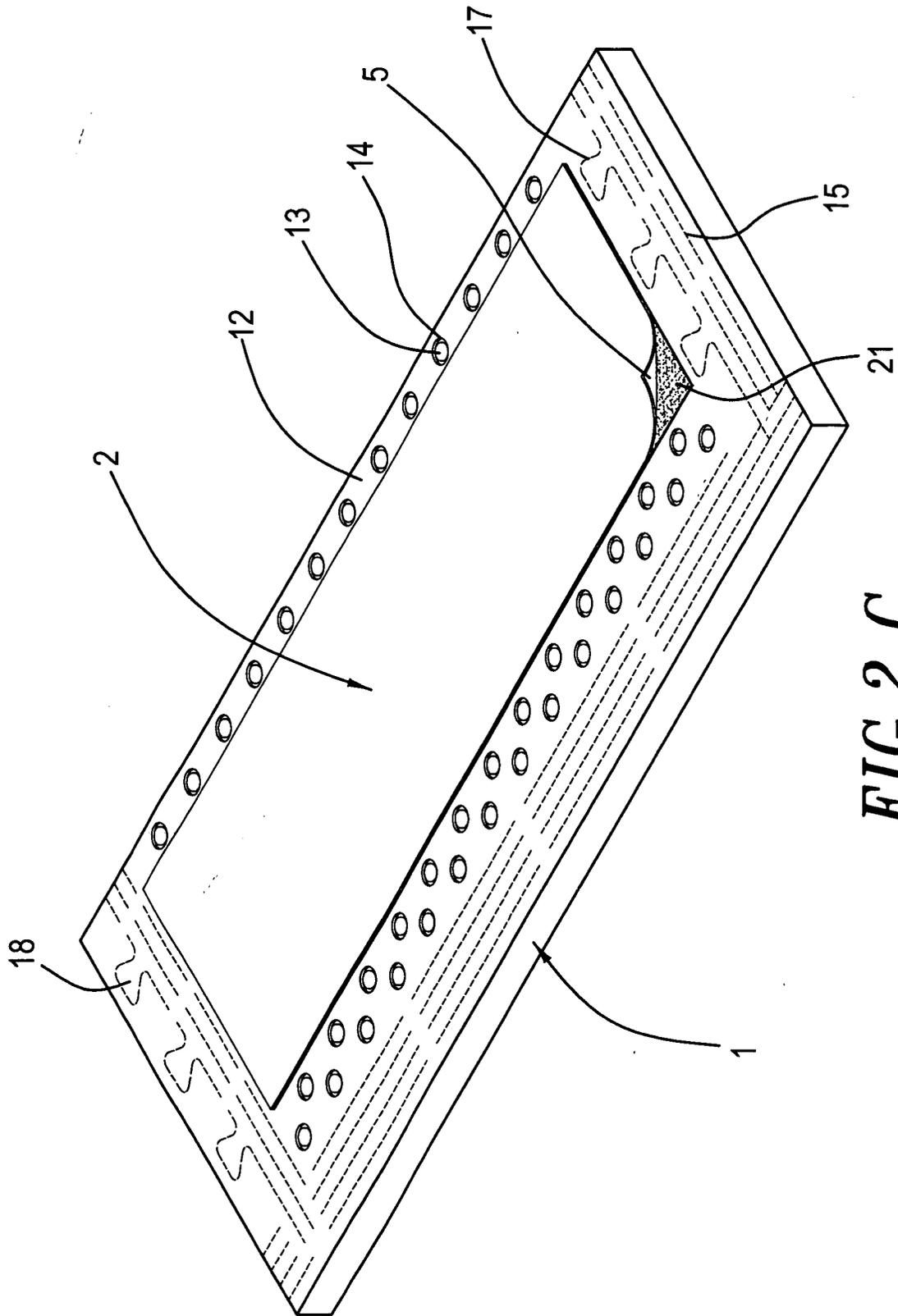


FIG. 2 C

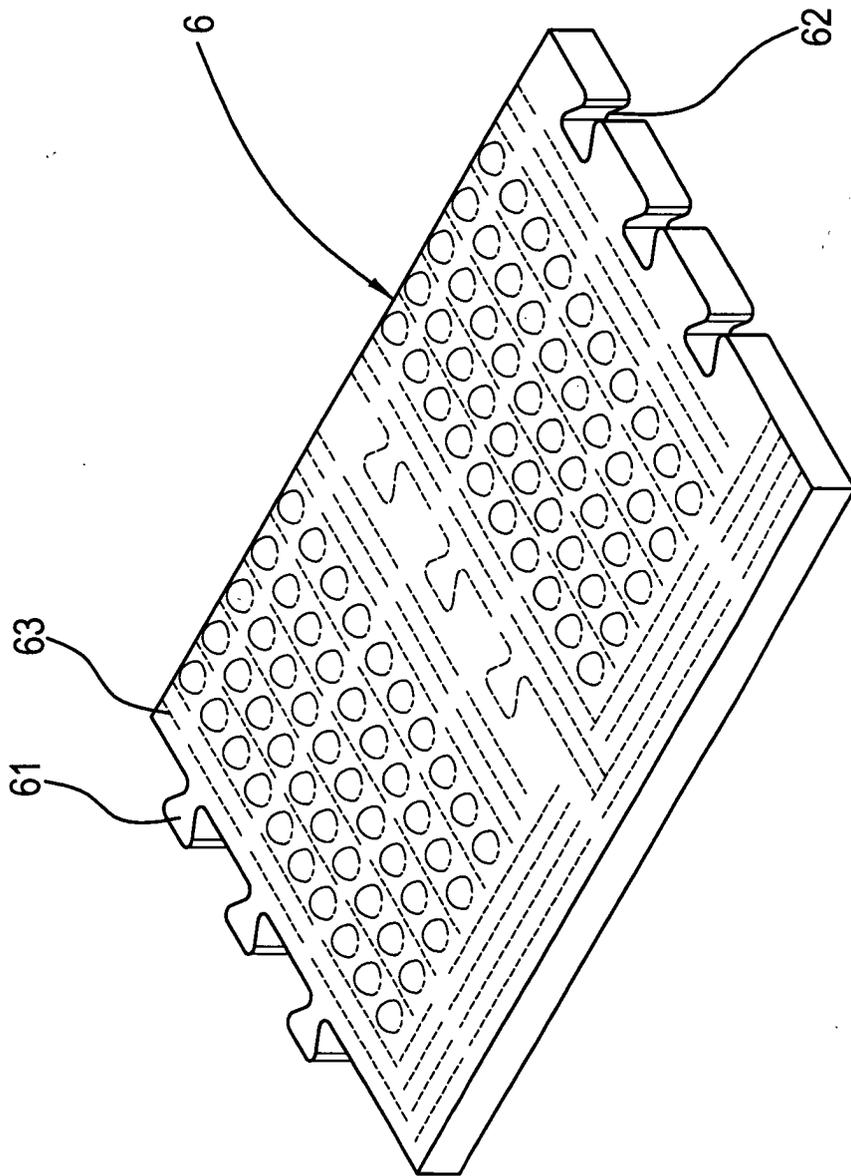


FIG. 3 A

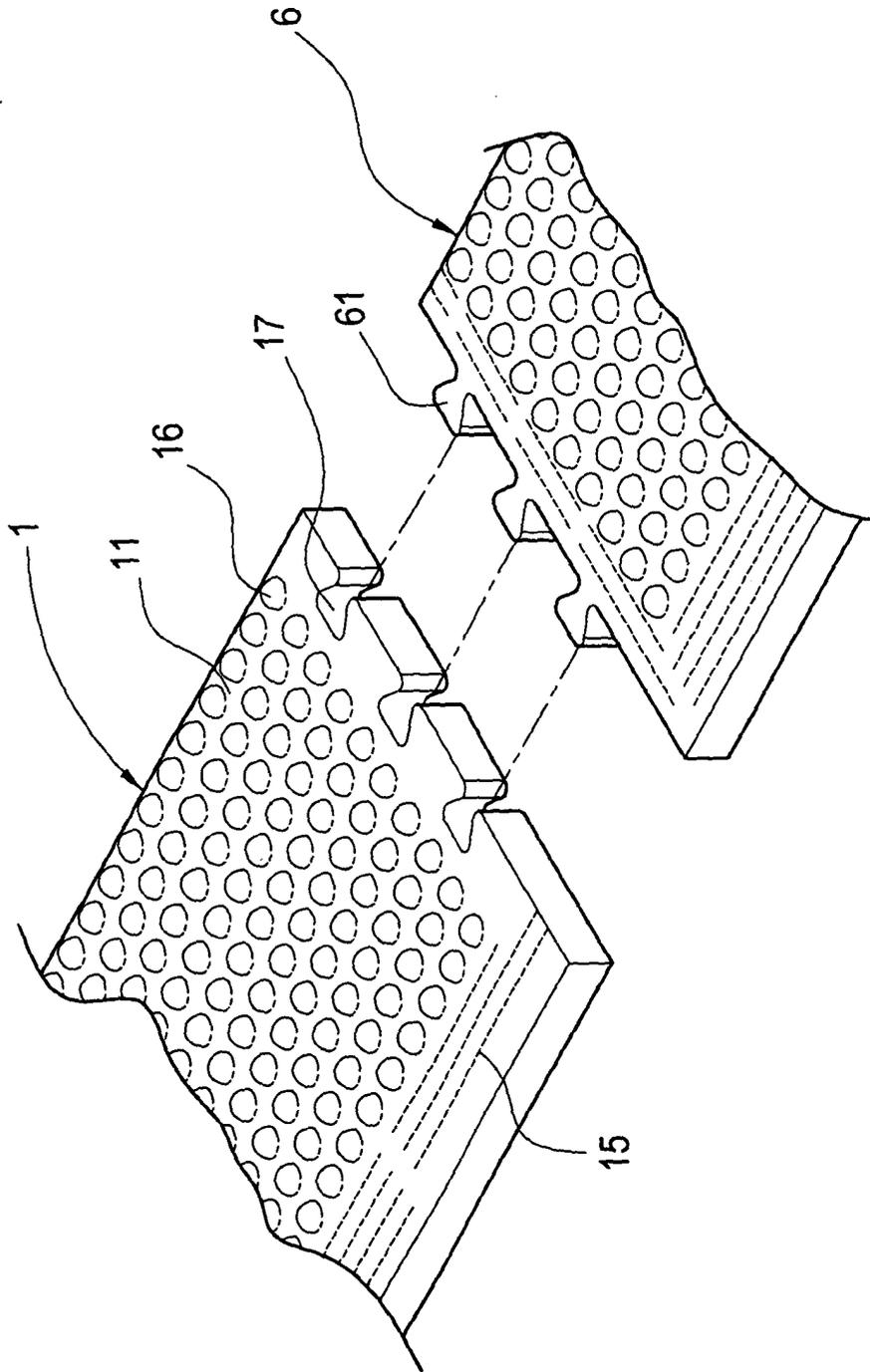


FIG.3 B

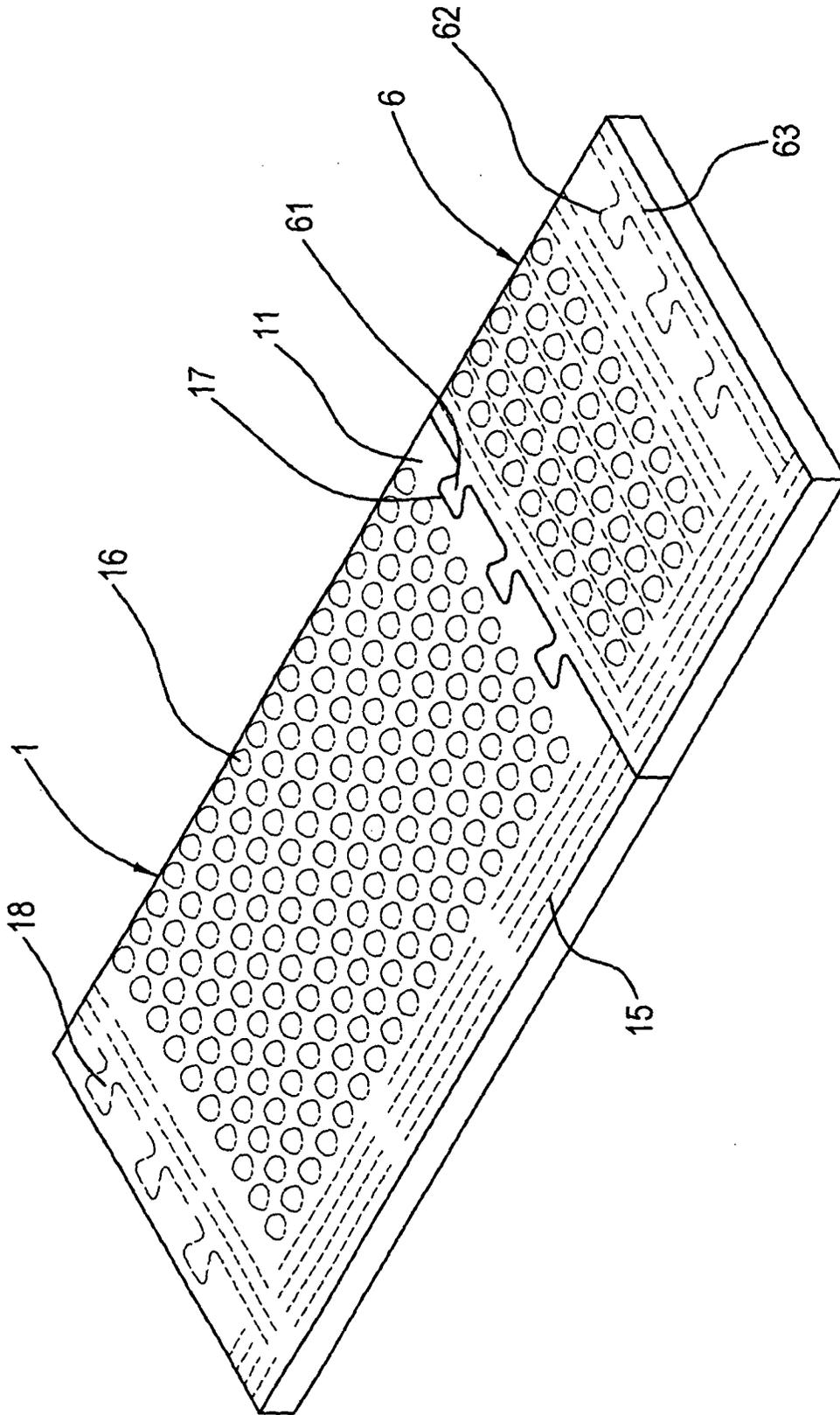


FIG. 3 C

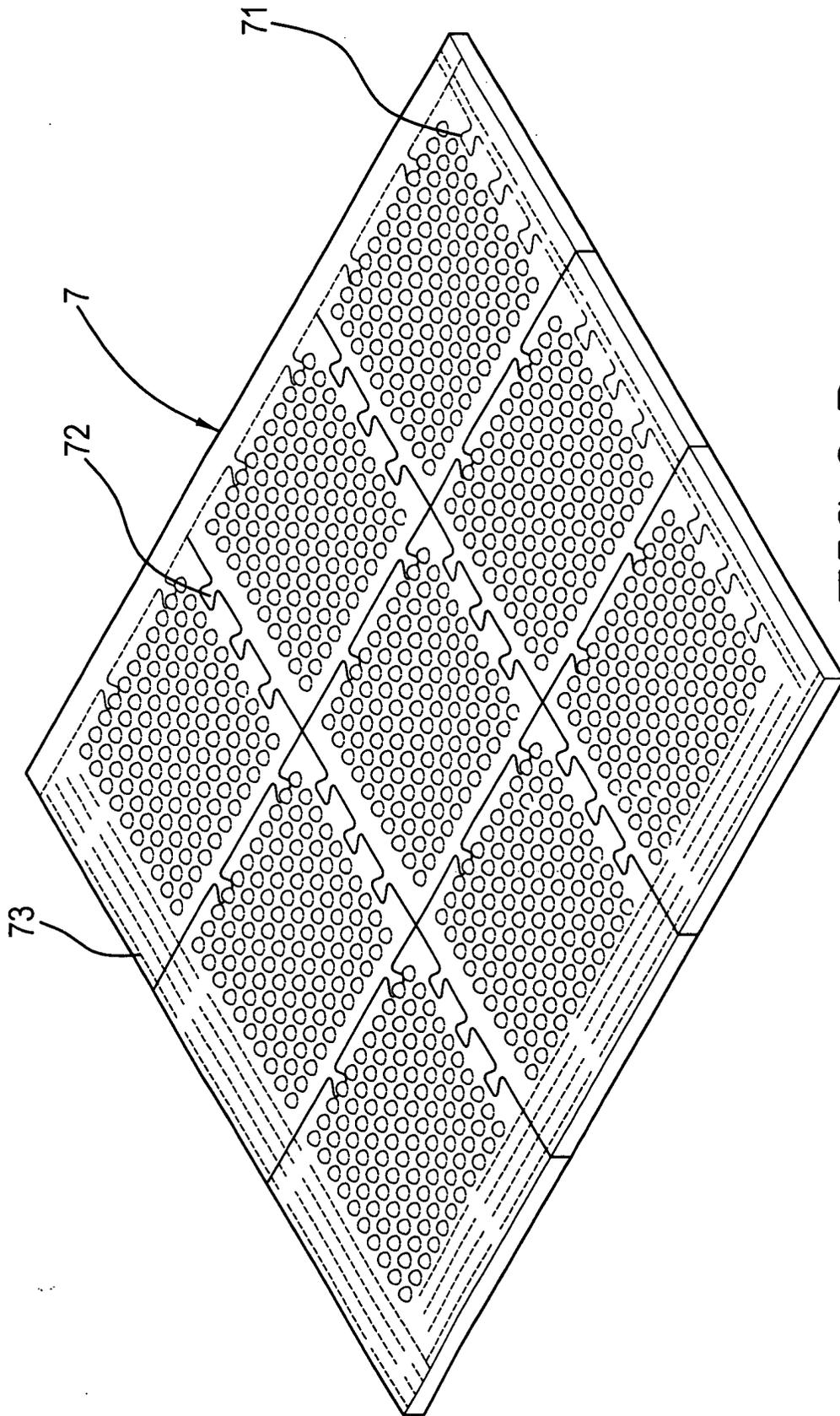


FIG. 3 D

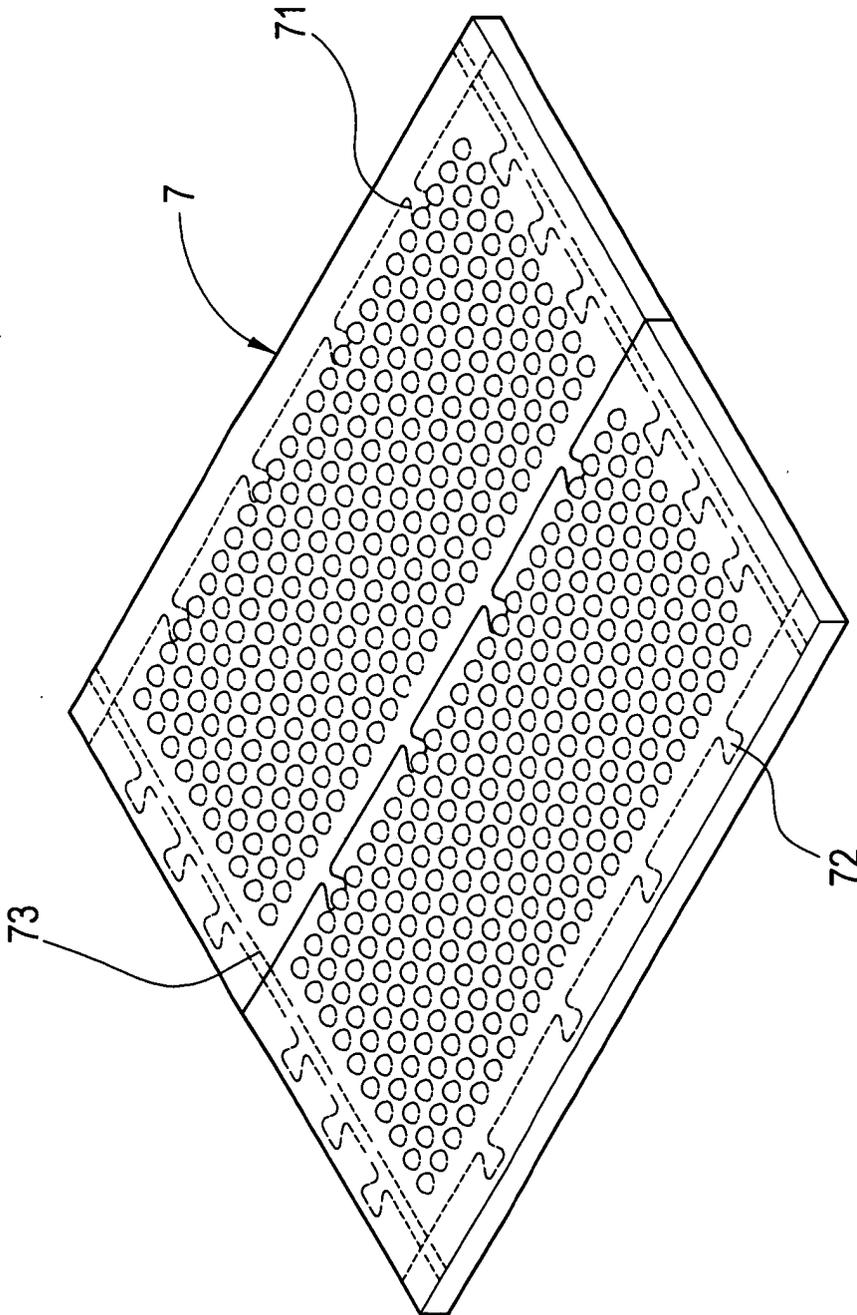


FIG. 3 E

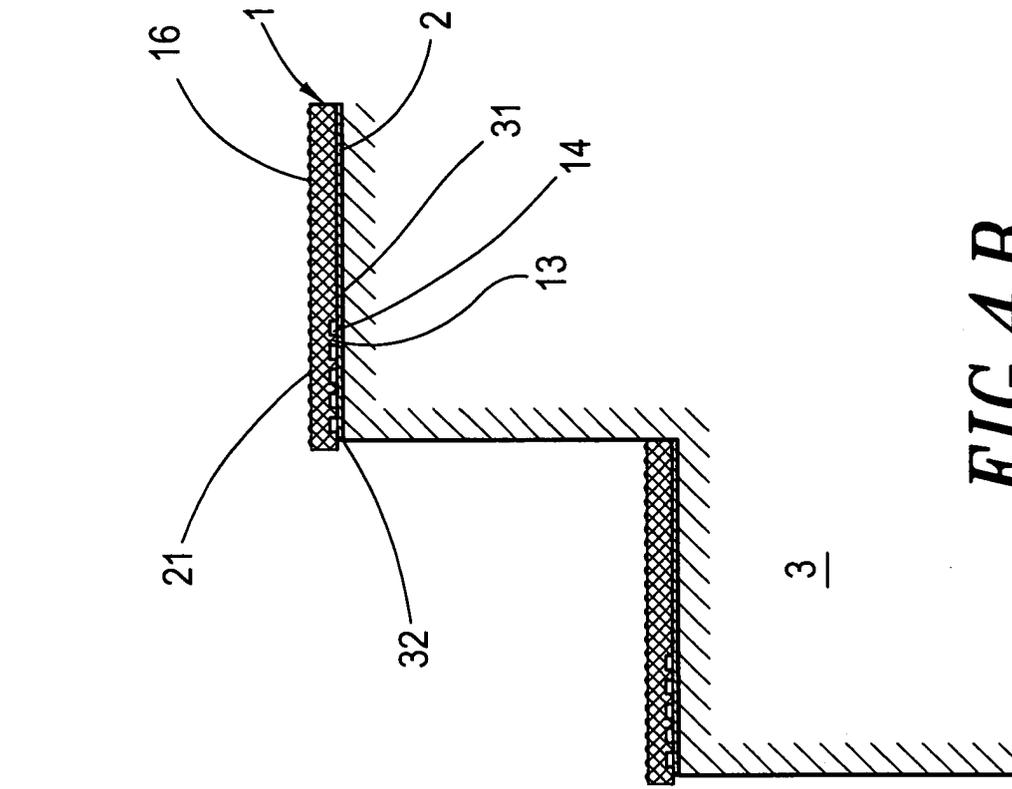


FIG. 4 B

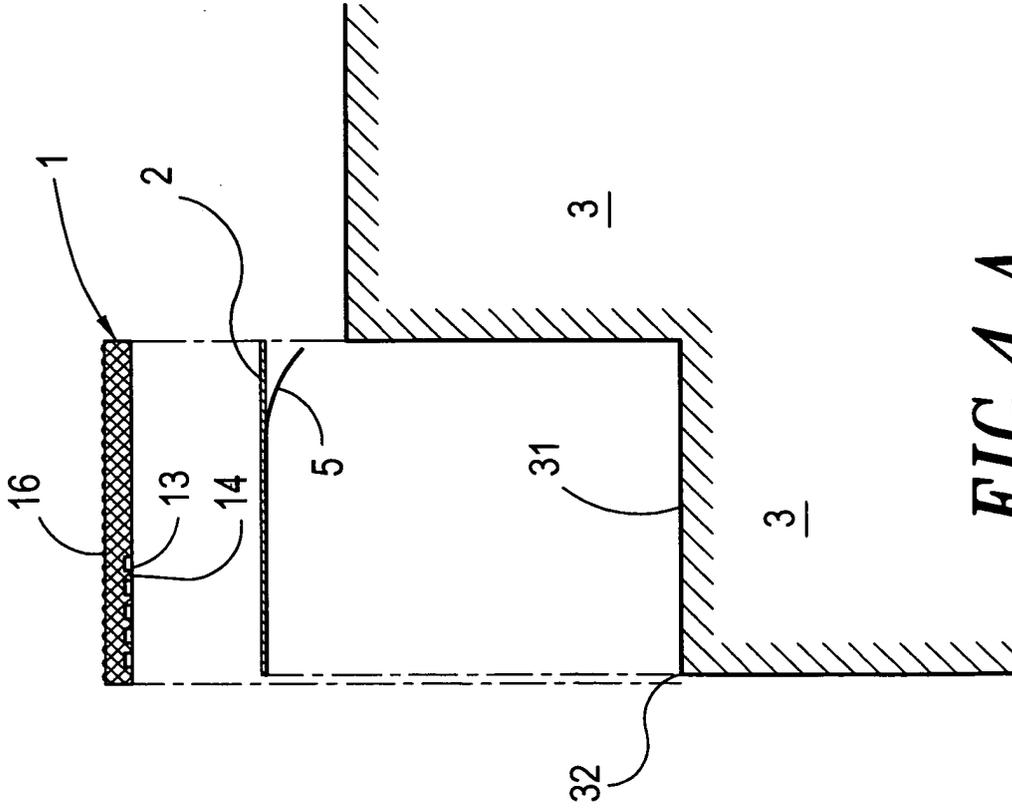


FIG. 4 A

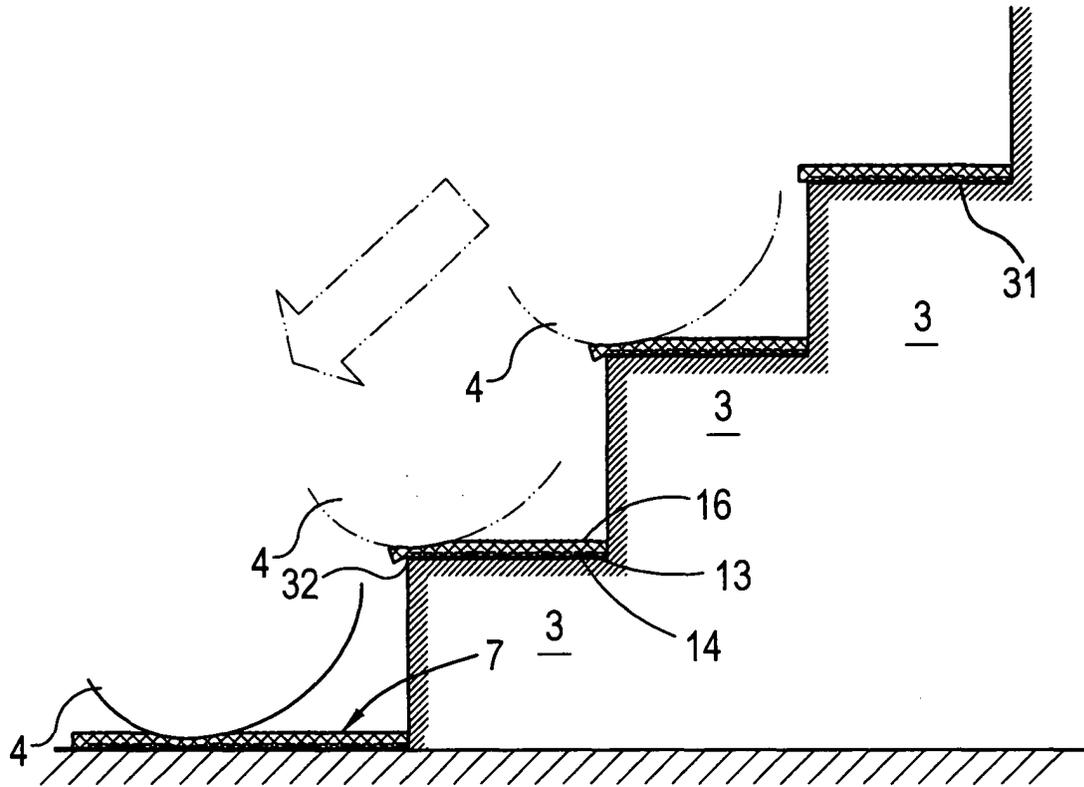


FIG. 5 A

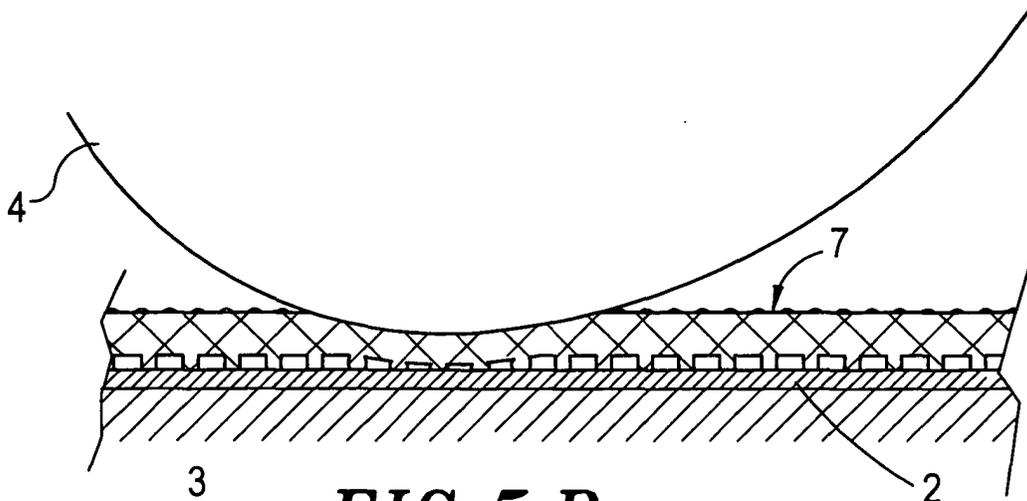


FIG. 5 B



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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 8113

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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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E04F A47G B68G
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
MUNICH		10 July 2003	Kerouach, M
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EP 03 00 8113

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10-07-2003

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