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(54) **Sports mat**

(57) The present invention provides a sports mat comprising a cover with two opposite, parallel, horizontal, rectangular main surfaces and four vertical side surfaces connecting said main surfaces, one main surface being substantially open and being provided along the circumferential edge thereof with at least one flap which joins the side surfaces. The sports mat further comprises at

least one foam plastic layer in the cover as well as an outer layer at the location of the open main surface. The at least one flap is provided with Velcro material of the first type on the side facing the interior of the cover and the outer layer is provided on the inner side of said at least one flap, being made of or being circumferentially provided with Velcro material of the second type, which interlocks with Velcro material of the first type.

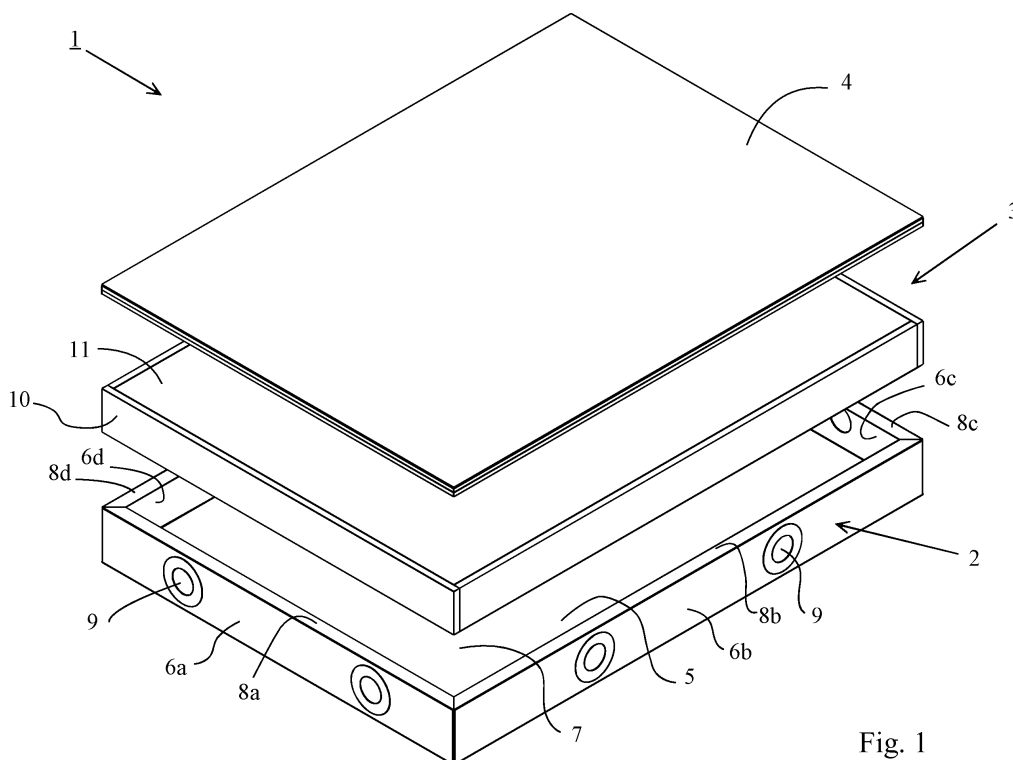


Fig. 1

## Description

**[0001]** The present invention relates to a sports mat comprising a cover with two opposite, parallel, horizontal, rectangular main surfaces and four vertical side surfaces connecting said main surfaces, one main surface being substantially open and being provided along the circumferential edge thereof with at least one flap which joins the side surfaces, which sports mat further comprises at least one foam plastic layer in the cover as well as an outer layer at the location of the open main surface. More specifically, the invention relates to mats as used in physical education and/or in gymnastics. Such mats are gym mats, landing mats and/or fall mats, for example, which differ from each other as regards their damping characteristics and thicknesses, which depend on the use for which the sports mat in question is intended.

**[0002]** A sports mat as described in the introduction is known from CH 671 341 Ar. Said publication describes a gym mat which comprises a cover having an open upper side. Said cover includes, from the bottom up, a layer of polyether foam and a layer of high-density polyethylene foam, which layers may be glued together. At the open upper side, the cover furthermore extends along the circumferential edge of the upper side, so that the cover is provided as a circumferential strip on the upper side, and the open upper side is not entirely but partially open. The size of said opening provides enough space for introducing the aforesaid foam layers into the cover via the open upper side. Provided on top of the mat is a carpet layer of the needle-punched felt type, whose dimensions correspond to those of the upper side. Said carpet layer thus overlies the aforesaid circumferential strip at the upper side of the cover. To connect the carpet layer to the cover, a vertically downwardly extending connecting strip is connected to the circumference of the carpet layer along the circumferential edge of the carpet layer. The downwardly extending part of said connecting strip is connected to the upper side of the vertical side surfaces of the cover by glueing or by stitching the downwardly extending part in question to the cover.

**[0003]** An important drawback of said known sports mat is that the production, more specifically the assembly, of such mats is relatively time-consuming and thus costly, in particular on account of the required "closing" of the open upper side, which involves connecting the connecting strip, which extends downwards from the carpet layer, to the side surfaces of the cover. In addition to that, connecting the connecting strip to the circumference of the carpet layer takes relatively much time.

**[0004]** As an aside, it is noted that U.S. patent application US 2008/152860 describes a cover for a sports mat which is intended to be washed after temporary use. The cover is intended to absorb transpiration. In use, the cover is only arranged over the upper side of the sports mat. To prevent the cover from becoming displaced over the mat, the cover is provided with elastic strips at the four corners, which strips can be folded over the sports

mat. Alternatively, the use of Velcro, among other things, is generally suggested.

**[0005]** It is a primary object of the present invention to solve or at least significantly alleviate the above drawbacks. In order to accomplish that object, the sports mat according to the present invention is **characterised in that** said at least one flap is provided with Velcro material of the first type on the side facing the interior of the cover and that the outer layer is provided on the inner side of said at least one flap, being made of or being circumferentially provided with Velcro material of the second type, which interlocks with Velcro material of the first type. The invention makes it much easier to assemble a sports mat as described in the introduction in that, after said at least one foam plastic layer has been placed into the cover via the opening in the upper surface thereof, the outer layer can subsequently be arranged over said at least one foam plastic layer in the cover via the same opening, whereupon the connection between the outer layer and the cover can be realised by pressing the flaps down on the outer layer, so that an interlocking engagement is realised between the Velcro material of the first type on the inner side of said at least one flap and the Velcro material of the second type associated with the outer layer. The time-consuming task of sewing together parts of the sports mat, more specifically of the outer layer to the cover, for assembling a sports mat is not necessary (insofar as it is at all possible in practice).

**[0006]** Quite preferably, the outer layer is of the carpet type, more specifically of the needle-punched felt type. Such material can as such function as one side of a Velcro connection, so that it is no longer necessary to provide separate Velcro material (of the second type) along the circumferential edge of the outer layer when such material is used. In addition to that, an outer layer of the carpet type, for example of the needle-punched type, is also very comfortable for sports people who make use of such a sports mat.

**[0007]** To prevent the outer layer from becoming wrinkled in the course of time as a result of the use of the sports mat according to the invention, it is quite preferable, in particular if the outer layer is a layer according to a preferred embodiment of the carpet type as described in the foregoing, if the outer layer forms an outer layer of an assembly of interconnected layers, which assembly comprises at least one layer of a shock-absorbing foam material. By using such an assembly (having a sandwich structure) of interconnected layers, the outer layer will form part of a more rigid whole, so that wrinkling is prevented. The foam material may be polyethylene, neoprene or polystyrene, for example. More in general it is preferable in that case if the hardness of the selected foam material is at least 30 Kpa at 50% compression. Furthermore preferably, said hardness is at most 500 Kpa. In practice a hardness ranging between 50 Kpa and 90 Kpa will generally result in a suitable characteristic. Precisely in the preferred embodiments the advantages of the invention become quite manifest, since such as-

semblies, because of the typical total thickness of the foam layer/foam layers ranging between 1 cm and 6 cm (i.e. exclusive of the thickness of the outer layer) are not suitable for being sewn.

**[0008]** According to another very advantageous preferred embodiment, the assembly comprises a strengthening layer between said at least one layer of a shock-absorbing foam material and the outer layer. Especially if the sports mat according to the invention is used as a landing mat, the use of a strengthening layer as described above will reduce the risk of the outer layer being damaged during a landing.

**[0009]** The use of a net as a strengthening layer has been found to be very effective, because there is additionally a direct connection, via the meshes in the net, between the strengthening layer and the layer of shock-absorbing material disposed under the net.

**[0010]** According to an alternative preferred embodiment, the outer layer consists of PVC and is provided with the Velcro material of the second type along the circumferential edge thereof. The use of PVC has the advantage that the outer layer has more advantageous hygienic and fire-resistant properties.

**[0011]** To obtain advantageous shock-absorbing properties when using a PVC outer layer, it is advantageous if an assembly of interconnected layers is provided between the outer layer and said at least one foam plastic layer, which assembly comprises at least one layer of a shock-absorbing foam material as well as a layer of the carpet type, preferably of the needle-punched type, that faces the outer layer. An important additional advantage is that the PVC outer layer can be easily removed, if desired, so that the carpet-type layer will be the outer layer. The sports mat can thus be used both as a sports mat having a PVC outer layer and as a sports mat having a carpet-type outer layer.

**[0012]** For reasons already set forth in the foregoing, it is preferable if the assembly comprises a strengthening layer, preferably comprising a net, between said at least one layer of shock-absorbing foam material and the carpet-type layer.

**[0013]** To facilitate the introduction of material into the cover as much as possible, it is preferable if the at least one flap comprises a separate flap for each of the side surfaces, which flaps can flap independently of each other. Thus, all flaps can in principle be oriented vertically, thus realising a maximum-sized opening in the open main surface.

**[0014]** According to another preferred embodiment, said at least one flap is provided with Velcro material, preferably of the second type, on sides thereof remote from the interior of the cover. Said Velcro material can be used for interconnecting adjacent sports mats by means of a wide strip of Velcro material.

**[0015]** It is furthermore very advantageous if the Velcro material of the first type is hook-type material and the Velcro material of the second type is loop-type material. Hook-type Velcro material has a significantly harder char-

acteristic than loop-type Velcro material. Since the loop-type Velcro material faces upwards, and the hook-type Velcro material faces downwards, any contact between the sports person who uses the sports mat and the Velcro material will take place in particular with loop-type Velcro material, which is much more comfortable for the sports person.

**[0016]** The present invention further relates to a method for manufacturing a sports mat according to the invention, comprising the steps of - providing a cover comprising two opposite, parallel, horizontal, rectangular main surfaces and four vertical side surfaces connecting said main surfaces, one main surface being substantially open and being provided along the circumferential edge thereof with at least one flap which joins the side surfaces and which is provided with Velcro material of the first type on the side facing the interior of the cover,

- providing at least one foam plastic layer,
- providing an outer layer made of or circumferentially provided with Velcro material of the second type,
- placing said at least one foam plastic layer and subsequently the outer layer into the cover via the open main surface,
- pressing the inner side of said at least one flap down on the outer layer from the outer side of the cover for effecting an interlocking engagement between the Velcro material of the first type and the Velcro material of the second type.

**[0017]** Preferably, the method according to the invention further comprises the steps of:

- providing an assembly of interconnected layers, which assembly comprises at least one layer of a shock-absorbing foam material as well as a carpet-type layer provided on an outer side of the assembly,
- placing the assembly into the cover between the steps of placing said at least one foam plastic layer into the cover and placing the outer layer into the cover, said carpet-type layer being disposed on the side of the assembly remote from said at least one foam plastic layer.

**[0018]** The advantages connected with the use of a method according to the invention as described above are analogous to the advantages connected to the sports mat according to the invention.

**[0019]** The invention will be explained in more detail below by means of a description of a number of preferred embodiments of the present invention with reference to the following figures:

Figure 1 is an exploded view of a landing mat according to the invention;

Figure 2 is an exploded view of an assembly as used in the landing mat of figure 1;

Figure 3 is an exploded view of another landing mat

according to the invention;

Figure 4 is an exploded view of a fall mat according to the invention;

Figure 5 is an exploded view of a gym mats according to the invention.

**[0020]** In figure 1 a landing mat 1 is shown. The landing mat 1 comprises a cover 2, a foam core 3 and a layer assembly 4.

**[0021]** The cover 2 comprises a flat horizontal rectangular bottom 5, four side surfaces 6a-6d extending upwardly from the circumferential edge of the bottom 5, and an at least substantially open upper surface 7, which extends parallel to the bottom 5 and which has the same dimension as the bottom 5. The cover 2 is provided with flaps 8a-8d for each side surface 6a-6d along the circumferential edge of the upper surface 7, which flaps extended in the plane of the upper surface 7 in a starting situation. The flaps 8a-8d jointly form a circumferential strip, as it were, as is shown in figure 1. Each flap 8a-8d can flap up or down from the starting situation. On sides facing the interior of the cover 2, the flaps 8a-8d are provided with Velcro material over the entire area of the flaps 8a-8d. Said Velcro material is of the hook type. Two handles 9 are provided in each of the side surfaces 6a-6d. The cover 2 is made of a canvas-like material.

**[0022]** The foam core 3 comprises an edge of a stabilising PP foam 10 along its circumference, within which relatively soft PE foam 11 is provided.

**[0023]** The layer assembly 4, which is shown in more detail in figure 2, has a sandwich structure. At the upper side, the assembly 4 comprises a carpet layer 12 of the needle-punched type, PE layers 13, which may differ from each other as regards their density and/or thickness, depending on the desired damping characteristic, and, between the carpet layer 12 and the PE layers, a strengthening layer 14, which is in fact configured as a net. The layers 12-14 of the layer assembly are glued together, for example by flame bonding. The number of PE layers 13 may also be limited to one.

**[0024]** Assembly of the landing mat 1 can take place in a very simple manner by collecting the cover 2, the foam core 3 and the layer assembly 4 at one location and subsequently placing the foam core 3 and the layer assembly 4 in succession into the cover 2 through the opening in the upper surface 7 of the cover 2, with the flaps 8a-8d being disposed over the layer assembly 4. By subsequently pressing said flaps 8a-8d down on the assembly 4, a Velcro connection is realised between the layer assembly 4, more specifically the carpet layer 12 thereof, and the cover 2, more specifically the flaps 8a-8d thereof.

**[0025]** Figure 3 shows another landing mat 21, which is largely similar to the landing mat 1. For that reason parts of the landing mat 21 that correspond to parts of the landing mat 1 are indicated by the same numerals. The only difference between the landing mats 1 and 21 is the fact that the landing mat 21 is provided with an outer layer 22 of PVC material on top of the layer assembly 4.

At the upper side, the PVC outer layer 22 is provided with loop-type Velcro material 23 along the circumferential edge thereof. The landing mat 21 can be easily converted into a landing mat 1, if desired, by removing the PVC outer layer 22.

**[0026]** Figure 4 shows a fall mat 31, which is quite similar to the landing mats 1 and 21. The fall mat 31 comprises a cover 2, like the landing mats 1 and 21, and a PVC outer layer 22 circumferentially provided with Velcro material 23, like the landing mat 21. Except for the outer layer 22 provided with Velcro material 23, the cover 2 is filled with a foam core 32 of relatively soft PE foam. Alternatively, the foam core 32 could also have a sandwich structure and/or use could be made of different foam materials. Those skilled in the art will appreciate that, depending on the requirements that are made, the thickness of the fall mat 31, and thus of the cover 2, may be different from that of the landing mats 1 and 21, depending on the requirements made of the fall mat 31. Assembly of the fall mat 31 takes place in a manner which is absolutely comparable with the manner in which the landing mats 1 and 21 are assembled.

**[0027]** Figure 5, to conclude, shows a gym mat which is generally significantly thinner than a landing mat or a fall mat. It has been found that the advantages of a simplified assembly process can apply not only in the case of landing mats and fall mats but also in the case of gym mats. The gym mat 41 comprises a cover 42 which is thinner than the cover 2 but which for the rest has a comparable structure. The cover 42 is filled with a foam core 43, on top of which a PVC layer 44 is provided (at least in figure 5), the circumferential edge of which PVC layer is provided with Velcro material 45. The PVC layer 44 further comprises two handles 46.

**[0028]** Assembly of the gym mat 41 takes place in the manner shown in figure 5, i.e. with the open side of the cover 42 facing upwards. After assembly, the gym mat 41 is turned over, so that the bottom of the cover 42 forms the eventual upper side of the gym mat 41 in use.

**[0029]** The present invention is not limited to the embodiments described in the foregoing, but its scope is defined by the appended claims.

## Claims

1. A sports mat comprising a cover with two opposite, parallel, horizontal, rectangular main surfaces and four vertical side surfaces connecting said main surfaces, one main surface being substantially open and being provided along the circumferential edge thereof with at least one flap which joins the side surfaces, which sports mat further comprises at least one foam plastic layer in the cover as well as an outer layer at the location of the open main surface, **characterised in that** said at least one flap is provided with Velcro material of the first type on the side facing the interior of the cover and that the outer layer is

provided on the inner side of said at least one flap, being made of or being circumferentially provided with Velcro material of the second type, which interlocks with Velcro material of the first type.

2. A sports mat according to claim 1, **characterised in that** the outer layer is of the carpet type. 5
3. A sports mat according to claim 2, **characterised in that** the outer layer is of the needle-punched felt type. 10
4. A sports mat according to claim 1, 2 or 3, **characterised in that** the outer layer forms an outer layer of an assembly of interconnected layers, which assembly comprises at least one layer of a shock-absorbing foam material. 15
5. A sports mat according to claim 4, **characterised in that** the assembly comprises a strengthening layer between said at least one layer of a shock-absorbing foam material and the outer layer. 20
6. A sports mat according to claim 5, **characterised in that** said strengthening layer comprises a net. 25
7. A sports mat according to claim 1, **characterised in that** the outer layer consists of PVC and is provided with the Velcro material of the second type along the circumferential edge thereof. 30
8. A sports mat according to claim 7, **characterised in that** an assembly of interconnected layers is provided between the outer layer and said at least one foam plastic layer, which assembly comprises at least one layer of a shock-absorbing foam material as well as a layer of the carpet type, preferably of the needle-punched type, that faces the outer layer. 35
9. A sports mat according to claim 8, **characterised in that** the assembly comprises a strengthening layer, preferably comprising a net, between said at least one layer of shock-absorbing foam material and the carpet-type layer. 40
10. A sports mat according to any one of the preceding claims, **characterised in that** the at least one flap comprises a separate flap for each of the side surfaces, which flaps can flap independently of each other. 45
11. A sports mat according to any one of the preceding claims, **characterised in that** said at least one flap is provided with Velcro material on sides thereof remote from the interior of the cover. 50
12. A sports mat according to claim 11, **characterised in that** said at least one flap is provided with Velcro 55

material, preferably of the second type, on sides thereof remote from the interior of the cover.

13. A sports mat according to any one of the preceding claims, **characterised in that** the Velcro material of the first type is hook-type material and the Velcro material of the second type is loop-type material.

14. A method for manufacturing a sports mat according to claim 1, comprising the steps of

- providing a cover comprising two opposite, parallel, horizontal, rectangular main surfaces and four vertical side surfaces connecting said main surfaces, one main surface being substantially open and being provided along the circumferential edge thereof with at least one flap which joins the side surfaces and which is provided with Velcro material of the first type on the side facing the interior of the cover,
- providing at least one foam plastic layer,
- providing an outer layer made of or circumferentially provided with Velcro material of the second type,
- placing said at least one foam plastic layer, and subsequently the outer layer, into the cover via the open main surface,
- pressing the inner side of said at least one flap down on the outer layer from the outer side of the cover for effecting an interlocking engagement between the Velcro material of the first type and the Velcro material of the second type.

15. A method according to claim 14, further comprising the steps of:

- providing an assembly of interconnected layers, which assembly comprises at least one layer of a shock-absorbing foam material as well as a carpet-type layer provided on an outer side of the assembly,
- placing the assembly into the cover between the steps of placing said at least one foam plastic layer into the cover and placing the outer layer into the cover, said carpet-type layer being disposed on the side of the assembly remote from said at least one foam plastic layer.

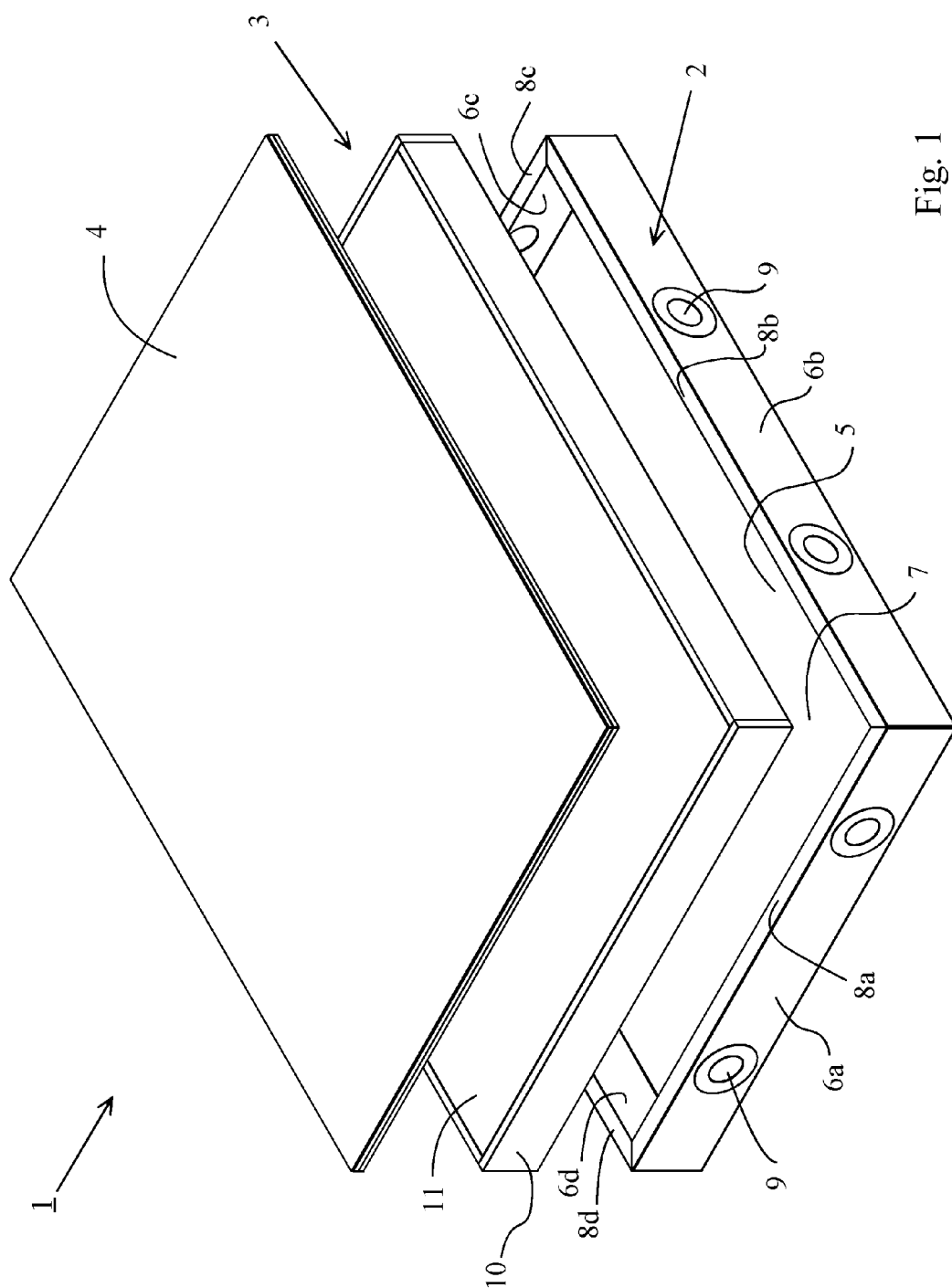


Fig. 1

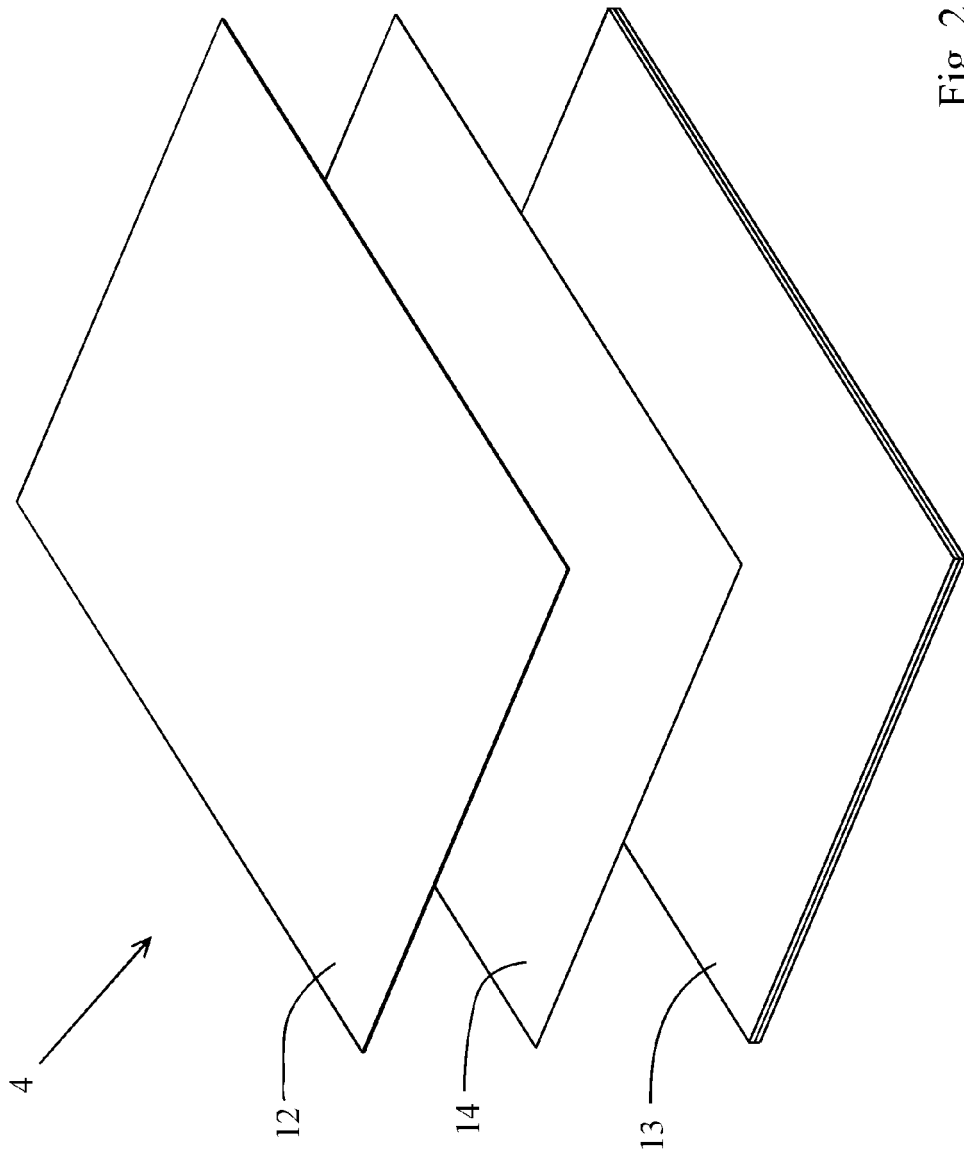


Fig. 2

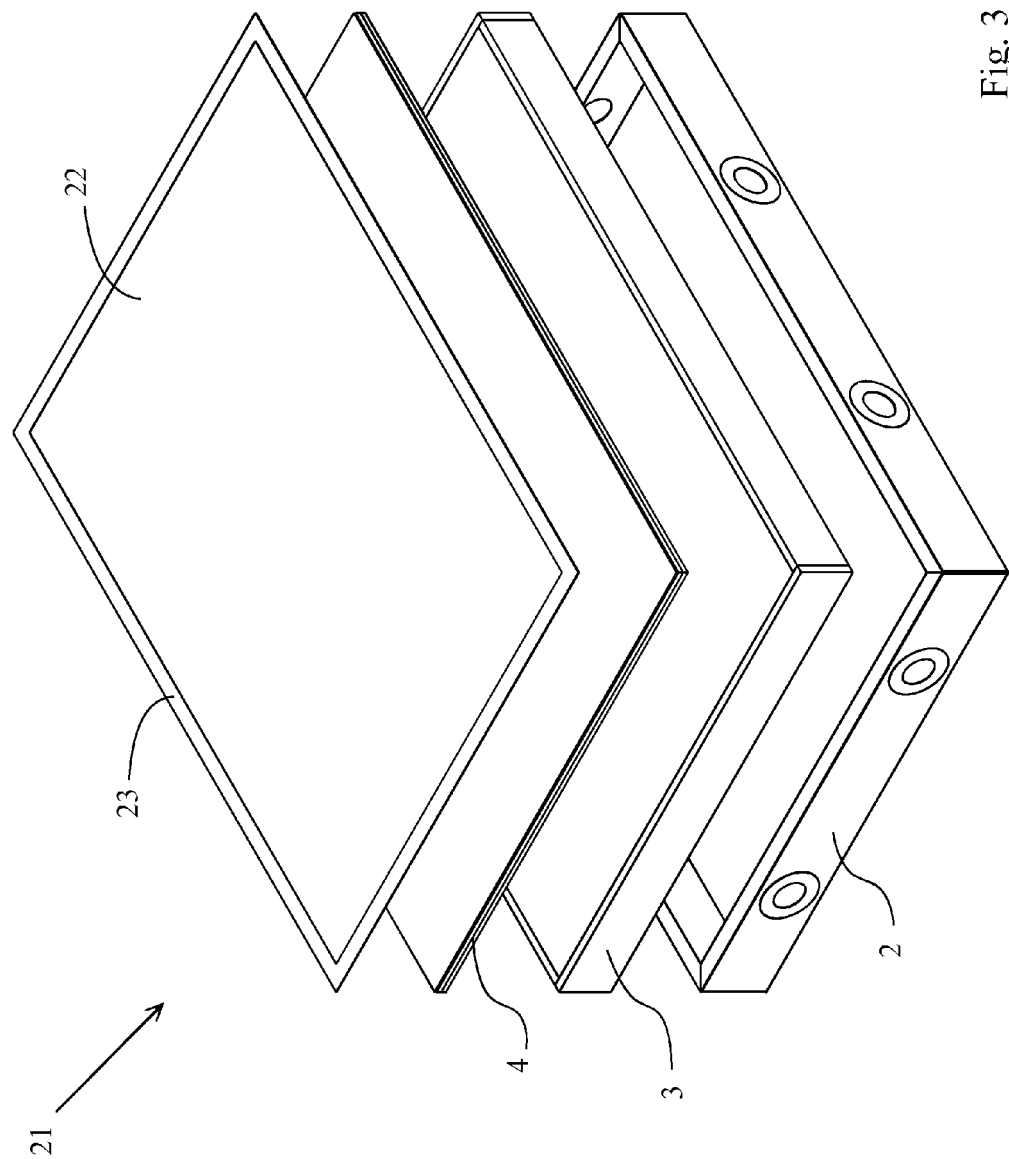


Fig. 3



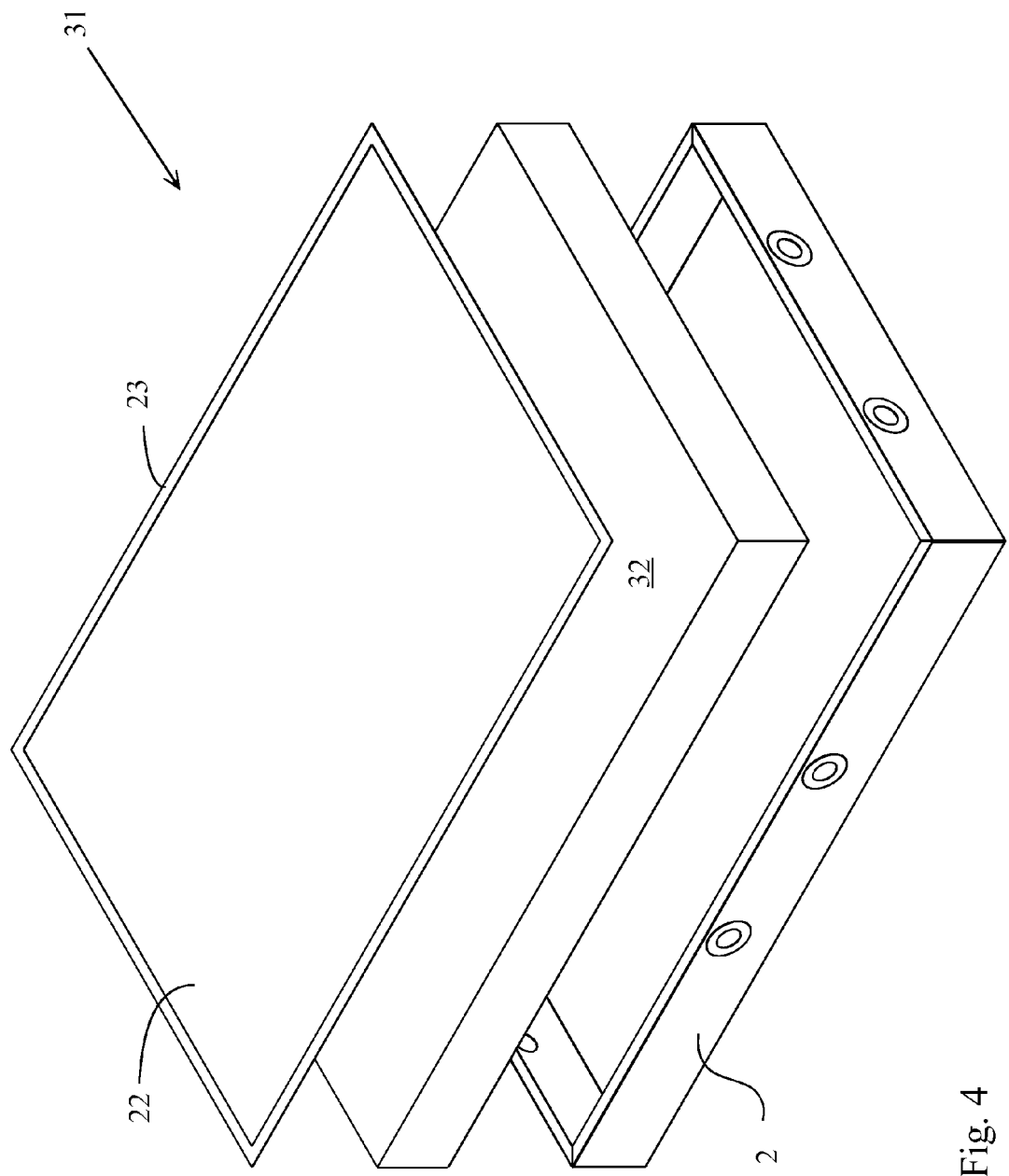


Fig. 4

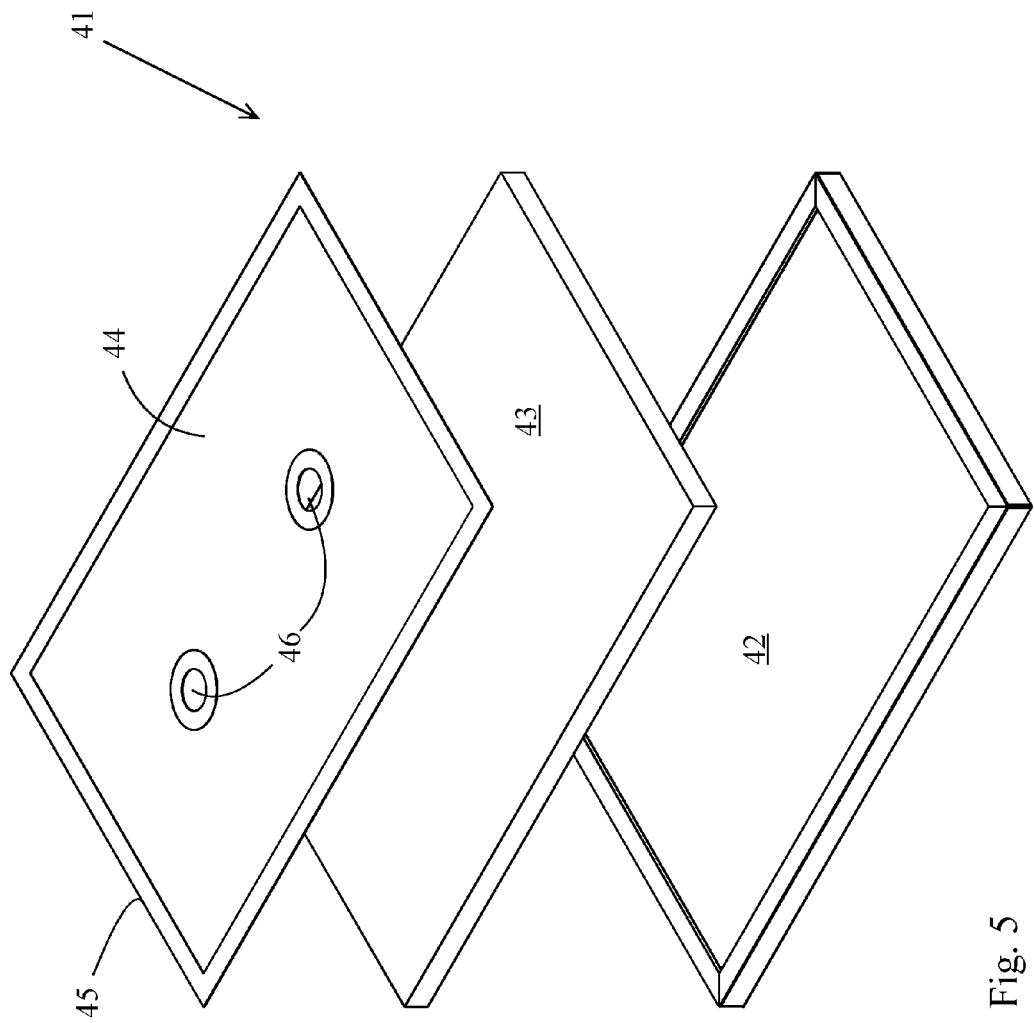


Fig. 5



## EUROPEAN SEARCH REPORT

Application Number  
EP 10 17 0568

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y,D	CH 671 341 A5 (VOLKER REINFRANK) 31 August 1989 (1989-08-31) * abstract; figures 1-5 *	1-15	INV. A63B6/00
Y	US 2008/152860 A1 (MEYER JACQUELINE LAVERNE [US]) 26 June 2008 (2008-06-26) * paragraph [0008] - paragraph [0009] * * paragraph [0020] - paragraph [0021]; figures *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 October 2010	Examiner Michels, Norbert
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			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 17 0568

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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18-10-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
CH 671341	A5	31-08-1989	AT 390194 B	26-03-1990
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US 2008152860	A1	26-06-2008	NONE	
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**REFERENCES CITED IN THE DESCRIPTION**

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- CH 671341 [0002]
- US 2008152860 A [0004]