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(54) **ELASTIC MODULE BALANCING CUSHION, ELASTIC CUSHION, AND FURNITURE**

(57) The present disclosure relates to the field of furniture and provides a balancing pad in use with elastic modules, an elastic pad and a furniture. The balancing pad comprises a pad body and a protective sheet, wherein: the pad body includes a first pad surface and a second pad surface opposite to the first pad surface in a thickness direction of the pad body, and the second pad surface is faced an elastic bases pad and is configured to have a plurality of receiving holes spaced apart and extending towards an interior of the pad body; the protective sheet

is laid over and connected with the first pad surface; each of the plurality of receiving holes is configured to receive a portion of a corresponding elastic module of the elastic base pad to restrict movement of the corresponding elastic module in a transverse direction of the pad body. Since the balancing pad restricts movement of the respective elastic modules when laid over the elastic base pad, the stability of the elastic modules when being subject to a pressure can be effectively improved, and the elastic pad can provide higher comfort.

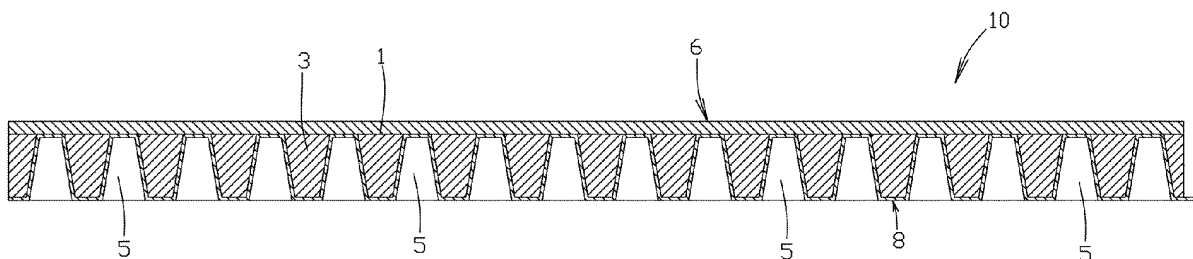


Fig. 5

Description

TECHNICAL FIELD

[0001] The present disclosure relates to the field of furniture, and particularly to a balancing pad in use with elastic modules, and an elastic pad and a furniture comprising the same.

BACKGROUND

[0002] Furniture such as beds is an indispensable object in people's life. Most of the conventional large-sized furniture is not easily disassembled or not easily restored after disassembly. However, with the development of modern life, it is required furniture especially such as beds are able to be disassembled and assembled more and more frequently to meet the needs of population migration and field leisure. During transportation, it is very difficult to disassemble and assemble the beds, resulting in that the beds which are still in use are sometimes discarded to reduce the transportation burden.

[0003] A bed normally consists of a bed frame, an elastic pad, and an outer cover. A conventional elastic pad is usually one-piece, non-detachable and integral pad formed from a plurality of superimposed layers and springs. The integral pad is large in size and is not easy to be disassembled and stored.

[0004] A conventional separately-pocketed spring mattress is intended to avoid two or more people lying in bed at the same time from affecting each other (e.g., if a weight difference between individuals is relatively large, one of them will inevitably affect the other when turning over or moving the body). In this type of mattresses, each spring is individually packaged in a pocket or sleeve made of a nonwoven fabric or other material. The spring pockets are arranged in a pattern and then the outside of the arranged set of spring pockets is covered by a whole piece of foam rubber by adhesion, gluing or the like to form a furniture pad or a desired elastic pad in the form of the furniture pad. However, the separately-pocketed spring mattress is still an integral product that cannot be disassembled and is not easily transported. In addition, in the separately-pocketed spring mattress, non-woven fabrics used for wrapping the pocketed springs are adhered to each other, and when the mattress is pressed, the plurality of pocketed springs cannot move up and down separately, thereby affecting the comfort of the mattress.

[0005] Additionally, the conventional mattresses also have a disadvantage that they are not easy to clean. For a typical mattress, only the outer cover is often removable, and the sponge portion cannot be removed and not easily cleaned. Even though some treated sponges might have a certain anti-mite effect, since the mattress might be usually used for years, the sponge portion that is not easily cleaned might cause a large hygienic hazard.

SUMMARY

[0006] To address at least some of the problems existing in the prior art products, one of the object of the present disclosure is to enable an elastic pad to have better comfort.

[0007] In order to achieve the above objective, in the first aspect, the present disclosure provides a balancing pad in use with elastic modules, the balancing pad comprising: a pad body comprising a first pad surface and a second pad surface opposite to the first pad surface in a thickness direction of the pad body, wherein the second pad surface is faced an elastic base pad and is configured to have a plurality of receiving holes spaced apart and extending towards an interior of the pad body; a protective sheet laid over and connected with the first pad surface, wherein each of the plurality of receiving holes is configured to receive a portion of a corresponding elastic module on the elastic base pad to restrict movement of the corresponding elastic module in a transverse direction of the pad body.

[0008] In the said technical solution, the pad body of the balancing pad is formed thereon with the plurality of receiving holes spaced apart and extending towards the interior of the pad body, the protective sheet is laid over and connected with the first pad surface, and each receiving hole is configured to receive a portion of a corresponding elastic module of the elastic base pad to restrict movement of the corresponding elastic module in the transverse direction. In this way, when assembled to form an elastic pad, the balancing pad can be laid over the elastic base pad including a plurality of elastic modules, while a portion of each elastic module can be received within a corresponding receiving hole. At this time, due to limitation action caused by the receiving hole of the pad body, the movement of the respective elastic module in the transverse direction (i.e., a direction parallel to the pad body) can be effectively restricted so as to prevent the respective elastic module from tilting due to a force applied thereon, thereby effectively maintaining the support stability of the respective elastic module. In addition, the protective sheet can not only provide a good protection for the first pad surface of the pad body, but can also connect the pad body as a whole to provide a restriction for the corresponding elastic module in the transverse direction, thereby preventing the pad body from being pulled and displaced in the transverse direction as an effect of the elastic modules. This can further restrict the movement of the elastic modules in the transverse direction by means of the pad body. Further, the protective sheet can also restrict the positions of the elastic module to prevent the movement of the elastic module in the axial direction of the receiving hole. Therefore, the balancing pad, when laid over the elastic base pad, restricts the movement of the respective elastic modules in the transverse direction, and thus can effectively improve the stability of the elastic pad when being subject to a pressure, which makes the elastic pad more comfortable.

[0009] In some embodiments, the receiving hole penetrates through the pad body in thickness, and the protective sheet covers the plurality of the receiving holes.

[0010] In some embodiments, a dimension of a cross section of the receiving hole is set to gradually increase in a direction from the first pad surface to the second pad surface.

[0011] In some embodiments, the pad body is an elastic body, and the protective sheet is a flexible sheet.

[0012] In some embodiments, the elastic body is a sponge body, and the flexible sheet is a non-woven fabric sheet.

[0013] In some embodiments, the balancing pad comprises a protective lining which is laid over and connected with the second pad surface and comprises recessed portions recessed into the respective receiving holes, each of the recessed portions includes a top wall and a sidewall around the top wall, the sidewall and an inner peripheral surface of the receiving hole are fit and connected with each other, the top wall faces towards the first pad surface, and the pad body is wrapped between the protective sheet and the protective lining.

[0014] In some embodiments, the top wall and the protective sheet are connected with each other.

[0015] In some embodiments, the protective lining is formed of a material as same as that of the protective sheet; and/or the recessed portion is consistent with the receiving hole in shape.

[0016] In order to achieve the above objective, in a second aspect, the present disclosure provides a balancing pad in use with elastic modules, comprising: a pad body comprising a first pad surface and a second pad surface opposite to the first pad surface in a thickness direction of the pad body, the second pad surface is faced an elastic base pad and is configured to have a plurality of receiving holes spaced apart and extending towards an interior of the pad body; a protective lining laid over and connected with the second pad surface and comprising recessed portions recessed into the respective receiving holes, each of the recessed portions comprising a top wall and a sidewall around the top wall, the sidewall and an inner surface of the receiving hole being fit and connected with each other, the top wall facing the first pad surface, wherein each of the receiving holes is configured to receive a portion of a corresponding elastic module of the elastic base pad to restrict movement of the corresponding elastic module in a transverse direction of the pad body.

[0017] In the technical solution, the pad body of the balancing pad is formed thereon with a plurality of receiving holes spaced apart and extending towards the interior of the pad body, and the protective lining is laid over and connected with the second pad surface and recessed into respective receiving holes. Moreover, the sidewall of each recessed portion of the protective lining that is recessed into the receiving hole and the inner surface of the receiving hole are fit and connected with each other. By doing so, each receiving hole can be used to receive

a portion of a corresponding elastic module of the elastic base pad in order to restrict the movement of the elastic module in the transverse direction. In this way, when assembled to form the elastic pad, the balancing pad can be laid over the elastic base pad including a plurality of elastic modules, and a portion of each elastic module can be received in a respective receiving hole in contact with the recessed portion of the protective lining that is recessed into the receiving hole. At this time, the recessed portion of the protective lining that is recessed into the receiving hole can prevent a portion of the elastic module from contacting with the inner peripheral surface of the receiving hole, so that a good protection for the inner peripheral surface of the receiving hole is provided. Besides, due to restriction effect produced by the receiving hole of the pad body, the movement of the respective elastic module in the transverse direction (i.e., the direction parallel to the pad body) can be effectively restricted, thereby preventing the respective elastic module from tilting due to a force applied thereon. Thus, it can effectively maintain the support stability of the respective elastic module. The protective lining can not only provide a good protection for the second pad surface of the pad body, but also can integrally connect the second pad surface and the inner peripheral surfaces of the receiving holes in the transverse direction in order to limit the position of the pad body in the transverse direction (i.e., preventing the pad body from being pulled or displaced in the transverse direction under an action produced by the elastic module). This can further restrict the movement of the elastic module in the transverse direction with the aid of the pad body. Furthermore, when the portion of the elastic module located within the receiving hole is in contact with the top wall, the top wall can limit the position of the elastic module, thereby preventing movement of the elastic module in the axial direction of the receiving hole. As the movement of each elastic module in the transverse direction can be restricted when the balancing pad is laid over the elastic base pad, the stability of the elastic pad when being subject to a force can be efficiently improved, which makes the elastic pad more comfortable.

[0018] In some embodiments, the receiving hole penetrates through the pad body in thickness, the top wall is disposed at an opening of the receiving hole which is located at the first pad surface, and an outer surface of the top wall is flush with the first pad surface.

[0019] In some embodiments, a dimension of a cross section of the receiving hole is set to gradually increase in a direction from the first pad surface to the second pad surface; and/or the recessed portion is consistent with the receiving hole in shape.

[0020] In some embodiments, the pad body is an elastic body, and the protective lining is a flexible sheet.

[0021] In some embodiments, the elastic body is a sponge body, and the flexible sheet is a non-woven fabric sheet.

[0022] In a third aspect, the present invention provides

an elastic pad, comprising: an elastic base pad comprising a plurality of elastic modules; and the balancing pad according to any one of the first and second aspects, wherein the balancing pad is laid over the elastic base pad, and a portion of each of the elastic modules is received and located within a corresponding one of the receiving holes, wherein the receiving hole can restrict movement of the plurality of elastic modules in a transverse direction of the pad body.

[0023] As describe above in the first and second aspects, since the balancing pad restricts movement of the respective elastic modules when being laid over the elastic base pad, the stability of the elastic modules can be effectively improved when a pressure is applied thereto, and the elastic pad can provide higher comfort for a user.

[0024] In some embodiments, elastic module is in a truncated conical shape and is fit within the receiving hole in a form of a truncated conical hole.

[0025] In some embodiments the elastic pad further comprises an outer cover covering the balancing pad and wrapping the balancing pad and at least a portion of the elastic base pad.

[0026] In a fourth aspect, the present disclosure provides a furniture, comprising the elastic pad according to the third aspect.

[0027] The furniture includes, is not limited to, a mattress, a sofa, a chair, a sofa bed, an upholstered bench and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Dimensions and proportions in the drawings do not represent the dimensions and proportions of actual products. The drawings are only provided illustratively, and some unnecessary elements or features are omitted therefrom for clarity.

Fig. 1 is a perspective view schematically showing a pad body of a balancing pad according to a preferred embodiment of the present disclosure;

Fig. 2 is an exploded view schematically showing a balancing pad according to a preferred embodiment of the present disclosure;

Fig. 3 is a schematic view schematically showing a structure where a balancing pad in Fig. 2 is assembled;

Fig. 4 is an exploded view schematically showing a balancing pad according to a further preferred embodiment of the present disclosure;

Fig. 5 is a schematic view schematically showing a structure where a balancing pad in Fig. 4 is assembled;

Fig. 6 is a schematic view schematically showing an

enlarged local structure of the balancing pad in Fig. 5;

Fig. 7 is an exploded view schematically showing a balancing pad according to a still further preferred embodiment of the present disclosure;

Fig. 8 is a schematic view schematically showing a structure where the balancing pad in Fig. 7 is assembled;

Fig. 9 is a schematic view schematically showing an enlarged local structure of the balancing pad in Fig. 8;

Fig. 10 is a schematic view schematically showing a structure of an elastic pad according to a preferred embodiment of the present disclosure, where a portion of an outer cover is omitted for clearly displaying an elastic base pad and a balancing pad; and

Fig. 11 is a schematic view schematically showing a structure of an elastic module of the elastic base pad of the elastic pad in Fig. 10.

Reference signs

[0029] 1 - first pad surface, 2 - second pad surface, 3 - pad body, 4 - elastic base pad, 5 - receiving hole, 6 - protective sheet, 7 - elastic module, 8 - protective lining, 9 - top wall, 10 -balancing pad, 11 - sidewall, 12 - elastic pad, 13 - outer cover, 14 - spring support, 15 - conical spring.

DETAILED DESCRIPTION OF EMBODIMENTS

[0030] Reference now will be made to the drawings to describe the present disclosure in detail. What will be described herein will only cover preferred embodiments of the present disclosure, and those skilled in the art would envision, on the basis of the preferred embodiments, other possible manners which also fall into the scope described herein.

[0031] Figs. 2 and 3 schematically show a balancing pad 10 in use with elastic modules according to a first preferred embodiment of the present disclosure. Referring to Figs. 1, 2 and 3, the balancing pad 10 according to the first preferred embodiment of the present disclosure includes a pad body 3 and a protective sheet 6, where the pad body 3 includes a first pad surface 1 and a second pad surface 2 opposite to the first pad surface 1 in a thickness direction of the pad body, the second pad surface 2 is faced an elastic base pad 4 and is configured to have a plurality of receiving holes 5 spaced apart and extending towards the interior of the pad body, the protective sheet 6 is laid over and connected with the first pad surface 1, and each of the plurality of receiving holes 5 is configured to receiving a portion of a corresponding elastic module 7 on the elastic base pad 4 to restrict the movement of the corresponding elastic mod-

ule 7 in the transverse direction of the pad body 3.

[0032] As described above, the second pad surface 2 of the pad body 3 of the balancing pad 10 is formed thereon with the plurality of receiving holes 5 spaced apart and extending towards the interior of the pad body, the protective sheet 6 is laid over and connected with the first pad surface 1, and each of the plurality of receiving holes 5 is configured to receiving a portion of a corresponding elastic module 7 of the elastic base pad 4 to restrict the movement of corresponding elastic module 7 in the transverse direction of the pad body 3. In this way, when assembled to form the elastic pad 12, the balancing pad 10 can be laid over the elastic base pad 4 including a plurality of elastic modules 7, while a portion of each elastic module 7 can be received within a respective receiving hole 5. At this time, due to limitation action caused by the receiving hole 5 of the pad body 3, the movement of the respective elastic module 7 in the transverse direction (i.e., a direction parallel to the pad body) can be effectively restricted so as to prevent the respective elastic module 7 from tilting due to a force applied thereon, thereby effectively maintaining the support stability of the respective elastic module 7. In addition, the protective sheet 6 cannot only provide a good protection for the first pad surface 1 of the pad body 3, but can also connect the pad body 3 as a whole to provide a restriction for the corresponding elastic module in the transverse direction, thereby preventing the pad body 3 from being pulled and displaced in the transverse direction as an effect of the elastic module 7. This can further restrict the movement of the elastic module 7 in the transverse direction by means of the pad body 3. Further, the protective sheet 6 can also restrict the position of the elastic module 7 to prevent the movement of the elastic module 7 in the axial direction of the receiving hole 5. Therefore, the balancing pad 10, when laid over the elastic base pad 4, restricts the movement of the respective elastic module 7 in the transverse direction, and thus can effectively improve the stability of the elastic pad 12 when being subject to a pressure, which makes the elastic pad 12 more comfortable.

[0033] The balancing pad 10 can be used to form an elastic pad.

[0034] In the balancing pad 10, the protective sheet 6 may be bonded, ultrasonically welded, fastened via magic fasteners, or connected in other manners, to the first pad surface 1. The protective sheet 6 may be a single sheet, or may be laminated multiple sheets.

[0035] In the balancing pad 10, the receiving hole 5 may be a countersunk hole, i.e., the receiving hole 5 extends towards the interior of the pad body 3 but does not penetrate through the first pad surface 1. At this time, the protective sheet 6 can be connected to the top wall of the countersunk hole to reinforce the strength of the top wall, and further prevent the movement of the elastic module 7 in the axial direction of the receiving hole 5. Alternatively, in some embodiment, the receiving hole 5 may penetrate through the pad body 3 in thickness, i.e.,

the receiving hole 5 extends from the second pad surface 2 to the first pad surface 1, and the protective sheet 6 covers a plurality of receiving holes 5. In the case, the receiving hole 5 can receive a portion of the elastic module 7 as many as possible. When the portion, of the elastic module 7, received within the receiving hole 5 is in contact with the protective sheet 6, the protective sheet 6 can limit the elastic module 7 to prevent the elastic module 7 from moving in the axial direction of the receiving hole 5.

[0036] In the balancing pad 10, a dimension of a cross section of the receiving hole 5 may be identical in the axial direction thereof, i.e., the receiving hole 5 may be a hole consistent in diameter, so that the portion of the elastic module 7 can abut against the protective sheet 6 after entering the receiving hole 5. Alternatively, the dimension of the cross section of the receiving hole 5 may be varied in the axial direction thereof to form a stop flange within the receiving hole 5, so that the portion of the elastic module 7 can abut against the stop flange after entering the receiving hole. Alternatively, referring to Fig. 6, the dimension of cross section of the receiving hole 5 is set to gradually increase in the direction from the first pad surface 1 to the second pad surface 2, to form a frustum hole. In the case, since the dimension of the cross section of the frustum hole is tapered in the direction towards the first pad surface 1, the protective sheet 6 seals the small port of the frustum hole. In practice, the portion of the elastic module 7 can abut against the tapered inner peripheral surface of the receiving hole 5 after entering the receiving hole 5. Optionally, as matching the frustum hole, the elastic module 7 may be formed as a frustum, where the cone slope of the frustum may be identical to that of the receiving hole 5. In this way, a portion of the frustum may fit in the frustum hole in shape, to form cone-fit therebetween. Therefore, the portion of the elastic module 7 can mate with the receiving hole 5 in a more stable and more reliable manner, so that the balancing pad 10 can provide more stable and more reliable restriction for the elastic module 7. In addition, the receiving hole 5 may be a square hole, or may be a round hole. For example, the receiving hole may be a square or round frustum hole.

[0037] In the balancing pad 10, the pad body 3 may not be elastic, for example, which may be a thin plastic panel, and the protective sheet 6 may be a plastic cloth having a predetermined thickness that may be bonded to and laid over a surface of the thin plastic panel. Alternatively, the pad body 3 is an elastic body, and the protective sheet 6 is a flexible sheet. In the case, the flexible sheet can be laid over or connected to the first pad surface 1 of the elastic body via an adhesive or by ultrasonic welding. After the elastic body is laid over the elastic base pad 4 to form an elastic pad 12, when the elastic pad is subject to a pressure, the elastic module 7 is correspondingly compressed to provide a support. Since the pad body 3 is an elastic body and the protective sheet 6 is flexible, the elastic body 3 is correspondingly elastically deformed to provide a buffer, and the protective sheet 6

is also deformed accordingly, to further restrict the movement of the respective elastic module in the transverse direction while effectively improving the stability of the elastic pad 12 when being subject to a pressure. In this way, the elastic pad 12 can provide higher comfort.

[0038] The elastic body may be of multiple types. For example, the elastic body may be a silicone body. Alternatively, the elastic body may be a sponge body, for example, a sponge body with a high elasticity, which can be easily formed in a desired shape, has a low cost, and is advantageous in breathability. In addition, the flexible sheet may be of multiple types. For example, the flexible sheet may be a plastic cloth with a predetermined thickness. Alternatively, the flexible sheet may be a fabric, for example, canvas or non-woven fabric sheet. The non-woven fabric sheet can introduce good moisture-proof and breathable properties to the balancing pad, and can also make the balancing pad more flexible and thinner. This can further make the elastic pad more comfortable.

[0039] Figs. 4 and 5 schematically show a balancing pad 10 according to a second preferred embodiment of the present disclosure. Referring to Figs. 1, 4 and 5, on the basis of the balancing pad 10 according to the first preferred embodiment of the present disclosure, the balancing pad may further include a protective lining 8. The protective lining 8 is laid over and connected to the second pad surface 2, and includes recessed portions recessed into the respective receiving holes 5. Each recessed portion, of the protective lining 8, recessed into the receiving hole includes a top wall 9 and a sidewall 11 around the top wall 9. The sidewall 11 and an inner peripheral surface of the receiving wall 5 are fit and connected with each other. The top wall 9 faces towards the first pad surface 1. The pad body 3 is wrapped between the protective sheet 6 and the protective lining 8.

[0040] As aforementioned, the protective lining 8 is laid over and connected to the second pad surface 2 and recessed into the respective receiving holes 5, and the sidewall 11 of each recessed portion, of the protective lining 8, recessed into the receiving hole 5 and the inner surface of the receiving hole 5 are fit and connected with each other. Therefore, each receiving hole 5 can be used to receive a portion of a corresponding elastic module of the elastic base pad to limit the movement of the elastic module in the transverse direction. In the case, when assembled to form the elastic pad 12, the balancing pad 10 can be laid over the elastic base pad 4 including a plurality of elastic modules 7, while a portion of each elastic module 7 can be received in a respective receiving hole 5 and in contact with the recessed portion, of the protective lining 8, recessed into the receiving hole 5. At this time, the recessed portion, of the protective lining 8, recessed into the receiving hole 5 can prevent the portion of the elastic module 7 from contacting with the inner peripheral surface of the receiving hole 5, to provide good protection for the inner peripheral surface of the receiving hole 5. Besides, due to the limitation action caused by the receiving hole 5 of the pad body 3, the movement of

the respective elastic module in the transverse direction (i.e., the direction parallel to the pad body) can be prevented so as to prevent the respective elastic module 7 from tilting due to a force applied thereon, thereby effectively maintaining the support stability of the respective elastic module. The protective lining 8 cannot only provide good protection for the second pad surface 2 of the pad body 3, but also can connect the second pad surface 2 and the inner peripheral surfaces of the receiving holes 5 as a whole in the transverse direction to limit the pad body in the transverse direction. In addition, as described above, the protective sheet 6 connects the pad body 3 as a whole in the transverse direction to limit the pad body 3 in the transverse direction. Accordingly, by means of the protective sheet 6 and the protective lining 8, the pad body 3 can be prevented from being pulled or displaced in the transverse direction as an effect of the elastic module 7, which can further restrict the movement of the elastic module 7 in the transverse direction with the aid of the pad body 3. Furthermore, when the portion, of the elastic module 7, located within the receiving hole 5 is in contact with the top wall 9, the top wall 9 can limit the elastic module 7, which can prevent that movement of the elastic module 7 in the axial direction of the receiving hole 5. As the movement of each elastic module in the transverse direction can be restricted when the balancing pad including the elastic modules 7 are laid over the elastic base pad, the stability of the elastic pad when being subject to a force can be efficiently improved, so that the elastic pad can provide a high comfort.

[0041] In the receiving hole 5, the top wall 9 can be kept a preset gap from the protective sheet 6. The size of the preset gap may be selected as actually required, for example, 1-2mm or other value. Alternatively, in some other embodiments, the top wall 9 is connected with the protective sheet 6. For example, the top wall 9 is connected with the protective sheet 6 via an adhesive or by ultrasonic welding. In this way, the top wall 9 and the protective sheet 6 connected with each other can increase the thickness, on one hand, to provide a better and longer axial support to the portion of the elastic module, and can also connect the first pad surface 1 with the second pad surface 2 of the pad body 3, on the other hand, to further prevent the pad body 3 from being pulled or displaced in the transverse direction as an effect of the elastic module 7, which can further restrict the movement of the elastic module 7 in the transverse direction by means of the pad body 3.

[0042] If the receiving hole 5 is a through hole, the top wall 9 and the protective sheet 6 can be directly connected with each other, or a sandwich body could be arranged between the top wall 9 and the protective sheet 6. The top wall 9 and the protective sheet 6 connected with each other can increase the thickness to provide a better and longer axial support to the portion of the elastic module. Alternatively, if the receiving hole 5 is a countersunk hole, the top wall 9, the top wall of the receiving hole 5 and the protective sheet 6 can be connected together. In the

case, the thickness can be further increased, to provide a better and longer axial support to the portion of the elastic module 7.

[0043] In the balancing pad, the material of the protective lining 8 may be different from that of the protective sheet 6. Alternatively, in some other embodiments, the protective lining 8 is formed of a material identical to that of the protective sheet 6, i.e., the material of the protective lining 8 may be identical to that of the protective sheet 6. For example, both of the protective lining 8 and the protective sheet 6 are formed of a non-woven fabric.

[0044] Like the protective sheet 6, the protective lining 8 may be of a single layer, or may be of multiple laminated layers.

[0045] The shape of the recessed portion is consistent with that of the receiving hole 5 such that the sidewall of the recessed portion can fully fit with the inner peripheral surface of the receiving hole 5.

[0046] Figs. 8 and 9 schematically show the balancing pad 10 according to the third preferred embodiment of the present disclosure. Referring to Figs. 1, 8 and 9, the balancing pad 10 in use with elastic modules includes a pad body 3 and a protective sheet 8. Wherein, the pad body 3 includes a first pad surface 1 and a second pad surface 2 opposite to the first pad surface 1 in a thickness direction of the pad body. The second pad surface 2 is faced an elastic base pad 4 and is configured to have a plurality of receiving holes 5 spaced apart and extending towards the interior of the pad body. The protective lining 8 is laid over and connected with the second pad surface 2, and includes recessed portions recessed into the respective receiving holes 5. Each recessed portion, of the protective lining 8, recessed into the receiving hole includes a top wall 9 and a sidewall 11 around the top wall 9. The sidewall 11 and the inner peripheral surface of the receiving wall 5 are fit and connected with each other. The top wall 9 faces the first pad surface 1. Each of the receiving holes is configured to receive a portion of a corresponding elastic module on the elastic base pad to restrict movement of the corresponding elastic module in a transverse direction of the pad body.

[0047] As described above, the second pad surface 2 of the pad body 3 of the balancing pad 10 is formed thereon with a plurality of receiving holes 5 spaced apart and extending towards the interior of the pad body, and the protective lining 8 is laid over and connected with the second pad surface 2 and recessed into the respective holes 5. Moreover, the sidewall 11 of each recessed portion of the protective lining 8 that is recessed into the receiving hole 5 and the inner surface of the receiving hole 5 are fit and connected with each other. By doing so, each receiving hole 5 can be used to receive a portion of a corresponding elastic module of the elastic base pad in order to restrict the movement of the elastic module in the transverse direction. In this way, when assembled to form the elastic pad 12, the balancing pad 10 can be laid over the elastic base pad 4 including a plurality of elastic modules 7, and a portion of each elastic module 7 can

be received in a corresponding receiving hole 5 in contact with the recessed portion of the protective lining 8 that is recessed into the receiving hole 5. At this time, the recessed portion of the protective lining 8 that is recessed into the receiving hole 5 can prevent the portion of the elastic module 7 from contacting with the inner peripheral surface of the receiving hole 5, so that a good protection for the inner peripheral surface of the receiving hole 5 is provided. Besides, due to restriction effect produced by the receiving hole 5 of the pad body 3, the movement of the respective elastic module in the transverse direction (i.e., the direction parallel to the pad body) can be effectively restricted, thereby preventing the respective elastic module 7 from tilting due to a force applied thereon. Thus, it can effectively maintain the support stability of the respective elastic module 7. The protective lining 8 cannot only provide good a protection for the second pad surface 2 of the pad body 3, but also can integrally connect the second pad surface 2 and the inner peripheral surfaces of the receiving holes 5 as a whole in the transverse direction in order to limit the position of the pad body in the transverse direction (i.e., preventing the pad body 3 from being pulled or displaced in the transverse direction under an action produced by the elastic module 7). This can further restrict the movement of the elastic module 7 in the transverse direction with the aid of the pad body 3. Furthermore, when the portion of the elastic module 7 located within the receiving hole 5 is in contact with the top wall 9, the top wall 9 can limit the position of the elastic module 7, thereby preventing movement of the elastic module 7 in the axial direction of the receiving hole 5. As the movement of each elastic module 7 in the transverse direction can be restricted when the balancing pad including the elastic modules 7 is laid over the elastic base pad, the stability of the elastic pad when being subject to a force can be efficiently improved, so that the elastic pad can provide high comfort.

[0048] The balancing pad 10 can be used to form an elastic pad.

[0049] In the balancing pad 10, the receiving hole 5 may be a countersunk hole, i.e., the receiving hole 5 extends towards the interior of the pad body 3 but does not penetrate through the first pad surface 1. At this time, the top wall 9 can be connected to the top wall of the countersunk hole to reinforce the strength of the top wall, and further prevent the movement of the elastic module 7 in the axial direction of the receiving hole 5. Alternatively, the receiving hole 5 may penetrate through the pad body 3 in thickness, i.e., the receiving hole 5 extends from the second pad surface 2 to the first pad surface 1. In the case, the receiving hole 5 can receive a portion of the elastic module 7 as many as possible.

[0050] In the axial direction of the receiving hole 5, the top wall 9 may be located at any appropriate position in the receiving hole 5 as long as a portion of the elastic module 7 is allowed to enter the receiving hole 5. For example, in some embodiments, referring to Fig. 9, the receiving hole 5 penetrates through the pad body in thick-

ness, the top wall 9 is arranged at the opening of the receiving hole 5 which is located on the first pad surface 1, and the outer surface of the top wall 9 is flush with the first pad surface 1. In this way, a portion of the elastic module 7 is allowed as many as possible to enter the receiving hole 5, to restrict the movement of the elastic module 7 in the transverse direction in a better effect. Since the outer surface of the top wall 9 is flush with the first pad surface 1, this can avoid forming pockets on the first pad surface 1 due to the presence of the receiving holes 5, to thus improve the flatness of the first pad surface 1.

[0051] In the balancing pad 10, the protective lining 8 may be bonded, ultrasonically welded, fastened via magic fasteners, or connected in other manners, to the second pad surface 2. The protective lining 8 may be a single sheet, or may be laminated multiple sheets.

[0052] In the balancing pad 10, a dimension of a cross section of the receiving hole 5 may be identical in the axial direction thereof, i.e., the receiving hole 5 may be a hole consistent in diameter, so that the portion of the elastic module 7 can abut against the top wall 9 after entering the receiving hole 5. Alternatively, the dimension of the cross section of the receiving hole 5 may be varied in the axial direction thereof to form a stop flange within the receiving hole 5, so that the portion of the elastic module 7 can abut against the stop flange after entering the receiving hole 5. Alternatively, referring to Fig. 9, the dimension of the receiving hole 5 is gradually increased in the direction from the first pad surface 1 to the second pad surface 2, to form a frustum hole. Since the dimension of the cross section of the frustum hole is tapered in the direction towards the first pad surface 1, the top wall 9 can seal the small port of the frustum hole. In practice, the portion of the elastic module 7 can abut against the conical inner peripheral surface of the receiving hole 5 after entering the receiving hole 5. Optionally, as matching the frustum hole, the elastic module 7 may be formed as a frustum, where the cone slope of the frustum may be identical to that of the receiving hole 5. In this way, a portion of the frustum can be fit into the frustum hole in shape, to form cone-fit therebetween. Therefore, the portion of the elastic module 7 can mate with the receiving hole 5 in a more stable and more reliable manner, so that the balancing pad 10 can provide more stable and more reliable restriction. In addition, the receiving hole 5 may be a square hole, or may be a round hole. For example, the receiving hole may be a square or round frustum hole.

[0053] The shape of the recessed portion is consistent with that of the receiving hole 5 such that the sidewall of the recessed portion can fully fit with the inner peripheral surface of the receiving hole 5.

[0054] In the balancing pad 10, the pad body 3 may not be elastic, for example, which may be a thin plastic panel, and the protective lining 8 may be a plastic cloth with a predetermined thickness that may be bonded to and laid over a side surface of the thin plastic panel and recessed into the receiving holes. Alternatively, the pad

body 3 is an elastic body, and the protective lining 8 is a flexible sheet. In the case, the flexible sheet can be laid over or connected to the second pad surface 2 of the elastic body via an adhesive or by ultrasonic welding.

After the elastic body is laid over the elastic base pad 4 to form an elastic pad 12, when the elastic pad is subject to a pressure, the elastic module 7 is compressed correspondingly to provide a support. Since the pad body 3 is an elastic body and the protective lining 8 is flexible, the elastic body 3 is correspondingly elastically deformed to provide a buffer, and the protective lining 8 is also deformed accordingly, to further restrict the movement of the respective elastic module 7 in the transverse direction while effectively improving the stability of the elastic pad 12 when being subject to a pressure. In this way, the elastic pad 12 can provide a higher comfort.

[0055] The elastic body may be of multiple types. For example, the elastic body may be a silicone body. Alternatively, the elastic body may be a sponge body, for example, a sponge body with a high elasticity, which can be easily formed in a desired shape, has a low cost, and is advantageous in breathability. In addition, the flexible sheet may be of multiple types. For example, the flexible sheet may be a plastic cloth with a predetermined thickness. Alternatively, the flexible sheet may be a fabric, for example, canvas or non-woven fabric. The non-woven fabric can introduce good moisture-proof and breathable properties to the balancing pad, and can also make the balancing pad more flexible and thinner. This can further make the elastic pad more comfortable.

[0056] In addition, the present disclosure provides an elastic pad. Referring to Fig. 10, the elastic pad 12 includes an elastic base pad 4 and the balancing pad 10 according to any one of the embodiments as described above, wherein: the elastic base pad 4 includes a plurality of elastic modules 7; the balancing pad 10 is laid over the elastic base pad 4, and a portion of each elastic module 7 is located within the respective receiving hole 5; and the receiving hole 5 can restrict the movement of the elastic module 7 in the transverse direction. As aforementioned, when laid over the elastic base pad, the balancing pad restricts the movement of each elastic module in the transverse direction, to thus effectively improve the stability of the elastic pad when being subject to a pressure. Therefore, the elastic pad can provide higher comfort.

[0057] The elastic module 7 may be of multiple types. For example, the elastic module 7 may be a shape of a cylinder, truncated cone, or column. In some embodiments, referring to Fig. 10, the elastic module 7 is in a truncated conical shape and is fit within the receiving hole 5 in a form of a truncated conical hole. As such, the truncated cone-shaped elastic module 7 has the same cone slope as the receiving hole 5 in the form of a truncated cone, to thus form a form-fit match between conical surfaces of the elastic module 7 and the receiving hole 5. Accordingly, the portion of the elastic module 7 can be mated with the receiving hole 5 more stably and more

reliably, and the balancing pad 10 can provide more stable and more reliable restriction for the elastic module 7.

[0058] The elastic module 7 may be of multiple types. For example, the elastic module 7 may be a cylindrical elastic block such as a rubber block. Alternatively, the elastic module 7 may include a spring support 14 and a conical spring 15 disposed within the spring support 14. In the case, the elastic base pad 4 may include a foldable mounting bracket, and the spring bracket 14 is used for removably mounting the elastic module 7 to the foldable mounting bracket. In this way, a plurality of elastic modules 7 can be mounted to the foldable mounting bracket via the respective spring supports 14. Then, the balancing pad 10 is laid over the respective elastic modules 7, and a portion of each elastic module 7 enters and is located within the respective receiving hole 5. When disassembling is to be performed, the balancing pad 10 is removed, the respective elastic modules 7 are removed from the foldable mounting bracket and sequentially stacked on and nested in the corresponding ones, and the foldable mounting bracket is then folded. Therefore, the elastic module 12 is easily removed, and the disassembled elastic modules can be compressed or stacked and nested each other together, thus significantly saving the storage and transportation space and offering convenience in cleaning.

[0059] Referring to Fig. 10, the elastic pad 12 further includes an outer cover 13 covering the balancing pad 10 and wrapping the balancing pad 10 and at least portion of the elastic base pad 4. For example, the elastic base pad 4 and the balancing pad 10 can be wrapped as a whole, improving the appearance of the elastic pad 12. The outer cover 13 can wrap the balancing pad 10 and the at least portion of the elastic base pad 4 via a removable connection structure, for example, zippers or magic fasteners.

[0060] Furthermore, the present disclosure provides a furniture, including the elastic pad 12 according to any one of the embodiments as described above. The furniture includes, but is not limited to, a mattress, a sofa, a chair, a sofa bed, an upholstered bench and the like.

[0061] The scope of protection of the present disclosure is defined only by the appended claims. Given the teaching of the present disclosure, those skilled in the art could easily envision using alternative structures of those disclosed herein as feasible alternative embodiments, and combining the embodiments disclosed herein to form new embodiments, which should all fall into the scope defined by the appended claims.

Claims

1. A balancing pad in use with elastic modules, the balancing pad (10) comprising:

a pad body (3) comprising a first pad surface (1) and a second pad surface (2) opposite to the

first pad surface in a thickness direction of the pad body, the second pad surface (2) is faced an elastic base pad (4) and is configured to have a plurality of receiving holes (5) spaced apart and extending towards an interior of the pad body;

a protective sheet (6) laid over and connected with the first pad surface (1);

wherein each of the plurality of receiving holes (5) is configured to receive a portion of a corresponding elastic module (7) on the elastic base pad (4) to restrict movement of the corresponding elastic module (7) in a transverse direction of the pad body (3).

2. The balancing pad in use with elastic modules according to claim 1, wherein the receiving hole (5) penetrates through the pad body in thickness, and the protective sheet (6) covers the plurality of the receiving holes (5).
3. The balancing pad in use with elastic modules according to claim 1, wherein a dimension of a cross section of the receiving hole is set to gradually increase in a direction from the first pad surface (1) to the second pad surface (2).
4. The balancing pad in use with elastic modules according to claim 1, wherein the pad body (3) is an elastic body, and the protective sheet (6) is a flexible sheet.
5. The balancing pad in use with elastic modules according to claim 4, wherein the elastic body is a sponge body, and the flexible sheet is a non-woven fabric sheet.
6. The balancing pad in use with elastic modules according to any one of claims 1-5, wherein the balancing pad comprises a protective lining (8) which is laid over and connected with the second pad surface (2) and comprises recessed portions recessed into the respective receiving holes (5), each of the recessed portions includes a top wall (9) and a sidewall (11) around the top wall (9), the sidewall (11) and an inner peripheral surface of the receiving hole (5) are fit and connected with each other, the top wall (9) faces towards the first pad surface (1), and the pad body (3) is wrapped between the protective sheet (6) and the protective lining (8).
7. The balancing pad in use with elastic modules according to claim 6, wherein the top wall (9) and the protective sheet (6) are connected with each other.
8. The balancing pad in use with elastic modules according to claim 6, wherein the protective lining (8) is formed of a material as the same as that of the

protective sheet (6); and/or
the recessed portion is consistent with the receiving
hole (5) in shape.

9. A balancing pad in use with elastic modules, the bal- 5
ancing pad comprising:

a pad body (3) comprising a first pad surface (1)
and a second pad surface (2) opposite to the 10
first pad surface in a thickness direction of the
pad body, the second pad surface (2) is faced
an elastic base pad (4) and is configured to have
a plurality of receiving holes (5) spaced apart
and extending towards an interior of the pad
body;
a protective lining (8) laid over and connected 15
with the second pad surface (2) and comprising
recessed portions recessed into the respective
receiving holes (5), each of the recessed por-
tions comprising a top wall (9) and a sidewall 20
(11) around the top wall (9), the sidewall (11)
and an inner surface of the receiving hole (5)
being fit and connected with each other, the top
wall (9) faces the first pad surface (1);
wherein each of the receiving holes (5) is con- 25
figured to receive a portion of a corresponding
elastic module (7) of the elastic base pad (4) to
restrict movement of the corresponding elastic
module in a transverse direction of the pad body
(3). 30
10. The balancing pad in use with elastic modules ac-
cording to claim 9, wherein the receiving hole (5)
penetrates through the pad body in thickness, the 35
top wall (9) is disposed at an opening of the receiving
hole (5) which is located at the first pad surface (1),
and an outer surface of the top wall (9) is flush with
the first pad surface (1).
11. The balancing pad in use with elastic modules ac- 40
cording to claim 9, wherein a dimension of a cross
section of the receiving hole is set to gradually in-
crease in a direction from the first pad surface (1) to
the second pad surface (2); and/or
the recessed portion is consistent with the receiving 45
hole (5) in shape.
12. The balancing pad in use with elastic modules ac-
cording to any one of claims 9-11, wherein the pad
body (3) is an elastic body, and the protective lining 50
(8) is a flexible sheet.
13. The balancing pad in use with elastic modules ac-
cording to claim 12, wherein the elastic body is a
sponge body, and the flexible sheet is a non-woven 55
fabric sheet.
14. An elastic pad (12) comprising:

an elastic base pad (4) comprising a plurality of
elastic modules (7); and
the balancing pad (10) according to any one of
claims 1-13;

wherein the balancing pad (10) is laid over the
elastic base pad (4), and a portion of each of the
plurality of elastic modules (7) is received and
located within a corresponding one of the receiv-
ing holes (5), wherein the receiving hole (5) can
restrict movement of the plurality of elastic mod-
ules (7) in a transverse direction of the pad body
(3).

15. The elastic pad according to claim 14, wherein the
elastic module (7) is in a truncated conical shape
and is fit within the receiving hole (5) in a form of a
truncated conical hole.
16. The elastic pad according to claim 14 or 15, wherein
the elastic pad further comprises an outer cover (13)
covering the balancing pad (10) and wrapping the
balancing pad (10) and at least a portion of the elastic
base pad (4).
17. A furniture, comprising the elastic pad (12) according
to any one of claims 14-16.

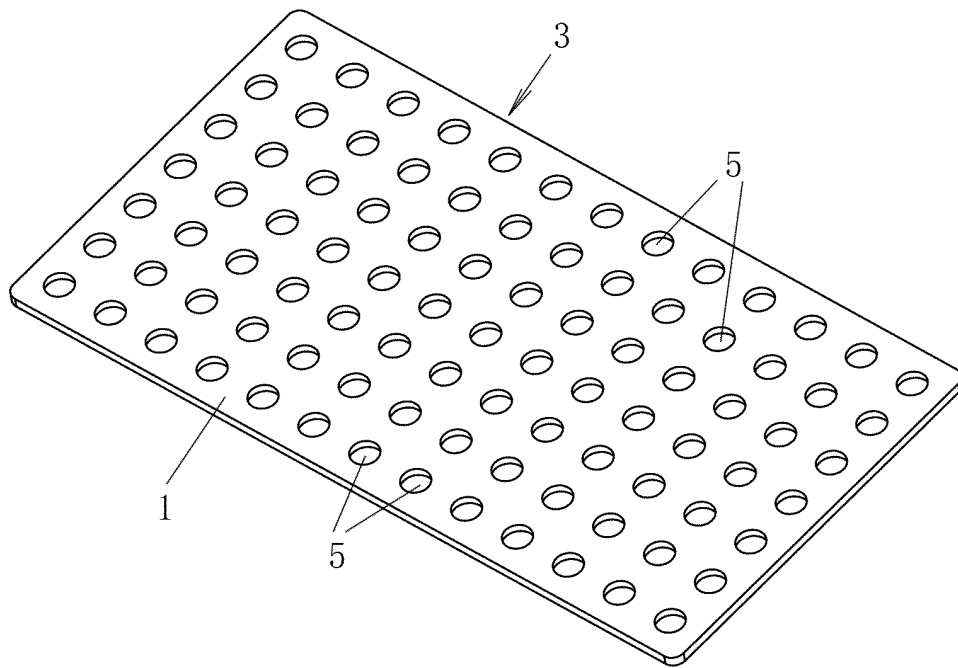


Fig. 1

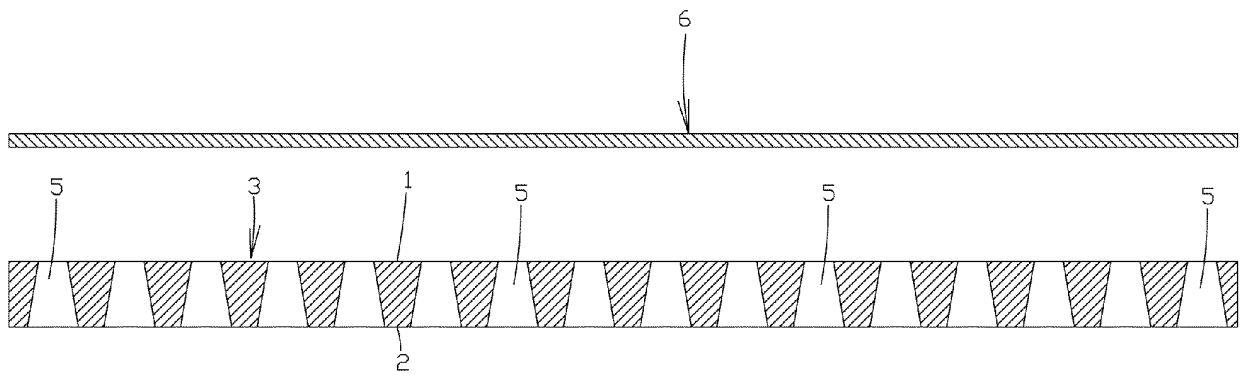


Fig. 2

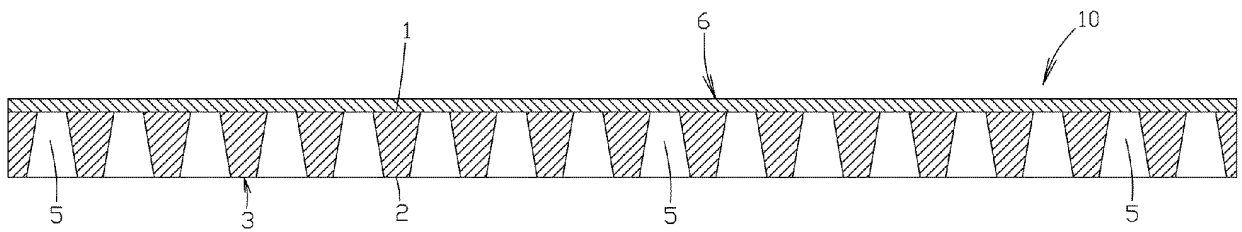


Fig. 3

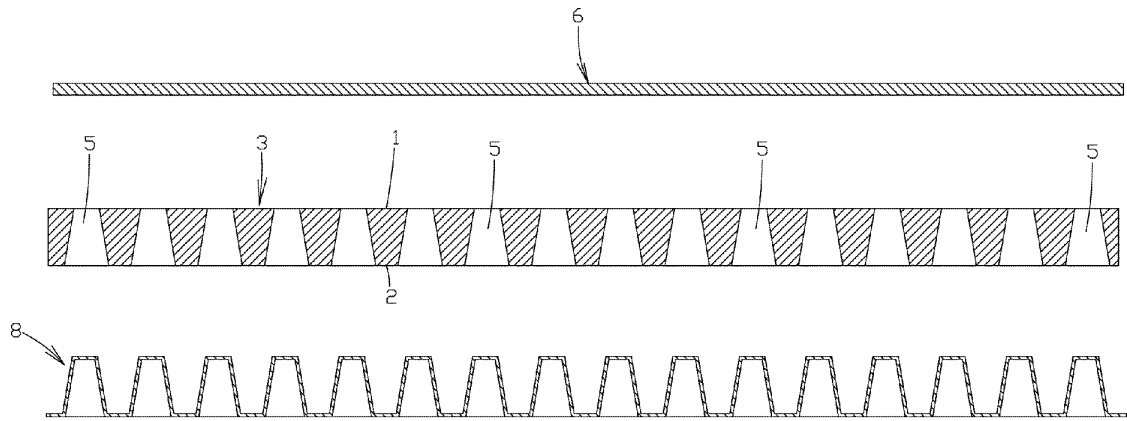


Fig. 4

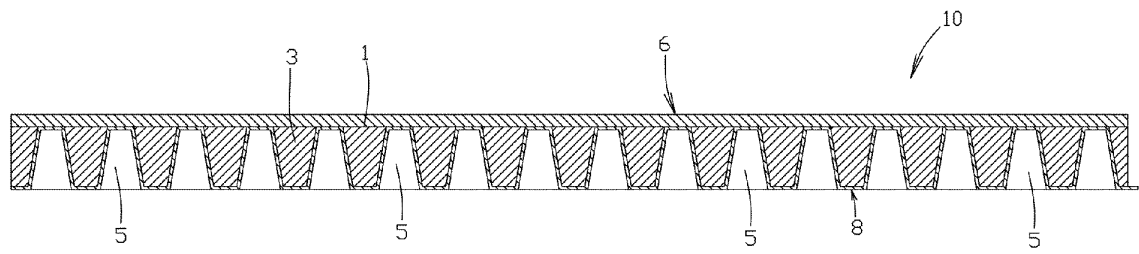


Fig. 5

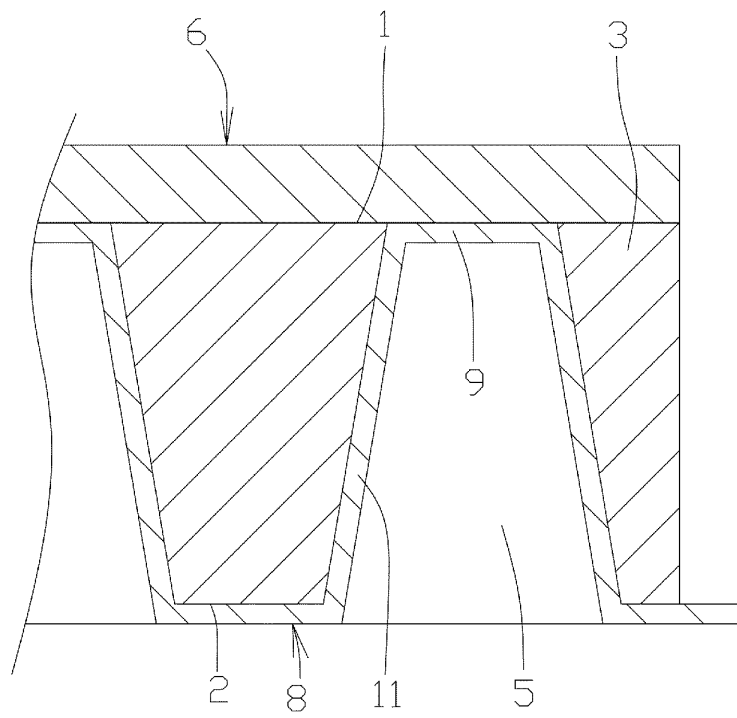


Fig. 6

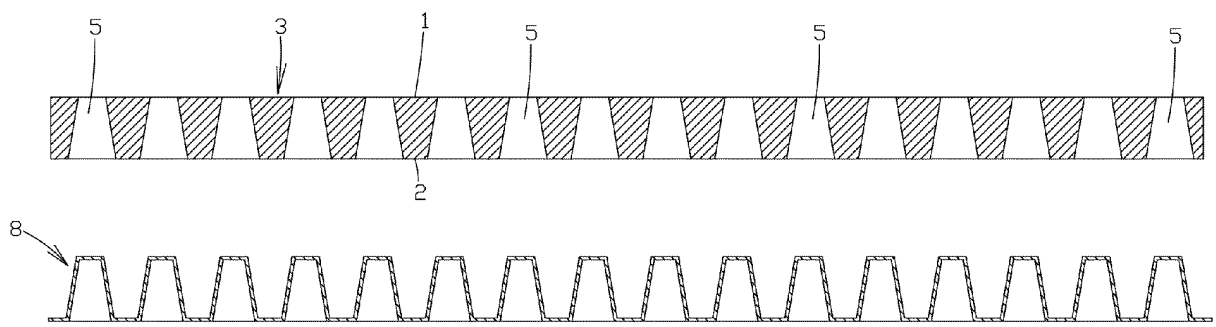


Fig. 7

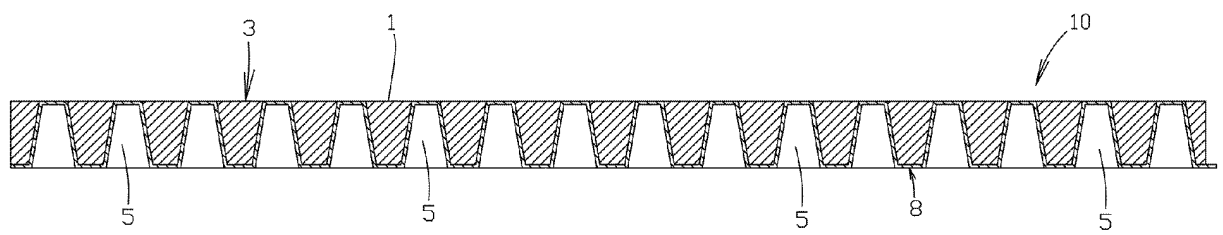


Fig. 8

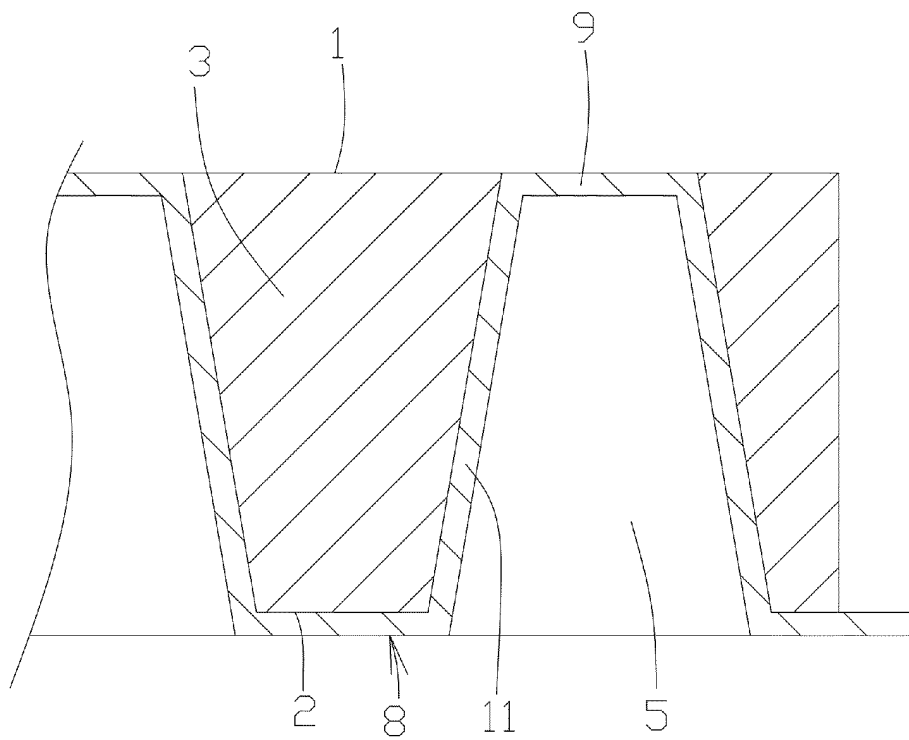


Fig. 9

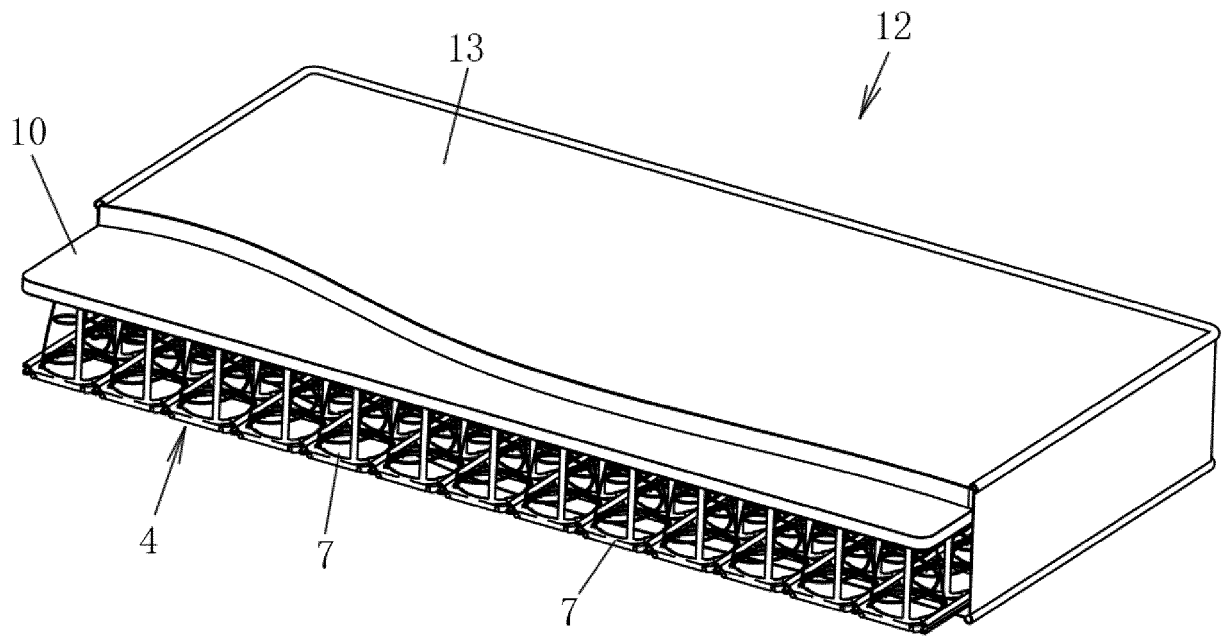


Fig. 10

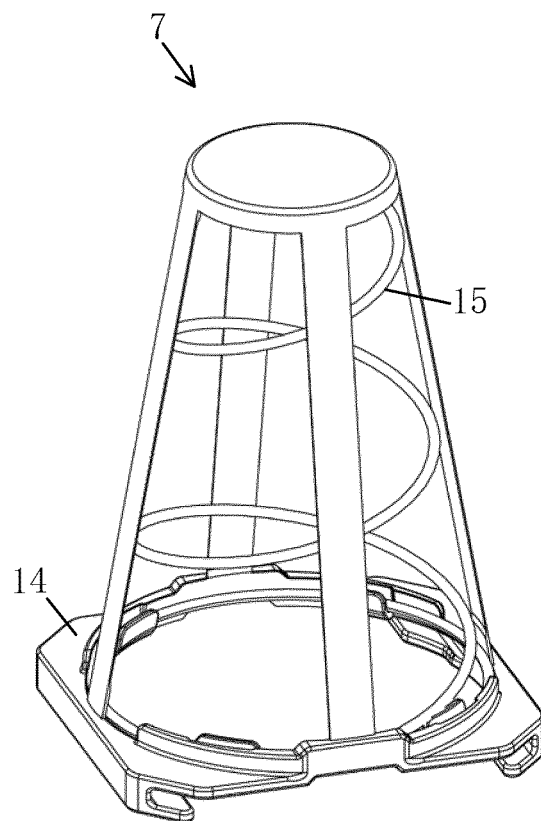


Fig. 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/110300

A. CLASSIFICATION OF SUBJECT MATTER

A47C 27/05(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT, CNABS, ENTXTC, VEN: 垫, 床垫, 平衡垫, 孔, 腔体, 容纳, 弹性, 弹簧, contain, spring, elastic, hole, chamber, mattress

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 215533110 U (NEW TEC INTEGRATION XIAMEN CO., LTD.) 18 January 2022 (2022-01-18) claims 1-17	1-17
X	CN 112674541 A (NEW TEC INTEGRATION XIAMEN CO., LTD.) 20 April 2021 (2021-04-20) claims 1-27, and figures 41A-41D	1-17
X	CN 213757509 U (XILINMEN FURNITURE CO., LTD.) 23 July 2021 (2021-07-23) description, paragraphs 0003-0024, and figures 1-2	1-17
A	CN 205457541 U (FUJIAN QUANZHOU DAFUHAO FURNITURE CO., LTD.) 17 August 2016 (2016-08-17) entire document	1-17
A	JP 2006014819 A (INOUE MTP K. K.) 19 January 2006 (2006-01-19) entire document	1-17
A	DE 9107478 U1 15 October 1992 (1992-10-15) entire document	1-17

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“E” earlier application or patent but published on or after the international filing date

“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

21 September 2022

Date of mailing of the international search report

28 September 2022

Name and mailing address of the ISA/CN

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Facsimile No. (86-10)62019451

Authorized officer

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/110300

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	215533110	U	18 January 2022	None			
CN	112674541	A	20 April 2021	CN	112674540	A	20 April 2021
				CN	112674537	A	20 April 2021
				CN	112674542	A	20 April 2021
				CN	112674535	A	20 April 2021
				CN	112674538	A	20 April 2021
				CN	112674543	A	20 April 2021
				CN	112674536	A	20 April 2021
				CN	112674544	A	20 April 2021
				CN	112674539	A	20 April 2021
CN	213757509	U	23 July 2021	None			
CN	205457541	U	17 August 2016	None			
JP	2006014819	A	19 January 2006	None			
DE	9107478	U1	15 October 1992	DE	9107476	U1	15 October 1992

Form PCT/ISA/210 (patent family annex) (January 2015)