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(71) Applicant: **Bestway Inflatables & Material Corp.**
Shanghai 201812 (CN)

(72) Inventor: **ZENG, Xianglin**
Shanghai 201812 (CN)

(74) Representative: **Inchingalo, Simona**
Bugnion S.p.A.
Viale Lancetti, 17
20158 Milano (IT)

(54) **INFLATABLE BED**

(57) An inflatable bed includes an inflatable body having a top sheet, a bottom sheet, and a lateral confining sheet connected to the top sheet and the bottom sheet. A covering that covers the top sheet includes at least one outer layer and an inner layer connected to the outer layer. The periphery of the outer layer is fixedly or detachably connected to the inflatable body, and the periphery of the outer layer extends to the periphery of the top sheet. The inflatable bed with the covering according to the advantages that the overall structure of the covering is simple, and the covering is convenient to manufacture and low in cost. The outer layer of the covering can be conveniently connected to the inflatable body of the inflatable bed in a fixed or detachable manner, so that the covering will not slip during use and meets the need for good comfort.

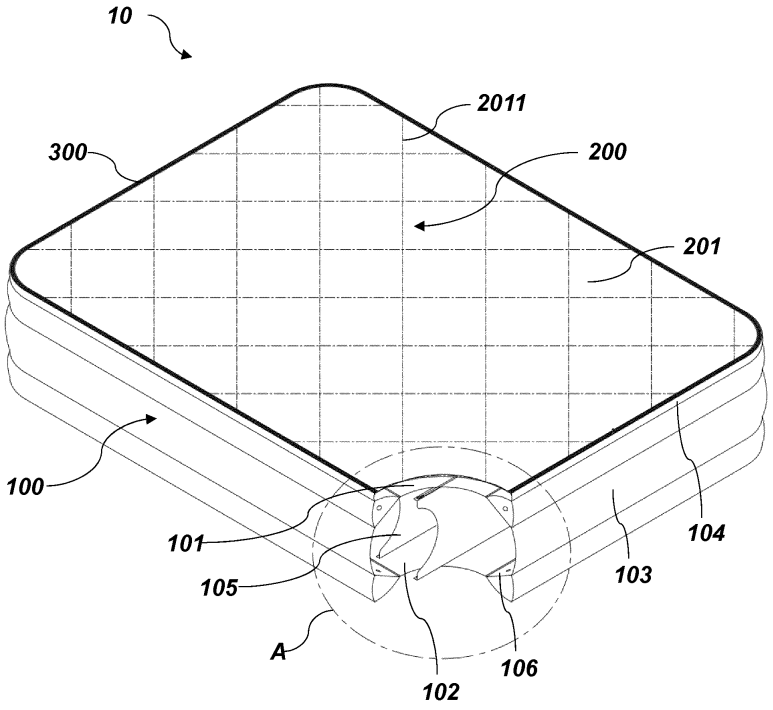

Fig. 4

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to inflatable products. More particularly, the present disclosure relates to an inflatable bed with a covering.

BACKGROUND

[0002] Inflatable beds, and other inflatable products on which people lie down and/or rest, are favored by consumers due to the advantages of being lightweight, storable, portable, convenient to use, and the like. During use, in order to ensure comfort, improve the thermal insulation property, and meet other needs, consumers typically use a variety of coverings, such as pads, blankets, and the like, on the contact surface of the inflatable bed. However, these coverings can easily slip, slide, or otherwise become removed from the contact surface in the absence of additional fastening devices. Accordingly, it can be difficult to ensure and maintain the improved comfort provided by these coverings.

[0003] Some inflatable beds include inflatable bodies with inflatable chambers, as well as their own coverings, which are laid over the inflatable bodies in a fixed or detachable manner. For these inflatable beds, the coverings can provide an important influence on the diversity, aesthetics, and comfort of the beds. However, the layered structure of the covering, the selection of materials, the production process, the connection of the covering to the inflatable body with the inflatable chambers, etc. can be difficult and costly for manufacturers of inflatable beds, and there is accordingly still a need for further improvements.

SUMMARY

[0004] It is an object of the present disclosure to provide an improved inflatable bed with a covering.

[0005] According to an aspect of the disclosure, an inflatable bed includes: an inflatable body having a top sheet, a bottom sheet, a lateral confining sheet connected to the top sheet and the bottom sheet; a covering connected to the inflatable body and disposed over the top sheet. The covering includes at least one outer layer and an inner layer connected to the outer layer. A periphery of the at least one outer layer is fixedly or detachably connected to the inflatable body, and the periphery of the at least one outer layer extends to a periphery of the top sheet.

[0006] Compared with the existing inflatable beds, the inflatable bed with a covering according to the present disclosure has the advantage that the overall structure of the covering is simple, and the covering is easy to manufacture and low in cost; moreover, the outer layer of the covering is easily connected to the inflatable body of the inflatable bed in a fixed or detachable manner, such that the covering will not slip during use and meets the need for good comfort.

[0007] According to the above, the present disclosure may further include one or more of the following features.

[0008] In one aspect, the at least one outer layer of the covering includes a first outer layer and a second outer layer, wherein the periphery of the first outer layer is connected to the periphery of the second outer layer, and the inner layer is disposed between the first outer layer and the second outer layer.

[0009] In some optional forms, the at least one outer layer of the covering includes only a single outer layer, and the inner layer is connected to a bottom surface of the single outer layer.

[0010] In some optional forms, the at least one outer layer is connected to the inner layer by ultrasonic welding or quilting.

[0011] In some optional forms, the periphery of the at least one outer layer is fixedly connected to the inflatable body by welding.

[0012] In another optional form, the periphery of the at least one outer layer is detachably connected to the inflatable body via a detachable mechanism, such as a zipper, a reclosable fastener, or a snap fastener.

[0013] In some optional forms, the at least one outer layer is a polymer material layer and includes polyvinyl chloride, thermoplastic polyurethane elastomer, polyurethane, polypropylene, polyethylene, polyethylene terephthalate, and/or nylon.

[0014] In some optional forms, the at least one outer layer is a fabric layer and includes cotton fiber, wool fiber, silk fiber, hemp fiber, regenerated fiber, polyester fiber, polyamide fiber, polyacrylonitrile fiber, polyvinyl alcohol fiber, polypropylene fiber, polyurethane fiber, and/or inorganic fiber.

[0015] In some optional forms, the inner layer is a fabric layer and includes cotton fiber, wool fiber, viscose fiber, acetate fiber, polyester fiber, polyamide fiber, polyacrylonitrile fiber, polyvinyl alcohol fiber, polypropylene fiber, or polyurethane fiber.

[0016] In some optional forms, the periphery of the top sheet is connected to a top edge of the lateral confining sheet, the periphery of the bottom sheet is connected to a bottom edge of the lateral confining sheet, and the inflatable body further includes an extension belt that extends out from the top edge of the lateral confining sheet, and the periphery of the outer layer is connected to the extension belt.

[0017] In some optional forms, the extension belt and the lateral confining sheet are made from the same sheet of material and define a unitary structure as one piece.

[0018] In some optional forms, the extension belt is made from a separate sheet material and is connected to the lateral confining sheet by welding or other connection methods.

[0019] In some optional forms, the top sheet, the bottom sheet, the lateral confining sheet, and the extension belt are made of polyvinyl chloride, thermoplastic poly-

urethane elastomer, polyurethane, polypropylene, polyethylene, polyethylene terephthalate, and/or nylon.

[0020] In some optional forms, the inflatable body further includes a plurality of first tensioning members disposed within the inflatable body and that connect the top sheet to the bottom sheet.

[0021] In some optional forms, the inflatable body further includes a plurality of second tensioning members, and each of the plurality of second tensioning members connects either the top sheet to the lateral confining sheet or connects the bottom sheet to the lateral confining sheet.

[0022] In some optional forms, the inner layer fills a space defined between the first outer layer and the second outer layer.

[0023] In some optional forms, the covering includes a detachable mechanism configured to detachably connect the periphery of the covering to the periphery of the top sheet, wherein the covering is reversible such that first outer layer is outwardly exposed when the covering is connected in a first state and the second outer layer is outwardly exposed when the covering is connected in a second state, wherein the second state is reversed relative to the first state.

[0024] In some optional forms, the covering is fixedly connected to the inflatable body, and the inner layer is disposed between the single outer layer and the top sheet, wherein the inner layer is adjacent the top sheet.

[0025] In some optional forms, the inflatable bed further includes a connecting strip extending around the periphery of the top sheet and having an outer periphery connected to the extension belt and an inner periphery connected to the covering, wherein the connecting strip overlaps the top sheet along an outer peripheral area of the top sheet, wherein the covering has a surface area that is smaller than a surface area of the top sheet, where a surface area of the connecting strip and the surface area of the covering combine to overlap and cover the entire surface area of the top sheet.

[0026] In some optional forms, the outer periphery of the connecting strip is fixedly attached to the extension belt and the inner periphery of the connecting strip is detachably connected to the covering.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Other features and advantages of the present disclosure will be understood from the following embodiments described in detail herein and with reference to the accompanying drawings, in which like reference numerals represent the same or similar components.

FIG. 1 is a schematic perspective diagram of an inflatable bed according to a first embodiment of the present disclosure;

FIG. 2 is a partial schematic cut-away diagram of the inflatable bed according to the first embodiment;

FIG. 3 is a partial schematic exploded diagram of the inflatable bed according to the first embodiment;

FIG. 4 is another partial schematic cut-away diagram of the inflatable bed according to the first embodiment;

FIG. 5 is an enlarged schematic diagram of an area A in FIG. 4;

FIG. 6 is a schematic perspective diagram of an inflatable bed according to a second embodiment of the present disclosure;

FIG. 7 is a partial schematic cut-away diagram of the inflatable bed according to the second embodiment;

FIG. 8 is a partial schematic cut-away diagram of a covering of an inflatable bed according to a third embodiment of the present disclosure;

FIG. 9 is a partial schematic sectional diagram of the covering of the inflatable bed according to the third embodiment, in which a pressing die is shown;

FIG. 10 is a partial schematic sectional diagram of a covering of an inflatable bed according to a fourth embodiment of the present disclosure, in which a pressing die is shown; and

FIG. 11 is a partial schematic exploded diagram of the inflatable bed according to a fifth embodiment.

[0028] Elements in the figures are shown for simplicity and clarity and are not necessarily drawn to exact scale. It can be understood that these accompanying drawings are not only intended to explain and illustrate the present disclosure and description, but also contribute to the scope of the present disclosure.

DETAILED DESCRIPTION

[0029] The implementation and application of the embodiments will be discussed in detail below. However, it will be understood that the specific embodiments discussed and illustrated herein illustratively describe various embodiments, implementation, and application of the present disclosure, and are not intended to limit the scope of the present disclosure.

[0030] In the description, the expressions indicating orientations such as upper, lower, top, bottom, inner, outer, etc., which are used for describing the structural positions of various components, are not absolute but relative. The expressions indicating orientations are appropriate when the various components are arranged as shown in the figures, but change accordingly when the positions of the components in the figures change.

[0031] In the description, unless expressly stated or limited otherwise, the terms such as "connection", "connected", etc. should be interpreted broadly, for example, either fixed or detachable connection, or integration; or may be a direct connection or an indirect connection by way of an intermediate medium, or may be communication between interiors of two elements or interaction between the two elements. For those skilled in the art, the specific meaning of the above terms in the description will be understood according to specific circumstances.

First Embodiment

[0032] FIG. 1 to FIG. 5 show an inflatable bed 10 and components thereof, according to a first embodiment of the present disclosure. In the illustrated embodiment, the inflatable bed 10 is substantially rectangular on the whole. However, this is merely illustrative, and the shape of the inflatable bed 10 is not limited in the present disclosure. In some variants, the inflatable bed 10 may also be arranged in any other appropriate shapes, such as a substantially circular shape, a substantially oval shape, and various regular or irregular polygonal shapes.

[0033] As shown in FIG. 1 to FIG. 5, the inflatable bed 10 includes an inflatable body 100 and a covering 200 fixedly or detachably connected to the inflatable body 100. According to an aspect of the disclosure, and as well shown in figures 4 and 5, the inflatable body 100 includes a top sheet 101, a bottom sheet 102, a lateral confining sheet 103, an extension belt 104, a plurality of first tensioning members 105, and a plurality of second tensioning members 106. The inflatable body 100 may also be referred to as an inflatable chamber, and may include various arrangements of internal spaces or chambers that may be inflated and deflated as desired to adjust the comfort of the inflatable bed 10. The inflatable body 100 may be inflated via a variety of inflation processes. It will be appreciated that various aspects of the disclosure may also be applicable to other types of beds or leisure structures not explicitly disclosed herein.

[0034] The top sheet 101 may be considered to be the upper portion or top portion of the inflatable body 100. The bottom sheet 102 may be considered to be a lower portion or bottom portion.

[0035] The lateral confining sheet 103, or more easily lateral sheet, extends generally around the periphery of the inflatable bed 10 and defines the lateral periphery of the inflatable body 100. The extension and profile of the lateral confining sheet 103 essentially defines the shape and profile of the inflatable bed 10. For instance, the lateral sheet may extend around in rectangular manner to define a rectangular bed shape, or may extend in a circular path to define a circular bed shape. The lateral confining sheet 103 is shown extending in a generally vertical direction, extending between the top sheet 101 and the bottom sheet 102. However, the lateral sheet 103 may also extend in a generally angled direction relative to the vertical direction. For instance, the top sheet 101 may be smaller than the bottom sheet 102, with the lateral confining sheet 103 tapering inward, for example.

[0036] The periphery of the top sheet 101, such as its outer edge, is connected to the periphery of the bottom sheet 102, such as its outer edge, by way of the lateral confining sheet 103. More specifically, the periphery of the top sheet 101 is connected to a top edge of the lateral confining sheet 103 by, for example, welding, and the periphery of the bottom sheet 102 is connected to a bottom edge of the lateral confining sheet 103 by, for example, welding, such that the top sheet 101, the bottom sheet 102, and the lateral confining sheet 103 jointly define the inflatable body 100, having one or more inflatable chambers therein.

[0037] The extension belt 104 extends upwards from the top edge of the lateral confining sheet 103, and is provided and configured to be connected to the covering 200. More specifically, the length/height of the extension belt 104 extending upwards from the top edge of the lateral confining sheet 103 may be 1 cm to 4 cm, preferably about 2 cm, thereby providing a sufficient operating space to a manufacturer to connect the extension belt 104 to the covering 200. It will be appreciated, however, that other sizes and lengths/heights of the extension belt 104 may be used.

[0038] In some embodiments, the extension belt 104 and the lateral confining sheet 103 are made from the same sheet of material. Put another way, the sheet of material of the confining sheet 103 extends upwards from the bottom sheet 102 toward the top sheet 101 and beyond the top sheet 101, with the material extending beyond the top sheet 101 being the extension belt 104.

[0039] In some other embodiments, the extension belt 104 is made from a separate sheet of material and is connected to the top edge of the lateral confining sheet 103 by welding. The extension belt 104 in these embodiments may also be attached to the top sheet 101. The separate extension belt 104 may also be attached in other ways.

[0040] With reference to the FIGS. 4 and 5, the plurality of first tensioning members 105 and shown extending parallel along a width direction of the inflatable body 100 and are disposed uniformly within the inflatable body 100 along a length direction of the inflatable body 100. However, it will be appreciated that the tensioning members 105 may extend in other directions of the illustrated shape of the inflatable body, for instance perpendicular to the direction illustrated, or at an oblique angle from the direction illustrated. Additionally, it will be appreciated that other shapes of the inflatable body may include different orientations of the tensioning members 105. The first tensioning members 105 may also be arranged at unequal spacing.

[0041] A top edge of each first tensioning member 105 of the plurality of first tensioning members 105 is connected to the top sheet 101 by, for example, welding, and a bottom edge of each first tensioning member 105 of the plurality of first tensioning members 105 is connected to the bottom sheet 102 by, for example, welding, so as to tension the inflatable body 100 after inflation. Put another way, as the inflatable body is inflated and expends, the outward forces caused by the inflation will put the tensioning members 105 in tension, and will limit the outward/upward/downward expansion of the top and bottom sheets 101, 102, thereby maintain a generally flat surface and shape at the top and bottom of the inflatable body.

[0042] With continued reference to FIGS. 4 and 5, the inflatable bed 10 further includes second tensioning members 106 disposed within the inflatable body 100.

In one aspect, an outer edge of each second tensioning member 106 of the plurality of second tensioning members 106 (also referred to as diagonal tensioning members) is connected to the lateral confining sheet 103 by, for example, welding, and an inner edge of each second tensioning member 106 of the plurality of second tensioning members 106 is connected to the top sheet 101 or the bottom sheet 102 by, for example, welding, so as to further optimize the mechanical properties of the inflatable body 100. Each second tensioning member 106 of these second tensioning members 106 includes at least one air hole 1061 to avoid dividing the inflatable body 100, such that inflation air can reach the internal chamber defined in the generally triangular space defined between the top sheet 101 or bottom sheet 102, lateral confining sheet 103, and second tensioning member 106. It will be appreciated that the inflatable body 100 may still be divided into multiple chambers, but as illustrated is formed as a single main inflation chamber having fluid communication past/through the first and second tensioning members 105, 106, such that inflation air may inflate the space delimited by the top sheet 101, bottom sheet 102, and lateral confining sheet 103.

[0043] In the illustrated embodiment, the inflatable body 100 includes two second tensioning members 106, one of the second tensioning members 106 connecting the lateral confining sheet 103 to the top sheet 101, and the other second tensioning member 106 connecting the lateral confining sheet 103 to the bottom sheet 102, so as to form a three-layer structure within the inflatable body 100. In some implementation variants, the inflatable body 100 may include a greater number of second tensioning members 106 to form a more-layer structure.

[0044] The second tensioning members 106 may extend continuously along the upper and lower periphery of the inflatable body 100, in one aspect, or may be separate and extend along distinct sides/edges of the inflatable body (such as using four tensioning members along all four upper edges of a rectangular shape and four tensioning members along all four bottom edges of a rectangular shape). Other combinations may also be used, such as a tensioning member 106 extending continuously along some but not all of the edges. The length and arrangement of the tensioning members 106 may be different along the upper periphery relative to the lower periphery.

[0045] With reference again to the first tensioning members 105, it is to be understood that the shape of the first tensioning members 105 is not limited in the present disclosure. These tensioning members 105 may be C-shaped tensioning members, Y-shaped tensioning members, Z-shaped tensioning members, square tensioning members, string-type tensioning members, and any other tensioning members that are suitable for the inflatable body 100, and only need to satisfy sufficient connection strength. Similarly, the second tensioning members 106 may have other shapes.

[0046] In one aspect, taking the top of the inflatable body 100 as an example, in particular as shown in the exploded view of FIG. 3, the first tensioning members 105 (shown extending across the width of the inflatable body) are connected to the top sheet 101 to form a plurality of first weld lines 1011 that are parallel to each other, and the second tensioning members 106 are connected to the top sheet 101 to form a ring-shaped second weld line 1012, the second weld line 1012 encircling these first weld lines 1011 and generally defining an actual usable area of the inflatable body 100 for a person to lie down. It is to be understood that the bottom of the inflatable body 100 may be of the similar structure.

[0047] It will be appreciated that other arrangements and orientations of the first tensioning members 105 and the second tensioning members 106 may result in correspondingly different shapes of the weld lines 1011 and 1012.

[0048] In one aspect, the actual usable area within the second weld line 1012 may be recessed, such that the outer peripheral area of the top sheet 101 slopes downward and inward, as shown in FIG. 3. In another aspect, the upper surface of the top sheet 101 may be generally flat. It will be appreciated that the degree of the slope or the size of the area within the second weld line 1012 may be varied.

[0049] The top sheet 101, the bottom sheet 102, the lateral confining sheet 103, the extension belt 104, the plurality of first tensioning members 105 and the plurality of second tensioning members 106 of the inflatable body 100 are preferably made of a weldable polymer material, and for example, may be made of one or a combination of more of polyvinyl chloride (PVC), thermoplastic polyurethane elastomer (TPU), polyurethane (PU), polypropylene (PP), polyethylene (PE), polyethylene terephthalate (PET), nylon and other suitable polymer materials.

[0050] The inflatable body 100, in a preferred form, has a single internal inflatable space defined therein, with the internal inflatable space being fluidly connected through and around the internal tensioning members 105, 106, and inflatable via as little as one inflation opening in a manner known in the art. However as described above, the inflatable body 100 may also include multiple separate internal inflatable spaces that are fluidically isolated. It will be appreciated that the present disclosure may be applicable to a variety of internal support structures and arrangements of inflatable spaces.

[0051] With reference now to the covering 200, the covering 200 covers at least partially the inflatable body 100, preferably covers the entire top sheet 101 of the inflatable body 100, and includes at least one outer layer 201, 202 capable of being in contact with the human body and an inner layer 203 connected to the outer layer 201.

[0052] In the first embodiment, the covering 200 is a three-layer structure made by quilting. More specifically, the covering 200 comprises a first outer layer 201 oriented upwards, or defining the top of the covering 200, and a second outer layer 202 oriented downwards (lo-

cated on the backside of the illustrated covering 200, see for example figure 9).

[0053] In one aspect, the periphery or outer edge of the first outer layer 201 is connected to the periphery or outer edge of the second outer layer 202 by sewing, and the inner layer 203 is disposed between the first outer layer 201 and the second outer layer 202.

[0054] In one aspect, a plurality of quilting threads 2011 are crosswise distributed diagonally and are connected to both the first outer layer 201 and the second outer layer 202 by quilting. The distribution manner of the plurality of quilting threads 2011 is not restrictive and may be separately determined according to the appearance of the covering 200. For instance, the quilting threads 2011 can be arranged in a grid and extend parallel to the edges of the inflatable body 100. The quilting threads 2011 may be evenly spaced or unevenly spaced.

[0055] In one aspect, the inner layer 203 generally completely fills the space defined between the first and second outer layers 201, 202. The quilting threads 2011 secure the first and second outer layers 201, 202 with the internal inner layer 203.

[0056] In one aspect, the outer layer 201, 202 of the covering 200 is a fabric layer, and for example, is made of one or a combination of more of cotton fiber, wool fiber, silk fiber, hemp fiber, regenerated fiber, polyester fiber, polyamide fiber, polyacrylonitrile fiber, polyvinyl alcohol fiber, polypropylene fiber, polyurethane fiber, and/or inorganic fiber. The inner layer 203 of the covering 200 is also a fabric layer, and for example, is made of one or a combination of more of cotton fiber, wool fiber, viscose fiber, acetate fiber, polyester fiber, polyamide fiber, polyacrylonitrile fiber, polyvinyl alcohol fiber, polypropylene fiber, and/or polyurethane fiber.

[0057] In the first embodiment, the periphery of the outer layer 201 of the covering 200 extends to the periphery of the top sheet 101, and is detachably connected to the extension belt 104 of the inflatable body 100, for example, by a detachable mechanism or zipper 300. More specifically, with reference to FIG. 3, a first half zipper 301 is sewn to a top edge of the extension belt 104, and a second half zipper 302 is sewn to the periphery of the first outer layer 201 and/or the periphery of the second outer layer 202 of the covering 200, so that the two half zippers 301, 302 are engaged to achieve a detachable connection. Thus, a user can mount the covering 200 onto the inflatable body 100 or remove the same from the inflatable body 100 conveniently by means of the zipper 300, and both the first outer layer 201 and the second outer layer 202 of the covering 200 can be arranged upwards or outwardly facing when attached; that is, the covering 200 can be used double-sided. In some implementation variants, the periphery of the outer layer 201, 202 of the covering 200 may also be detachably connected to the extension belt 104 of the inflatable body 100 by other detachable connecting mechanisms such as a reclosable fastener or a snap fastener.

[0058] Furthermore, in the first embodiment, the covering 200 is not limited to the quilted covering illustrated, but the covering 200 may also be, for example, sponge composite fabric, sandwich mesh fabric, or any other comfortable coverings having similar process principles and suitable for use with the inflatable bed 10.

[0059] In one aspect, the covering 200 is connected to the inflatable body 100 around substantially the entire outer periphery of the covering 200 and the inflatable body 100. In the various figures throughout the disclosure, the covering 200 is shown in a broken section, with a corner of the covering 200 removed to illustrate the layered nature of the covering 200 as well as to illustrate the internal features of the inflatable body 100 in some instances. It will be appreciated that these figures are not intended to limit the covering 200 (or the inflatable body 100) to the illustrated partial shape. Indeed, FIG. 1 clearly illustrates the covering 200 overlapping and covering substantially the entire surface area of the top sheet 101 and the inflatable body 100.

[0060] The zipper 300 or other connection type, detachable or fixed, likewise extends substantially around the entire periphery, as shown in FIG. 1. However, it will be appreciated that the zipper 300 may also be arranged to extend around less than substantially the entire periphery, for example as illustrated in the partial cutaway views or other partial extensions around the periphery. In such instances, the covering 200 may still be maintained and secured in place relative to the inflatable body 100.

Second Embodiment

[0061] FIG. 6 and FIG. 7 show an inflatable bed 10 and components thereof, according to a second embodiment of the present disclosure. It can be understood that an inflatable body 100 and a covering 200 of the inflatable bed 10 in the second embodiment are of an overall structure similar to that in the first embodiment, so that the similarity to the first embodiment may be understood with the help of the above detailed descriptions, and will not be repeated in this section. For instance, the tensioning members 105, 106, and quilting threads 2011, and their various possible arrangements and orientations may also be used with the second embodiment, and the various possible shapes and arrangements of the inflatable body and its constituent parts may also be used.

[0062] As shown in FIG. 6 and FIG. 7, the difference from the inflatable bed 10 of the first embodiment is that, in the inflatable bed 10 of the second embodiment, the periphery of an outer layer 201 of the covering 200 extends to the periphery of a top sheet 101 and is fixedly connected to an extension belt 104 of the inflatable body 100, rather than being detachably connected via the zipper 300 or other detachable attachment mechanism. For example, the periphery of a first outer layer 201 of the covering 200, the periphery of a second outer layer 202 of the covering 200, and a top edge of the extension belt 104 of the inflatable body 100 are welded together by high-

frequency welding. It will be appreciated that other fixed attachment methods that joins these components may also be used.

[0063] Thus, in the second embodiment, the outer layers 201, 202 of the covering 200 is a weldable polymer material layer, and for example, is made of one or a combination of more of polyvinyl chloride (PVC), thermoplastic polyurethane elastomer (TPU), polyurethane (PU), polypropylene (PP), polyethylene (PE), polyethylene terephthalate (PET), nylon and other suitable polymer materials.

[0064] However, it will be appreciated that other materials may also be used in the case of other fixed attachment methods.

Third Embodiment

[0065] FIG. 8 and FIG. 9 show yet another structure of a covering 200 of an inflatable bed 10 according to a third embodiment of the present disclosure. It can be understood that an inflatable body 100 of the inflatable bed 10 in the third embodiment may be of an overall structure similar to that in the first embodiment or the second embodiment, and accordingly, can be understood with the help of the above detailed descriptions, and will not be repeated in detail this section. As in the second embodiment, the third embodiment may include any and/or all of the various arrangement and orientation options of the constituent parts of the inflatable bed 10 or the first and second embodiment, so long as such options do not conflict with the details of the third embodiment.

[0066] As shown in FIG. 8 and FIG. 9, in the inflatable bed 10 of the third embodiment, the covering 200 is a three-layer structure made by ultrasonic welding. More specifically, the covering 200 includes a first outer layer 201 oriented upwards and a second outer layer 202 oriented downwards. The periphery of the first outer layer 201 is connected to the periphery of the second outer layer 202, and an inner layer 203 is disposed between the first outer layer 201 and the second outer layer 202. A plurality of third weld lines 2012 are regularly distributed diagonally and are welded to the first outer layer 201 and the second outer layer 202 by ultrasonic welding, that is, by ultrasonic vibration. High temperature is locally generated in the materials to be processed to melt contact surfaces, and the contact surfaces are melted and joined under a certain pressure by way of a pressing die 400 (see FIG. 9). The distribution manner of the plurality of third weld lines 2012 is not restrictive and may be separately determined according to the appearance of the covering 200. The weld lines 2012 are distributed at various locations across the covering 200, similar to quilting, to join together the outer layers 201, 202 and the inner layer 203, disposed within, such that the inner layer 203 will remain relatively in place within the two outer layers 201, 202 and to avoid or limit bunching of the inner layer 203.

[0067] In the third embodiment, the first outer layer 201 and the second outer layer 202 of the covering 200 may be fabric layers, and for example, may be made of one or a combination of more of cotton fiber, wool fiber, silk fiber, hemp fiber, regenerated fiber, polyester fiber, polyamide fiber, polyacrylonitrile fiber, polyvinyl alcohol fiber, polypropylene fiber, polyurethane fiber, and/or inorganic fiber. Preferably, the fabric layers contain no less than 30% of chemical fibers to enhance the strength of connection. The inner layer 203 of the covering 200 is also a fabric layer and, for example, is made of one or a combination of more of cotton fiber, wool fiber, viscose fiber, acetate fiber, polyester fiber, polyamide fiber, polyacrylonitrile fiber, polyvinyl alcohol fiber, polypropylene fiber, and/or polyurethane fiber.

[0068] In addition, in the third embodiment, the first outer layer 201 and the second outer layer 202 of the covering 200 may also be polymer material layers, and for example, may be made of one or a combination of more of polyvinyl chloride (PVC), thermoplastic polyurethane elastomer (TPU), polyurethane (PU), polypropylene (PP), polyethylene (PE), polyethylene terephthalate (PET), nylon and other suitable polymer materials.

[0069] In the case that both the first outer layer 201 and the second outer layer 202 are fabric layers, the periphery of the first outer layer 201 and/or the periphery of the second outer layer 202 may be sewn with a detachable connecting mechanism 300 (such as that shown in FIGS. 1-4 and 8) such as a zipper, a reclosable fastener, or a snap fastener, for example, to be detachably connected to the extension belt 104 of the inflatable body 100. In the illustrated embodiment, a second half zipper 302 is sewn to the periphery of the first outer layer 201 and/or the periphery of the second outer layer 202 to be detachably connected to a first half zipper (as shown in FIGS. 1-4) on the extension belt 104 of the inflatable body 100.

[0070] In the case that the first outer layer 201 and the second outer layer 202 are polymer material layers, the periphery of the first outer layer 201 and/or the periphery of the second outer layer 202 may be detachably connected to the extension belt 104 of the inflatable body 100 by sewing the above-described detachable connecting mechanism 300, or may be fixedly connected to the extension belt 104 of the inflatable body 100, for example, by high-frequency welding, similar to the second embodiment. Other suitable fixed attachment methods may also be used.

[0071] Of course, when the layers 201, 202 are fabric layers, they may also be fixedly connected to the extension belt 104 in any suitable manner.

[0072] It is to be understood that the ultrasonic welding process may be used to weld polymer materials or fiber fabrics. Compared with the undesirable situations such as cracks, broken stitches, and skipping stitches, that may occur in the covering 200 manufactured by the quilting process, the covering 200 manufactured using the ultrasonic welding process according to the third embodiment is able to avoid these undesirable situations while improving the production efficiency, optimizing the

appearance and comfort of the product, and enriching the diversity of the product. However, it will be appreciated that the various aspects of the present disclosure may still provide the apparent improvements when quilting is used for the covering 200, as in FIGS. 1-7.

Fourth Embodiment

[0073] FIG. 10 shows a structure of a covering 200 of an inflatable bed 10 according to a fourth embodiment of the present disclosure. It can be understood that an inflatable body 100 of the inflatable bed 10 in the fourth embodiment may be of an overall structure similar to that in the above described embodiments, and accordingly, can be understood with the help of the above detailed descriptions, and will not be repeated in this section.

[0074] As shown in FIG. 10, the main difference between the inflatable bed 10 in the fourth embodiment and the inflatable bed 10 in the third embodiment is that the covering 200 is a two-layer structure made by ultrasonic welding, rather than the three layer structure of the third embodiment. More specifically, the covering 200 includes a single outer layer oriented upwards (i.e., a first outer layer 201 instead of first and second layers 201, 202 as in the third embodiment), and an inner layer 203 is connected to a bottom surface of the single outer layer 201 by ultrasonic welding along the third weld lines 2012. The bottom of the inner layer 203 in this embodiment is not covered by another outer layer. The distribution manner of the third weld lines 2012, similar to those of the third embodiment, is not restrictive, and may be the same or different as in the third embodiment, and may also be separately determined according to the appearance of the covering 200, such as having a different pattern or arrangement across the covering 200.

[0075] In the fourth embodiment, the outer layer 201 of the covering 200 is a polymer material layer, and for example, is made of one or a combination of more of polyvinyl chloride (PVC), thermoplastic polyurethane elastomer (TPU), polyurethane (PU), polypropylene (PP), polyethylene (PE), polyethylene terephthalate (PET), nylon and other suitable polymer materials; and the periphery of the outer layer 201 may be fixedly connected to the extension belt 104 of the inflatable body 100, for example, by high-frequency welding, so that the covering 200 cannot be detached from the inflatable body 100. In addition, the inner layer 203 of the covering 200 is a fabric layer, and for example, is made of one or a combination of more of cotton fiber, wool fiber, viscose fiber, acetate fiber, polyester fiber, polyamide fiber, polyacrylonitrile fiber, polyvinyl alcohol fiber, polypropylene fiber, or polyurethane fiber.

[0076] However, it will be appreciated that the covering 200 of the fourth embodiment may also be attached to the inflatable body 100 via a detachable connection 300 similar to those described above, such as a zipper, snaps, or the like. Unlike the three layer covering 200, the two layer covering 200 of the fourth embodiment would not be used as a reversible covering to provide the same type of material on the upper/outer surface when installed regardless of orientation, because the inner layer 203 maybe different than the single outer layer 201. However, the single outer layer 201 and inner layer 203 in this embodiment may be reversibly used in this arrangement to provide a user with a choice of the type of the material that will be directed upwardly and outwardly.

Fifth Embodiment

[0077] Additionally, in a fifth embodiment and applicable for use with any of the above embodiments and as illustrated in FIG. 11, the covering 200 and the inflatable body 100 may be connected in other ways. For example, the inflatable bed 10 may include a connecting strip 500 extending around the perimeter of the covering 200, the connecting strip 500 having an inner periphery 502 and an outer periphery 501, where the outer periphery 501 of the connecting strip 500 is fixedly connected to the extension belt 104, and the inner periphery 502 of the connecting strip 500 is detachably connected to the covering 200 having the detachable mechanism 300. For example, the inner periphery 502 may include zipper portion 301, and the cover 200 may include zipper portion 302, similar to the arrangement described in the first embodiment. The connecting strip 500 has a width of roughly 2 to 3 cm, and may be disposed above the top sheet 101 and parallel to the top sheet 101.

[0078] As shown in FIG. 11, the connecting strip 500 extends inwardly from the extension belt 104 along the contour of the upper surface of the inflatable bed 10 that is formed by the internal tension members, such that the connecting strip slopes downward along the upper surface. However, it will be appreciated that when the covering 200 is connected to the connecting strip 500, the connecting strip 500 may be pulled more taught in some arrangements.

[0079] The connecting strip 500 may accordingly extend inwardly from the outer edge of the top sheet 101 and the extension belt 104 and overlap an outer portion of the top sheet 101. Thus, the overall coverage area or footprint of the covering 200 in this approach is generally smaller than the overall coverage area of the top sheet 101 and thus the covering does not completely cover the top sheet 101. The area that is not covered by the covering 200 is covered by the connecting strip 500.

[0080] As shown in FIG. 11, the covering is illustrated similar to the covering 200 of the embodiment of FIG. 8, but is smaller due to the reduced coverage area. It will be appreciated that the covering may also be similar to those of the other embodiments (such as those with quilting as illustrated in FIGS. 1-7). It will further be appreciated that the connecting strip 500 may be used with the other embodiments, with the modification of such embodiments being primarily directed to the difference in the size of the covering 200 to accommodate the size of the connecting strip 500 that overlaps the top sheet 101. In

another aspect, the connecting strip 500 may be fixedly attached to the covering 200 in a manner as described herein, for instance via welding.

[0081] With reference now to all of the above embodiments and their variants and possible combinations of features, as can be seen from each of the above embodiments, compared with the prior inflatable beds, the inflatable bed 10 with a covering 200 according to the present disclosure has the advantages that the overall structure of the covering 200 is simple, and the covering 200 is convenient to manufacture and low in cost; moreover, the outer layer 201, 202 of the covering 200 can be conveniently connected to the inflatable body 100 of the inflatable bed 10 in a fixed or detachable manner, so that the covering 200 will not slip during use and meets the need for good comfort.

[0082] As can be understood from the present disclosure, each of the various features shown, described, or otherwise disclosed and apparent from the present disclosure may be interchangeably used with each of the embodiments so long as such features do not conflict.

[0083] The components and features described herein can be made of various other materials including, but not limited to, polymer, rubber, metal, and other suitable materials well known to those skilled in the art or a combination thereof. The described and illustrated embodiments only show the optional shapes, dimensions and arrangements of various components of the inflatable bed according to the present disclosure, which are merely illustrative but not limiting, and other shapes, dimensions and arrangements may be employed without departing from the scope of the present disclosure. Those skilled in the art can easily make modifications, variants, and equivalents of these embodiments on the basis of the disclosed content. For example, the illustrated or described features as part of an embodiment can be used with another embodiment to provide a further embodiment. The present disclosure is intended to cover these modifications, variants, and equivalents.

Claims

1. An inflatable bed comprising:

an inflatable body (100) comprising:

a top sheet (101);
a bottom sheet (102); and
a lateral confining sheet (103) connected to the top sheet (101) and the bottom sheet (102); and

a covering (200) connected to the inflatable body (100) and disposed over the top sheet (101), the covering (200) comprising:

at least one outer layer (201, 202), and

an inner layer (203) connected to the outer layer (201, 202),

wherein a periphery of the at least one outer layer (201, 202) is fixedly or detachably connected to the inflatable body (100), and the periphery of the at least one outer layer (201, 202) extends to a periphery of the top sheet (101).

2. The inflatable bed according to claim 1, wherein the at least one outer layer (201, 202) of the covering (200) includes a first outer layer (201) and a second outer layer (202), the periphery of the first outer layer (201) is connected to the periphery of the second outer layer (202), and the inner layer (203) is disposed between the first outer layer (201) and the second outer layer (202).

3. The inflatable bed according to claim 1, wherein the at least one outer layer (201, 202) of the covering (200) includes only a single outer layer (201, 202), and the inner layer (203) is connected to a bottom surface of the single outer layer (201, 202).

4. The inflatable bed according to claim 1, wherein the at least one outer layer (201, 202) is connected to the inner layer (203) by ultrasonic welding or quilting.

5. The inflatable bed according to claim 1, wherein the periphery of the at least one outer layer (201, 202) is fixedly connected to the inflatable body (100) by welding or is detachably connected to the inflatable body (100) via a zipper, a reclosable fastener, or a snap fastener.

6. The inflatable bed according to claim 1,

wherein the periphery of the top sheet (101) is connected to a top edge of the lateral confining sheet (103), the periphery of the bottom sheet (102) is connected to a bottom edge of the lateral confining sheet (103), and
wherein the inflatable body (100) further comprises an extension belt (104) extending upwardly from the top edge of the lateral confining sheet (103), and
wherein the periphery of the at least one outer layer (201, 202) is connected to the extension belt (104).

7. The inflatable bed according to claim 6, wherein the extension belt (104) and the lateral confining sheet (103) are made from the same sheet of material.

8. The inflatable bed according to claim 6, wherein the extension belt (104) is made from a separate sheet of material and is connected to the lateral confining

sheet (103) by welding.

9. The inflatable bed according to claim 1, wherein the inflatable body (100) further comprises a plurality of first tensioning members (105) disposed within the inflatable body (100) and that connect the top sheet (101) to the bottom sheet (102).

10. The inflatable bed according to claim 9, wherein the inflatable body (100) further comprises a plurality of second tensioning members (106), and each of the plurality of second tensioning members (106) connects either the top sheet (101) to the lateral confining sheet (103) or connects the bottom sheet (102) to the lateral confining sheet (103).

11. The inflatable bed according to claim 2, wherein the inner layer (203) fills a space defined between the first outer layer (201) and the second outer layer (202).

12. The inflatable bed according to claim 2, wherein the covering (200) includes a detachable mechanism (300) configured to detachably connect the periphery of the covering (200) to the periphery of the top sheet (101), wherein the covering (200) is reversible such that first outer layer (201) is outwardly exposed when the covering (200) is connected in a first state and the second outer layer (202) is outwardly exposed when the covering (200) is connected in a second state, wherein the second state is reversed relative to the first state.

13. The inflatable bed according to claim 3, wherein the covering (200) is fixedly connected to the inflatable body (100), and the inner layer (203) is disposed between the single outer layer (201) and the top sheet (101), wherein the inner layer (203) is adjacent the top sheet (101).

14. The inflatable bed of claim 6, further comprising a connecting strip (500) extending around the periphery of the top sheet (101) and having an outer periphery connected to the extension belt (104) and an inner periphery connected to the covering (200), wherein the connecting strip (500) overlaps the top sheet (101) along an outer peripheral area of the top sheet (101), wherein the covering (200) has a surface area that is smaller than a surface area of the top sheet (101), where a surface area of the connecting strip (500) and the surface area of the covering (200) combine to overlap and cover the entire surface area of the top sheet (101).

15. The inflatable bed of claim 14, wherein the outer periphery of the connecting strip (500) is fixedly attached to the extension belt (104) and the inner periphery of the connecting strip (500) is detachably connected to the covering (200)

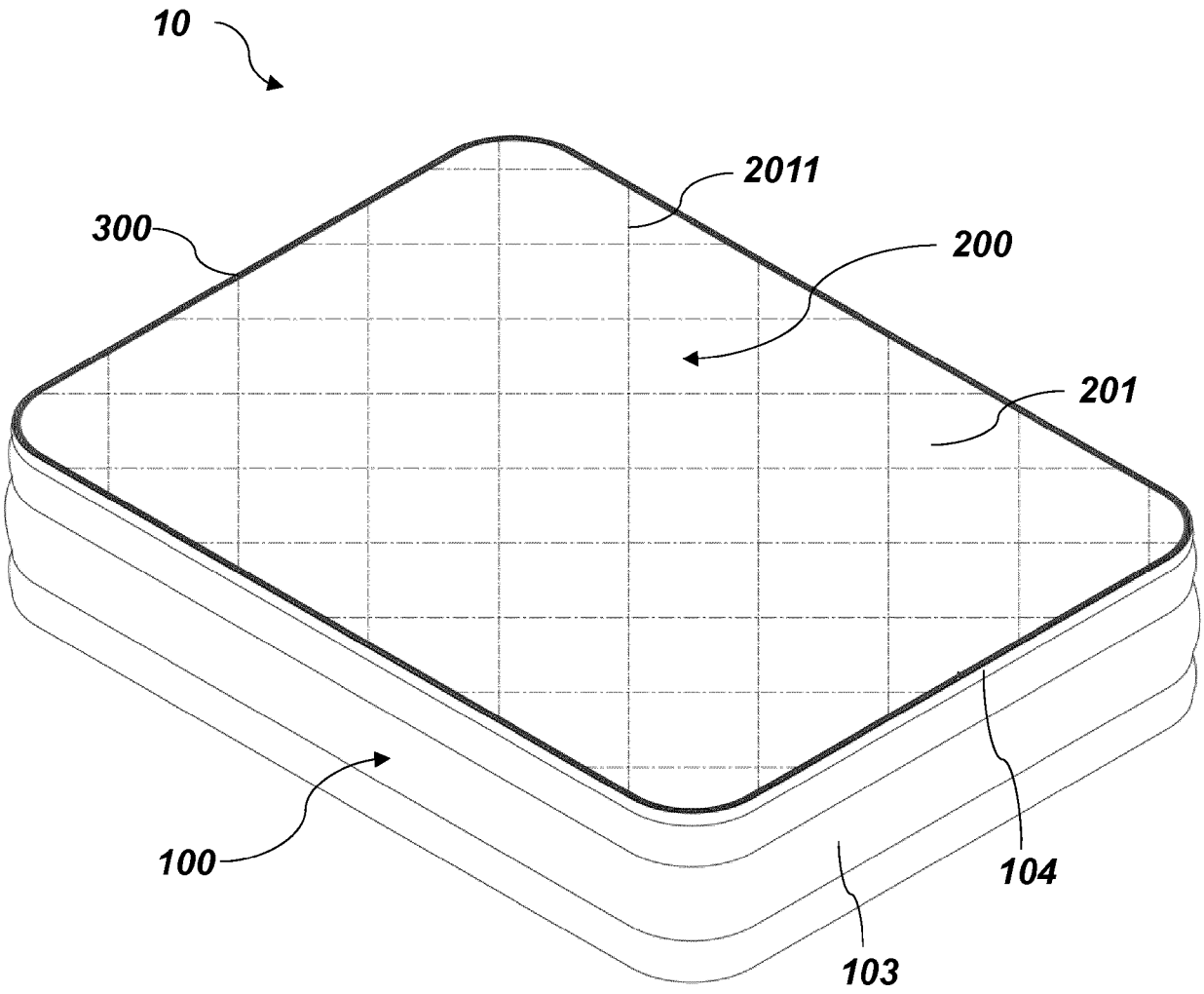

Fig. 1

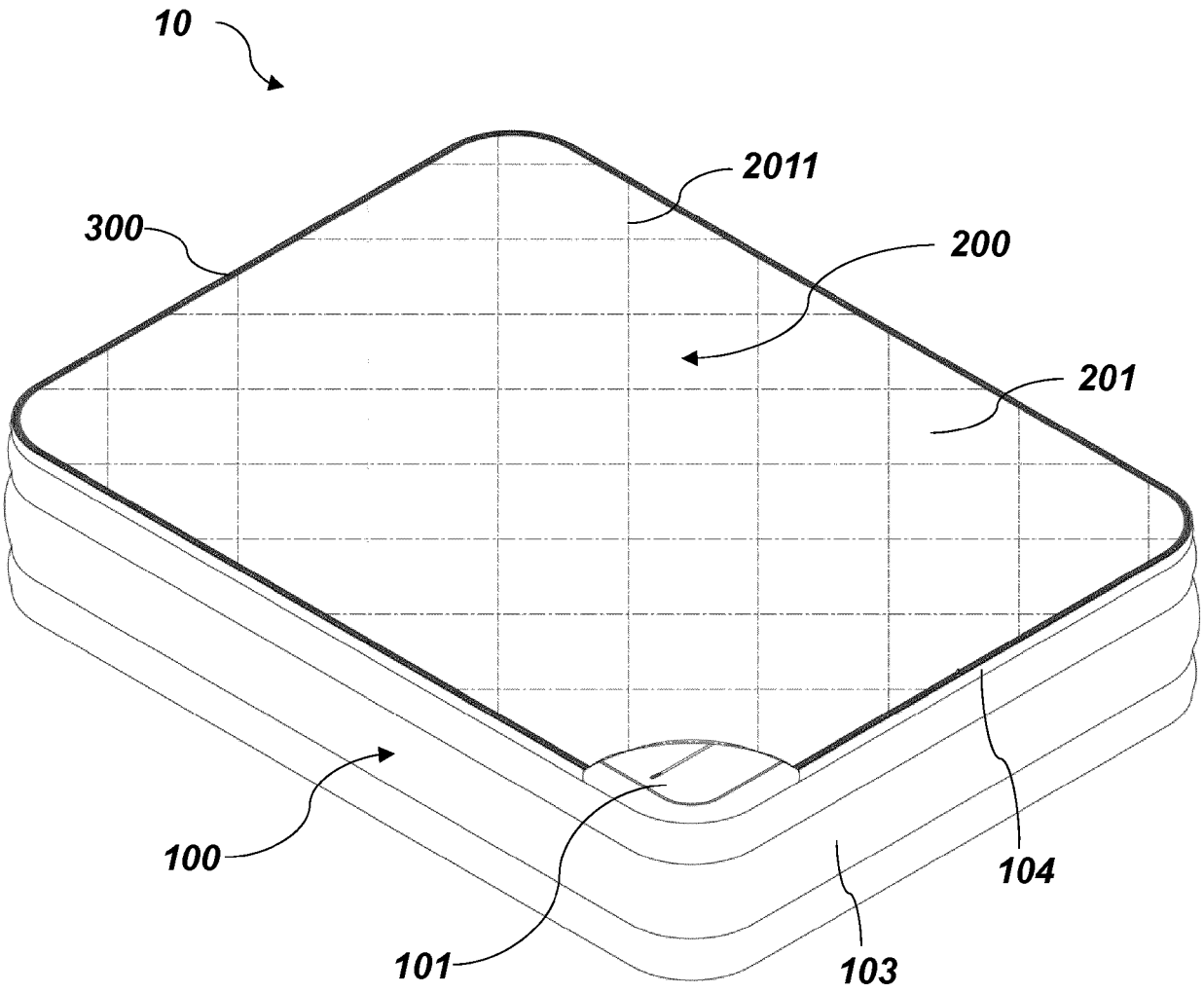

Fig. 2

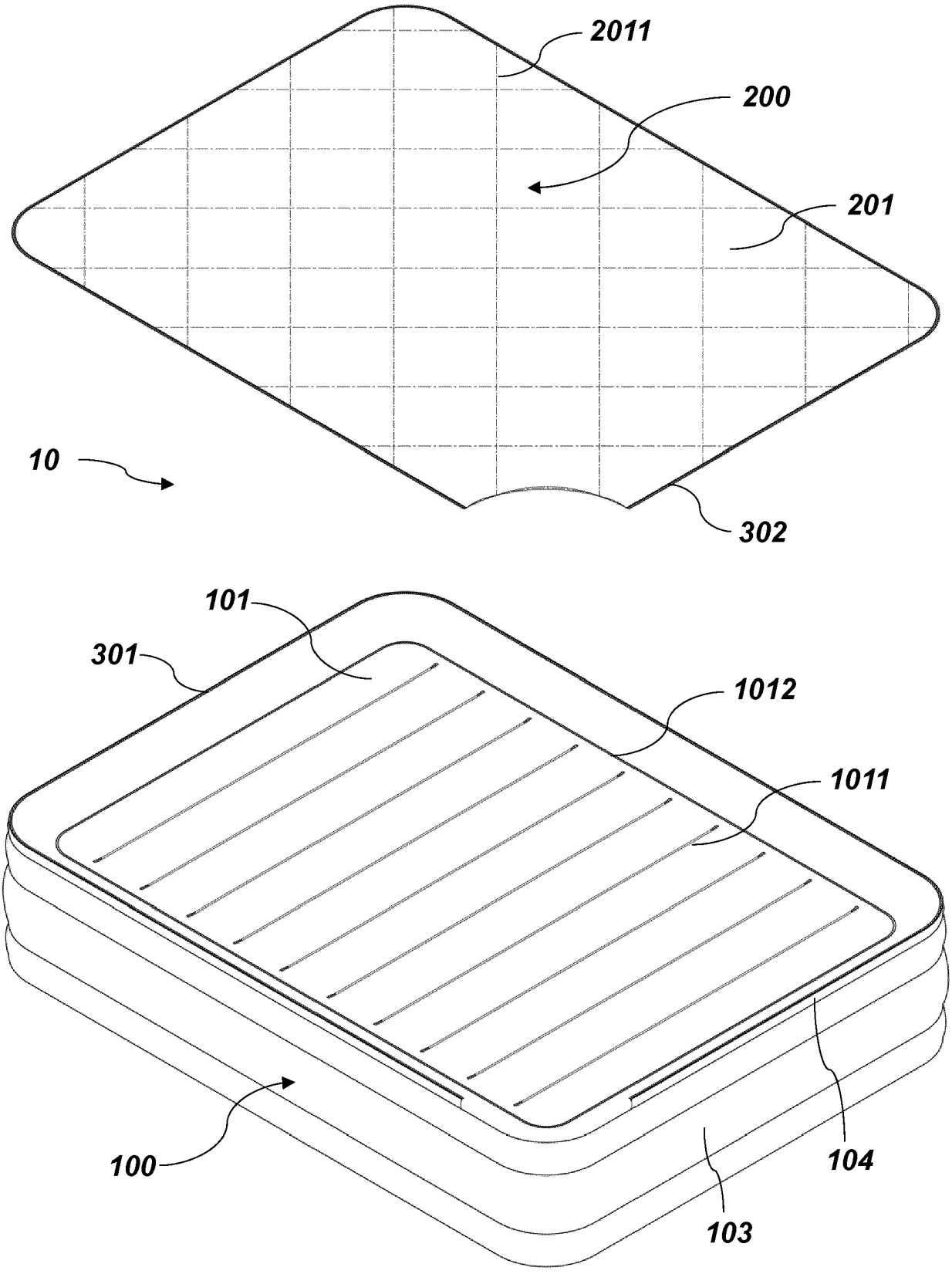

Fig. 3

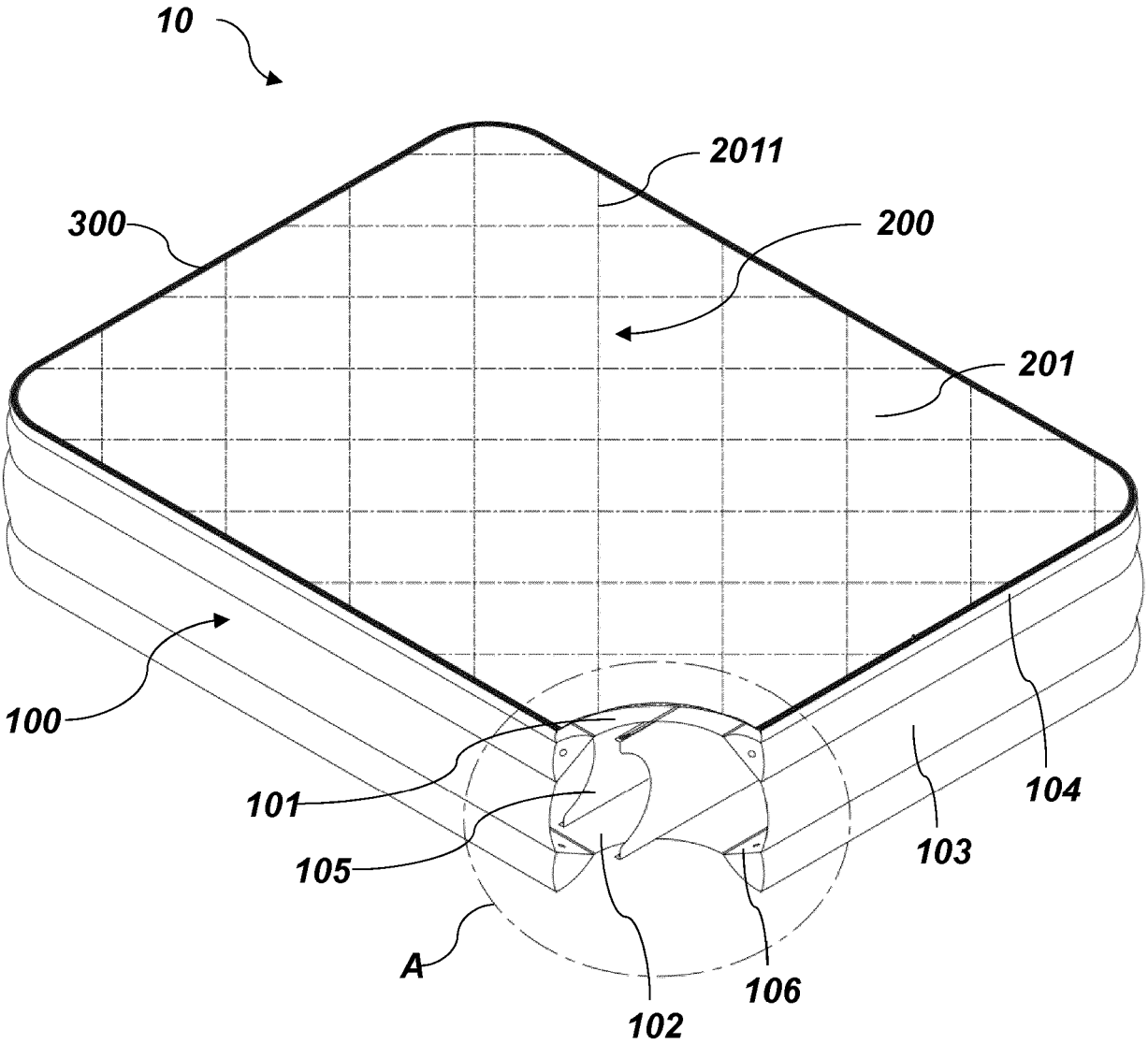

Fig. 4

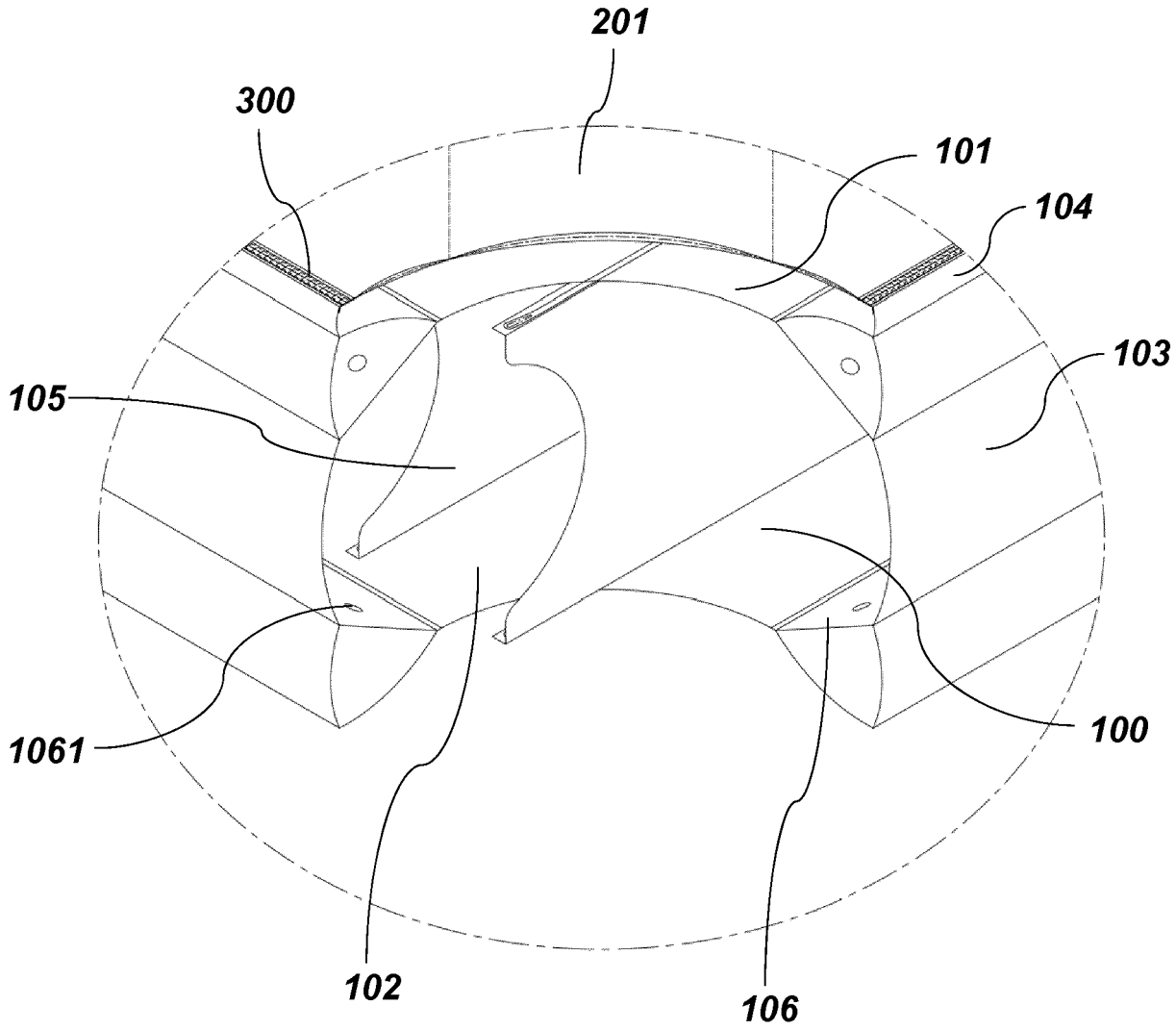

Fig. 5

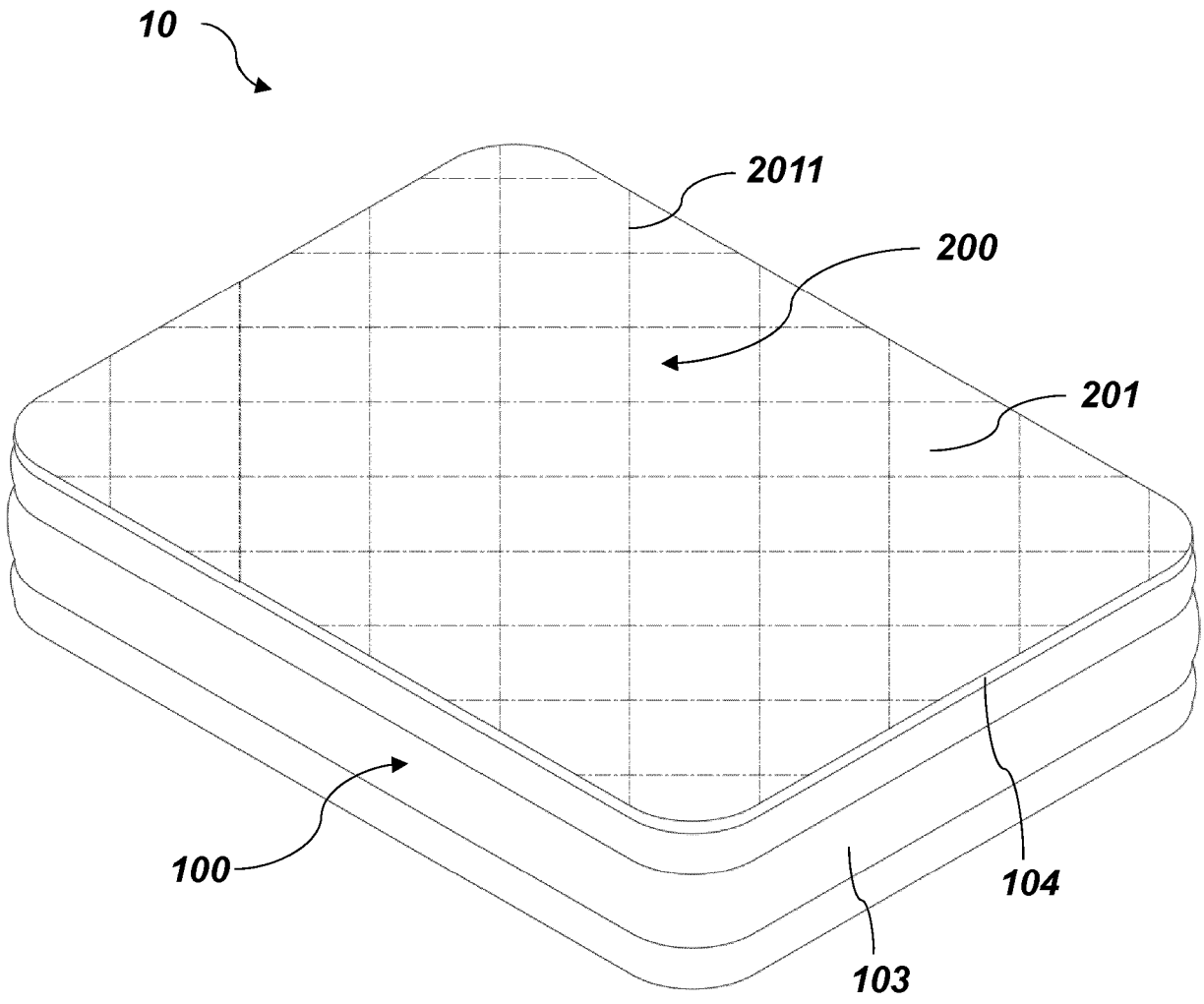

Fig. 6

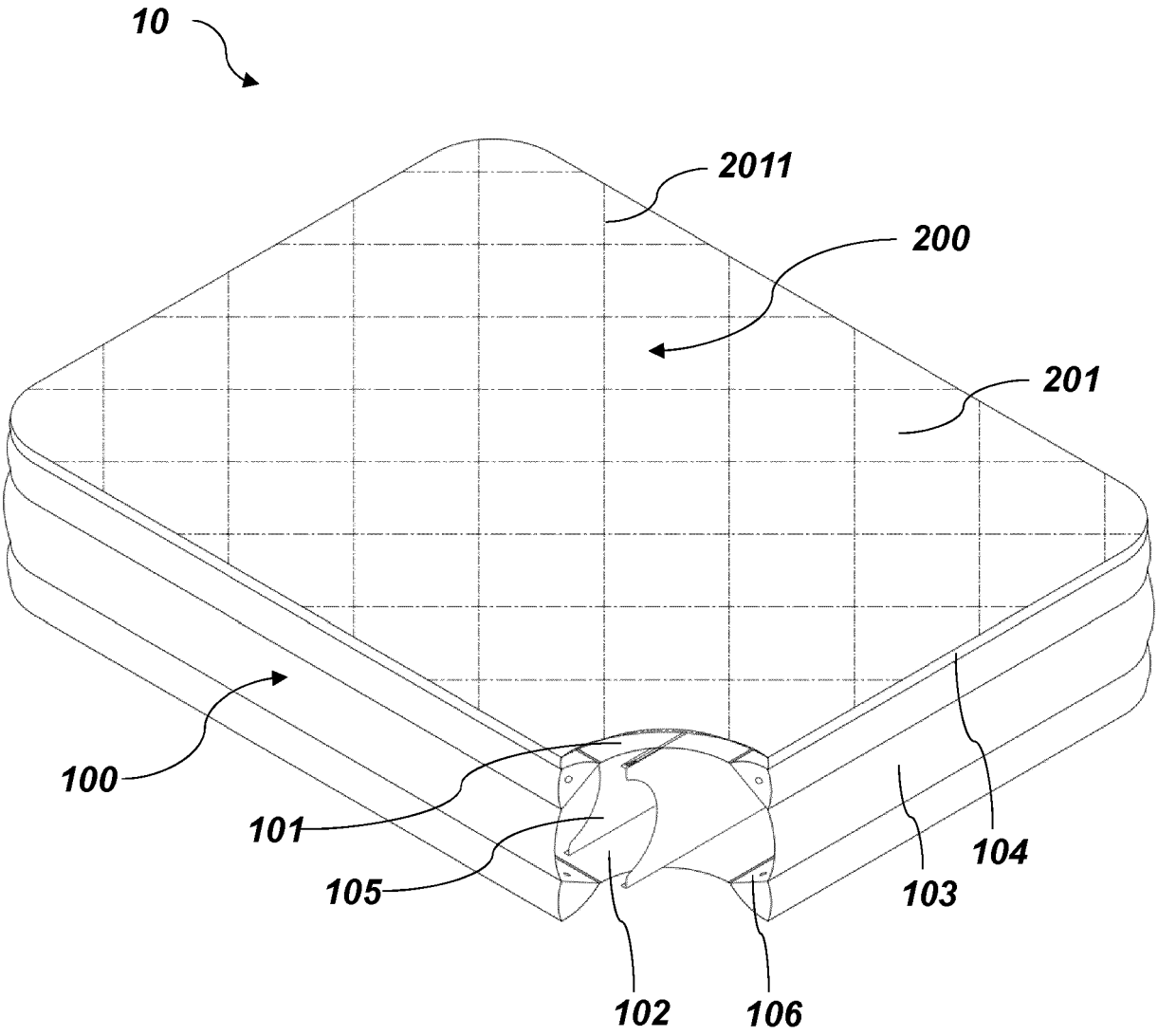

Fig. 7

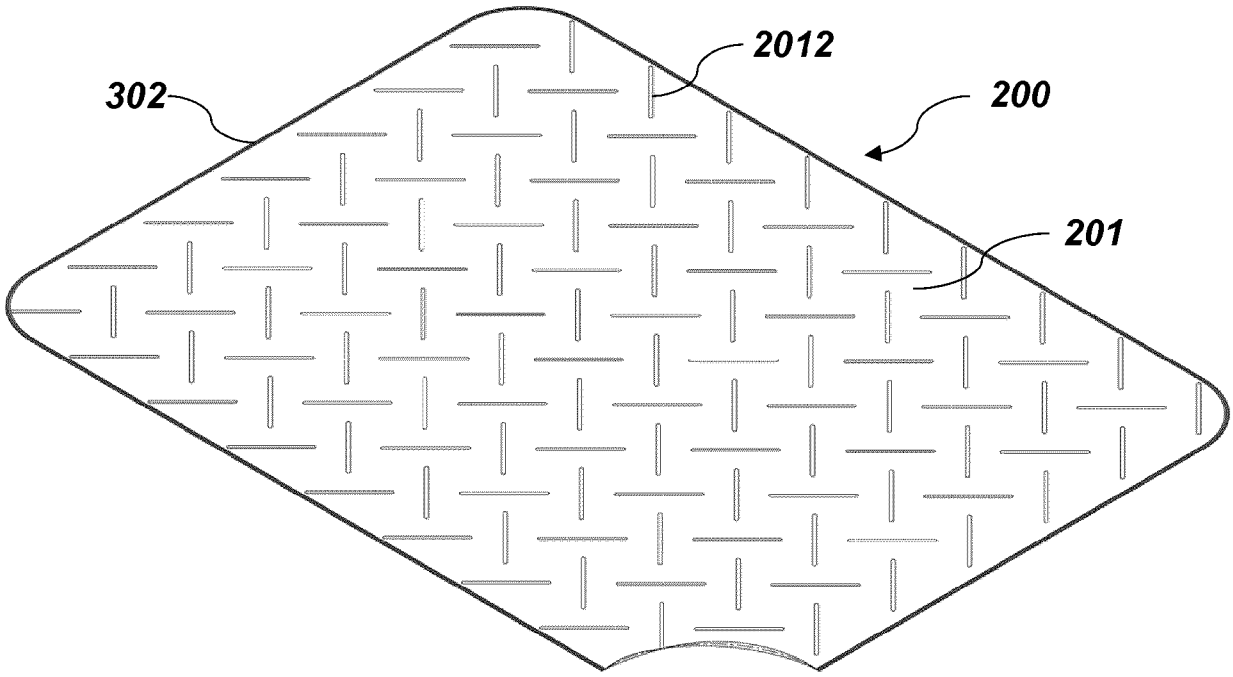

Fig. 8

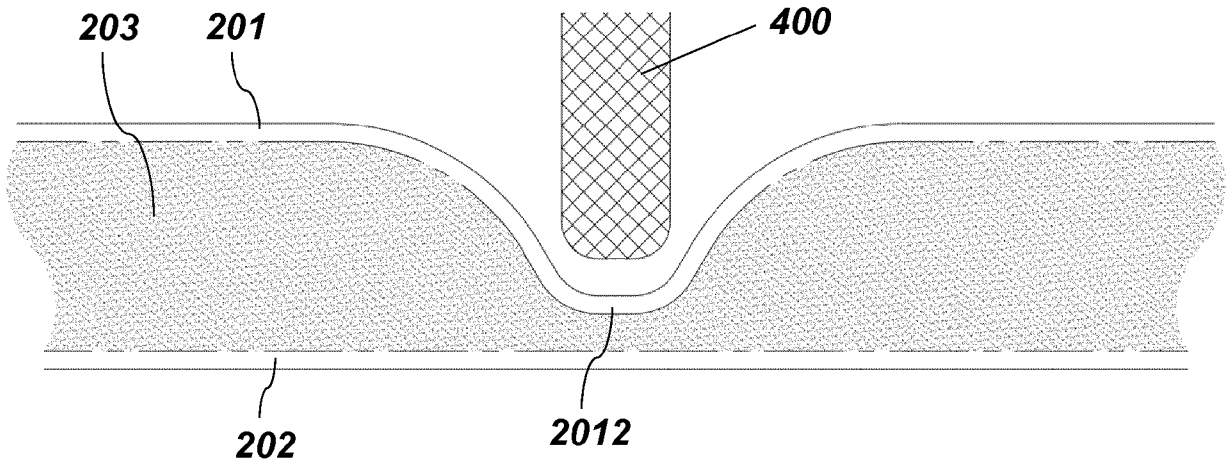

Fig. 9

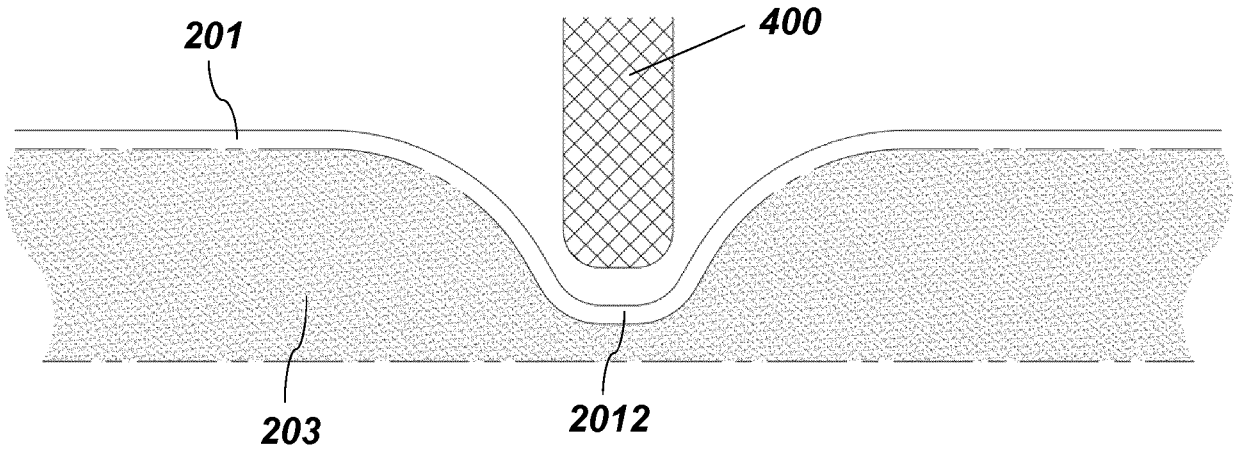

Fig. 10

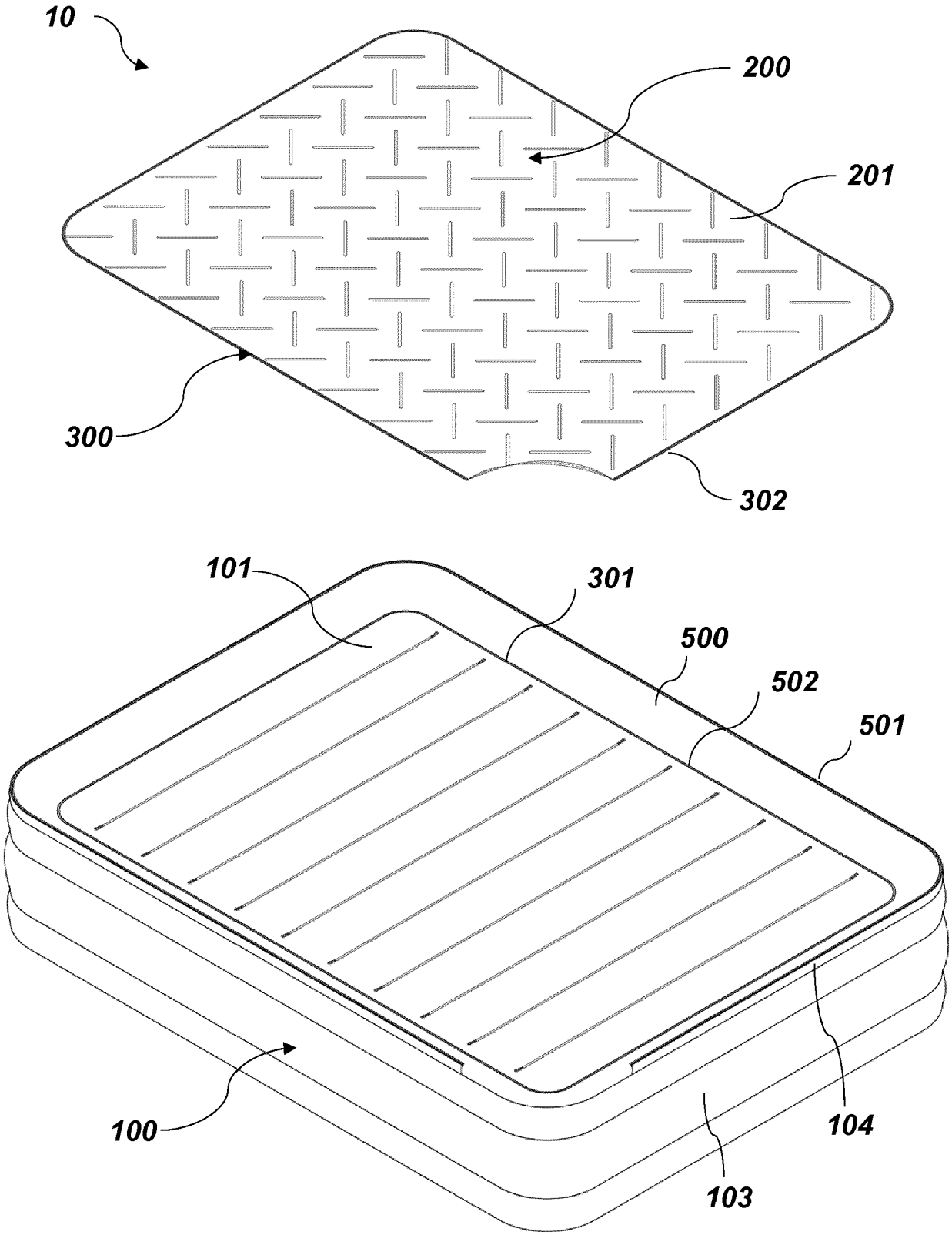

Fig. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 24 20 6262

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2005/022307 A1 (MCCLINTOCK JASON [US] ET AL) 3 February 2005 (2005-02-03) * figures 1-2 *	1-5, 11-13	INV. A47C27/08 A47C31/10
X	US 4 424 600 A (CALLAWAY MILTON A [US]) 10 January 1984 (1984-01-10) * figures 1-2 *	1,6-10	
X	CN 218 651 120 U (WUZHOU BAOFENG PLASTIC PRODUCTS CO LTD) 21 March 2023 (2023-03-21) * figures 1-3 *	1	
X	CN 215 604 433 U (MINGDA OPTOELECTRONIC XIAMEN CO LTD) 25 January 2022 (2022-01-25) * figures 4-5 *	1,14,15	

TECHNICAL FIELDS SEARCHED (IPC)

A47C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 February 2025	Melo Sousa, Filipe

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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21-02-2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005022307 A1	03-02-2005	NONE	
US 4424600 A	10-01-1984	NONE	
CN 218651120 U	21-03-2023	NONE	
CN 215604433 U	25-01-2022	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82