(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 570 131 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.06.2025 Bulletin 2025/25

(21) Application number: **24220234.9**

(22) Date of filing: **16.12.2024**

(51) International Patent Classification (IPC):
A47C 23/00 *(2006.01)* ***A47C 27/045*** *(2006.01)*
A47C 27/06 *(2006.01)* ***A47C 27/07*** *(2006.01)*
A47C 27/05 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A47C 23/002; A47C 23/005; A47C 27/045; A47C 27/0453; A47C 27/056; A47C 27/064; A47C 27/07

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **14.12.2023 CN 202311720556**
08.04.2024 CN 202410413874

(71) Applicant: **New-Tec Integration (Xiamen) Co., Ltd.**
Xiamen, Fujian 361100 (CN)

(72) Inventor: **LENG, Luhao**
Xiamen, 361100 (CN)

(74) Representative: **Verscht, Thomas Kurt Albert**
Josephsburgstrasse 88 A
81673 München (DE)

(54) **ELASTIC MATTRESS HAVING OPEN-STYLE ELASTIC LAYER**

(57) An elastic mattress having an open-style elastic layer, the elastic mattress comprises the elastic layer and one or more mattress layers; the elastic layer comprises a plurality of pre-compressed springs arranged in an array, a plurality of connecting seats are disposed on an outer periphery of the elastic layer, the one or more mattress layers are laid on an upper side of the elastic layer, multiple of insertion members or hanging members extend from around the one or more mattress layers, the elastic layer is fixed to the one or more mattress layers by plugging or hanging the insertion members or the hanging members on the connecting seats; and at least part of one or more side surfaces of the elastic layer are not wrapped by the insertion members or the hanging members. The one or more mattress layers are directly fixed to the elastic layer by plugging or hanging the insertion members or the hanging members on the connecting seats, a structure is simple, and an assembly and a disassembly are easy; and the one or more mattress layers directly expose the pre-compressed springs rather than closing side surfaces of the elastic layer to have a better air permeability compared to the one or more mattress layers and the elastic layer that are closed in the conventional elastic mattress.

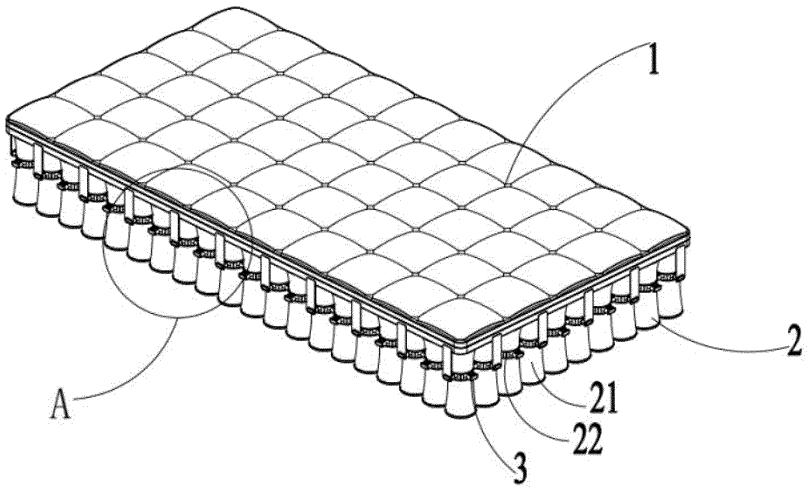

FIG. 1

EP 4 570 131 A1

Description

RELATED APPLICATIONS

[0001] This application claims priority to Chinese patent application number 202311720556.3, filed on December 14, 2023 and Chinese patent application number 202410413874.3, filed on April 8, 2024. Chinese patent application number 202311720556.3 and Chinese patent application number 202410413874.3 are incorporated herein by reference.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates to the technical field of elastic mattresses, and in particular relates to an elastic mattress having an open-style elastic layer.

BACKGROUND OF THE DISCLOSURE

[0003] Requirements of residents for household goods vary day by day with as material standard of human livings gradual improves. Especially, with respect to products, such as bed mattresses and sofa mattresses, on which users need to sit and lie down for a long time, requirements of the users not only increases, but the requirements also tend to diversify.

[0004] It should be known that the bed mattresses are obviously divided into high-quality bed mattresses and low-quality bed mattresses in a current market of home products. The low-quality bed mattresses usually have a thin thickness and are easy to transport and store, but cannot meet comfort requirements of the users by a certain extent. The high-quality bed mattresses usually have complex internal structures, have an exquisite workmanship, and have a large thickness, users will feel a superior comfort thereof when sitting and lying down, however, the high-quality bed mattresses cannot be dissembled due to the complex internal structures thereof, the bed mattresses purchased by the users are integrated and cannot be dissembled, and the users are inconvenienced when the bed mattresses are transported and stored; further, when some parts of the high-quality bed mattresses age, the user can only discard an entire body instead of performing targeted maintenance, resulting in waste to a certain extent. With respect to this problem, some of the elastic mattresses that are detachable between different mattress layers have appeared on the market, such as Chinese patent publication number CN115191779A of the applicant, a removable outer cover is provided, and an elastic layer and one or more mattress layers that are replaceable are stacked in the outer cover, which resolves the problem that parts of the elastic mattresses or the bed mattresses are not replaceable by a certain extent, however, the problem of insufficiently convenient disassembly of the bed mattresses as well as the problem of poorer air permeability of the mattresses still remain.

BRIEF SUMMARY OF THE DISCLOSURE

[0005] An objective of the technical problem is to provide an elastic mattress having an open-style elastic layer and an application thereof to address deficiencies of the existing techniques.

[0006] The technical solution of the present disclosure is as follows.

An elastic mattress having an open-style elastic layer, it comprises the elastic layer and one or more mattress layers;

Wherein the elastic layer comprises a plurality of pre-compressed springs arranged in an array, a plurality of connecting seats are disposed on an outer periphery of the elastic layer, the one or more mattress layers are laid on an upper side of the elastic layer, multiple of insertion members or hanging members extend from around the one or more mattress layers, the elastic layer is fixed to the one or more mattress layers by plugging or hanging the insertion members or the hanging members on the connecting seats; and

At least part of one or more side surfaces of the elastic layer are not wrapped by the insertion members or the hanging members.

[0007] In some possible embodiments, the connecting seats are disposed on one or more side surfaces of the pre-compressed springs.

[0008] In some possible embodiments, a plurality of connecting structures are disposed around peripheries of the connecting seats, and two of the connecting structures are connected to each other or the two of the connecting structures are connected by a third member; and

Each of the pre-compressed springs is disposed with one or more of the connecting seats, and two adjacent pre-compressed springs are connected by the connecting structures.

[0009] In some possible embodiments, the elastic layer further comprises a base plate, the base plate abuts ends of the pre-compressed springs away from the one or more mattress layers, and the connecting seats are disposed on the base plate.

[0010] In some possible embodiments, the base plate is formed by twisting a hard thread, the hard thread protrudes outwardly to form the connecting seats on an outer periphery of the base plate, and the hanging members are hung on the connecting seats.

[0011] In some possible embodiments, the base plate comprises a plurality of positioning posts protruding upward, and bottoms of at least some of the pre-compressed springs are connected to the positioning posts by plugging.

[0012] In some possible embodiments, a surrounding edge is disposed around a periphery of the one or more mattress layers, and the surrounding edge is parallel to

an elastic direction of the pre-compressed springs and wraps an upper end of a side surface of the elastic layer; and

The surrounding edge extends downward to define the insertion members or the hanging members, or the insertion members or the hanging members are fixed to the surrounding edge.

[0013] In some possible embodiments, middle portions of two adjacent pre-compressed springs are connected.

[0014] In some possible embodiments, the elastic mattress comprises multiple of the one or more mattress layers with different hardness.

[0015] An application of the elastic mattress, it comprises applying the elastic mattress having the open-style elastic layer in a sofa, a bed mattress an upholstered stool, or a camping mat.

[0016] The present disclosure at least has the following advantages.

[0017] The one or more mattress layers are directly fixed to the elastic layer by plugging or hanging the insertion members or the hanging members on the connecting seats, a structure is simple, and an assembly and a disassembly are easy; and the one or more mattress layers directly expose the pre-compressed springs rather than closing side surfaces of the elastic layer to have a better air permeability compared to the one or more mattress layers and the elastic layer that are closed in the conventional elastic mattress.

[0018] In some possible embodiments, each of the pre-compressed springs is disposed with a connecting seat configured to be connected to each other by the connecting structures, the pre-compressed springs do not need to be connected by welding at two ends thereof, and two adjacent pre-compressed springs do not interfere with each other to provide better independence.

[0019] In other possible embodiments, the one or more mattress layers wrap one or more upper ends of the one or more side surfaces of the elastic layer to achieve a certain effect for positioning the pre-compressed springs by the surrounding edge disposed around the periphery of the one or more mattress layers.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

FIG. 1 shows a diagrammatic view of a structure of an elastic mattress in Embodiment 1;
FIG. 2 shows a diagrammatic view of a structure of a mattress layer in Embodiment 1;
FIG. 3 shows a diagrammatic view of an inverted structure of the mattress layer in Embodiment 1;
FIG. 4 shows a diagrammatic view of a structure of an insertion member in Embodiment 1;
FIG. 5 shows an enlarged view of part A in FIG. 1;
FIG. 6 shows a diagrammatic view of a structure of an elastic mattress in Embodiment 2;
FIG. 7 shows a diagrammatic view of a structure of a mattress layer in Embodiment 2;
FIG. 8 shows a diagrammatic view of an inverted structure of the mattress layer in Embodiment 2;
FIG. 9 shows a diagrammatic view of a structure of an insertion member in Embodiment 2;
FIG. 10 shows an enlarged view of part B in FIG. 6;
FIG. 11 shows a diagrammatic view of a structure of an elastic mattress in Embodiment 3;
FIG. 12 shows a diagrammatic view of a structure of a mattress layer in Embodiment 3;
FIG. 13 shows a diagrammatic view of an inverted structure of the mattress layer in Embodiment 3;
FIG. 14 shows an enlarged view of part C in FIG. 11;
FIG. 15 shows a diagrammatic view of a structure of a mattress layer in Embodiment 4;
FIG. 16 shows a diagrammatic view of an inverted structure of the mattress layer in Embodiment 4;
FIG. 17 shows an enlarged view of part D in FIG. 16;
FIG. 18 shows a diagrammatic view of a structure of an elastic mattress in Embodiment 4;
FIG. 19 shows an enlarged view of part E in FIG. 18;
FIG. 20 shows a diagrammatic view of a structure of a mattress layer in Embodiment 5;
FIG. 21 shows a diagrammatic view of an inverted structure of the mattress layer in Embodiment 5;
FIG. 22 shows an enlarged view of part F in FIG. 20;
FIG. 23 shows a diagrammatic view of a structure of an elastic mattress in Embodiment 5;
FIG. 24 shows an enlarged view of part G in FIG. 23;
FIG. 25 shows a diagrammatic view of a structure of an elastic mattress in Embodiment 6;
FIG. 26 shows an enlarged view of part H in FIG. 25;
FIG. 27 shows a diagrammatic view of a structure of an elastic mattress in Embodiment 7;
FIG. 28 shows a diagrammatic view of the elastic mattress and a mattress layer that are separated in Embodiment 7;
FIG. 29 shows an enlarged view of part I in FIG. 27;
FIG. 30 shows an enlarged view of part J in FIG. 28;
FIG. 31 shows a diagrammatic view of a structure of a hanging ring in Embodiment 7;
FIG. 32 shows a diagrammatic view of a structure of a waist ring in Embodiment 7;
FIGS. 33 and 34 show diagrammatic views of structures of a waist ring plug in Embodiment 7.

[0021] Reference numbers in drawings: 1-mattress layer, 11-insertion member, 111-socket, 1112-first positioning hole, 112-buckling arm, 113-releasing portion, 12-hanging member, 121-strap for hanging ring, 122-hanging ring, 1221-hole for positioning hanging ring, 1222-hole for hanging connecting seat, 13-surrounding edge, 2-elastic layer, 21-pre-compressed spring, 22-connecting seat, 23-base plate, 231-positioning post, 3-insertion sub-piece, 31-first protrusion, 41-T-shaped protrusion, 42-Y-shaped joint, 5-insertion groove, 61-bottom edge, 62-first side edge, 63-second side edge, 64-first insertion

portion, 641-second protrusion, 65-first receiving portion, 651-second positioning hole, 7-hanging hole, 81-waist ring, 82-waist ring plug, 821-positioning protrusion, 91-elliptical annular outer wall, 92-second insertion portion, 921-buckling tongue, 922-releasing member, 93-second receiving portion, 931-buckling groove.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0022] The technical solutions in the embodiments of the present disclosure will be described clearly and completely in combination with the accompanying drawings in the embodiments of the present disclosure; it is obvious that the described embodiments are merely a part of the embodiments of the present disclosure rather than all of the embodiments, and all other embodiments fall within the scope of protection of the present disclosure provided that they are obtained based on the embodiments of the present disclosure by a person of ordinary skill in the art without creative works.

[0023] In the description of the present disclosure, it should be noted that the terms, such as "upper", "lower", "inner", "outer", and "top/bottom", indicate orientations or positional relationships based on orientations or positional relationships shown in the accompanying drawings, which are merely used to easily describe the present disclosure and simplify the description of the present disclosure, rather than indicating or implying that a referred device or element should have a particular orientation or be constructed and operated with a particular orientation, and therefore should not to be understood as a limitation of the present disclosure. Furthermore, the terms "first" and "second" are merely used for descriptive purposes and should not be understood as indicating or implying relative importance.

[0024] In the description of the present disclosure, unless otherwise expressly specified and limited, it is noted that the terms, such as "mounted", "provided with", "socketed/sleeved", and "connected", should develop a broad understanding, for example, "connection" can be a wall-mountable connection, a detachable connection, a one-piece connection, a mechanical connection, an electrical connection, a direct connection, an indirect connection via an intermediate medium, or a communication between inner portions of two elements, and the specific meaning of the terms in the present disclosure can be understood in specific conditions for those of ordinary skill in the art.

[0025] A thickness, a compart pattern, and the like of one or more mattress layers shown in the accompanying drawings are not main technical features of the present disclosure and should not be understood as a limitation of the present disclosure.

[0026] In the following embodiment, an elastic mattress comprises an elastic layer and one or more mattress layers laid on the elastic layer. In other possible embodiments, other functional layers, such as an additional filling layer or a balancing mesh layer for limiting spring units of the elastic layer, can be disposed between the one or more mattress layers and the elastic layer, alternatively, the elastic mattress can comprise a plurality of mattress layers with same or different softness or hardness, as long as at least an uppermost layer of the one or more mattress layers can be removably connected to connecting seats of the elastic layer by insertion members or hanging members.

[0027] In the following embodiments, the elastic layer at least comprises a plurality of pre-compressed springs arranged in an array, in addition, in some embodiments, the elastic layer further comprises a base plate. When the elastic layer comprises the base plate, the base plate abuts the pre-compressed springs, and the connecting seats can be disposed on the base plate or the pre-compressed springs. Further, when the connecting seats are disposed on the pre-compressed springs, the connecting seats can also be disposed with connecting structures, at this time, in addition to securing the elastic layer with the one or more mattress layers, which is achieved by a connection between the connecting seats and the insertion members or the hanging members, two of the connecting seats can be connected to each other by the connecting structures.

Embodiment 1

[0028] FIG. 1 shows a diagrammatic view of an elastic mattress in this embodiment, it comprises an elastic layer 2 and one or more mattress layers 1 laid on an upper side of the elastic layer 2. The elastic layer 2 comprises a plurality of pre-compressed springs 21 arranged in an array and a plurality of connecting seats 22, the connecting seats 22 are sleeved at waists of the pre-compressed springs 21, and the connecting seats 22 comprise insertion sub-pieces 3.

[0029] FIGS. 2 and 3 illustrate specific structures of the one or more mattress layers, a plurality of insertion members 11 are disposed around a periphery of the one or more mattress layers 1, the insertion members 11 are insertion parent-pieces that cooperate with the insertion sub-pieces 3, and the insertion members 11 are positioned at and cooperate with the insertion sub-pieces 3 to achieve a connection between the pre-compressed springs 21 and the one or more mattress layers 1.

[0030] Specifically, as shown in FIGS. 4 and 5, the insertion sub-pieces 3 are disposed on the connecting seats 22 and protrude outward, first protrusions 31 as buckling structures are disposed on upper sides of the insertion sub-pieces 3, ends of the insertion members 11 are connected to main bodies of the one or more mattress layers 1, another ends form sockets 111 facing a direction toward inner portions of the one or more mattress layers 1, first positioning holes 1112 in which the first protrusions 31 are buckled are disposed on upper walls of the sockets 111, after the insertion sub-pieces 3 are inserted into the sockets 111, the first protrusions 31 are buckled into the first positioning holes 1112 to be positioned at and co-

operate with the first positioning holes 1112, so as to secure the one or more mattress layers 1 with the elastic layer 2.

Embodiment 2

[0031] As shown in FIGS. 6-10, an elastic mattress of this embodiment comprises an elastic layer 2 and one or more mattress layers 1 laid on an upper side of the elastic layer 2. The elastic layer 2 comprises a plurality of pre-compressed springs 21 arranged in an array and a plurality of connecting seats 22, and the connecting seats 22 are sleeved at waists of the pre-compressed springs 21.

[0032] In this embodiment, the connecting seats 22 comprise T-shaped protrusions 41, the one or more mattress layers 1 comprise an insertion member 11, an end of the insertion member 11 away from main bodies of the one or more mattress layers 1 also forms a T-shaped protrusion 41, and one of the T-shaped protrusions 41 on each of two adjacent pre-compressed springs 21 is connected to the T-shaped protrusion 41 on the insertion member 11 by a third member. The third member is a Y-shaped joint 42, the Y-shaped joint 42 comprises three interfaces, and T-shaped protrusions 41 on two of the connecting seats and the T-shaped protrusion on the insertion member 11 are respectively plugged to one interface of the Y-shaped joint 42.

Embodiment 3

[0033] As shown in FIGS. 11-14, an elastic mattress of this embodiment comprises an elastic layer 2 and one or more mattress layers 1 laid on an upper side of the elastic layer 2. The elastic layer 2 comprises a plurality of pre-compressed springs 21 arranged in an array and a plurality of connecting seats 22, and the connecting seats 22 are sleeved on waists of the pre-compressed springs 21.

[0034] A surrounding edge 13 that is irregular and has a wide top and a narrow bottom is formed by downwardly extending from around the one or more mattress layers 1, the surrounding edge 13 is parallel to an elastic direction of the pre-compressed springs 21 and encompasses an upper end of a side surface of the elastic layer 2, insertion members 11 are integrally formed on the surrounding edge 13, and the insertion members 11 are located at a lower end of the surrounding edge 13. The insertion members 11 are downward buckles protruding forward, the connecting seats 22 comprise insertion grooves 5 with openings facing upward, and the insertion members 11 can enter into the insertion grooves 5 to achieve a plug-in connection with the insertion grooves 5.

[0035] Further, a front end of an insertion member 11 comprises two buckling arms 112, and two sides of the insertion member 11 are releasing portions 113. Opposite elastic deformation of the buckling arms 112 can be driven by the releasing portions 113 to enable the two buckling arms 112 to be close to each other, so that the buckling arms 112 enter into or leave from an insertion groove 5.

Embodiment 4

[0036] In Embodiment 4, as shown in FIGS. 15-19, an elastic mattress comprises an elastic layer 2 and one or more mattress layers 1 laid on an upper side of the elastic layer 2. The elastic layer 2 comprises a pre-compressed spring 21, a connecting seat 22 and a base plate 23, the base plate 23 comprises a positioning post 231 protruding upward, and the pre-compressed spring 21 is sleeved to the positioning post 231 to enable the base plate 23 to abut and be positioned at the pre-compressed spring 21.

[0037] Specifically, as shown in FIG. 17, an insertion member 11 protrudes inward from one or more side edges of the one or more mattress layers 1, the insertion member 11 has a bottom edge 61, a first side edge 62 and a second side edge 63, the bottom edge 61, the first side edge 62 and the second side edge 63 roughly form a triangle. A middle part of the second side edge 63 away from the first side edge 62 protrudes outward to form a first insertion portion 64 shaped in a triangle, and the middle part of the second side edge 63 adjacent to the first side edge 62 protrudes inward to form a first receiving portion 65 for a cooperation with the first insertion portion 64. Further, a side of the first insertion portion 64 away from the first side edge 62 comprises a second protrusion 641 as a positioning structure, and a position of the first receiving portion 65 corresponding to the first side edge 62 comprises a second positioning hole 651 into which the second protrusion 641 is buckled.

[0038] Referring to FIGS. 18 and 19, front, rear, left, and right sides of the connecting seat 22 respectively have a connecting structure, and the connecting structure is the same as a structure of the insertion member 11. The first insertion portion 64 and the first receiving portion 65 of the insertion member 11 can respectively achieve a plug-in connection with a first receiving portion 65 and a first insertion portion 64 of the connecting structure on the connecting seat 22 to secure the one or more mattress layers and the elastic layer, and the first insertion portion 64 is positioned at the first receiving portion 65 by a cooperation of the second protrusion 641 and the second positioning hole 651.

Embodiment 5

[0039] In this embodiment, an elastic mattress comprises an elastic layer 2 and one or more mattress layers 1 laid on an upper side of the elastic layer 2. As shown in FIGS. 20-22, a surrounding edge 13 is disposed around one or more outer peripheries of the one or more mattress layers 1, a lower end of the surrounding edge 13 is connected to a hanging member 12, and the hanging member 12 is a hanging hook extending downward.

[0040] A structure of the elastic layer 2 is shown in FIGS. 23 and 24, the elastic layer 2 comprises a base plate 23 and a pre-compressed spring 21 disposed on the

base plate 23, a connecting seat 22 is formed at a bottom of the pre-compressed spring 21 at an outer periphery of the elastic layer 2, the connecting seat 22 is a lug sheet, and the lug sheet comprises a hanging hole 7. The hanging member 12 is hung on the hanging hole 7 to secure the one or more mattress layers 1 with the elastic layer 2.

Embodiment 6

[0041] A structure of one or more mattress layers 1 of Embodiment 6 is the same as that of Embodiment 5, as shown in FIGS. 20-22. Embodiment 6 differs from Embodiment 5 in that a structure of the elastic layer 2 is different, as shown in FIGS. 25 and 26, in this embodiment, the base plate 23 is formed by twisting a hard metal thread, the metal thread outwardly protrudes to form the hanging hole 7 on an outer periphery of the base plate 23, the connecting seat 22 of this embodiment is the hanging hole 7, the one or more mattress layers 1 comprise a hanging member 12, the hanging member 12 is a hanging hook extending downward, and the hanging member 12 is hung on the hanging hole 7 to secure the one or more mattress layers 1 with the elastic layer 2.

Embodiment 7

[0042] As shown in Figures 27 and 28, an elastic mattress comprises an elastic layer 2 and one or more mattress layers 1 laid on an upper side of the elastic layer 2, and a plurality of hanging members 12 are disposed around one or more outer peripheries of the one or more mattress layers 1. In this embodiment, the hanging members 12 comprise straps 121 for hanging rings and the hanging rings 122, the hanging rings 122 comprise holes 1221 for positioning the hanging rings and holes 1222 for hanging one or more connecting seats, as shown in FIGS. 29-31, ends of the straps 121 for the hanging rings away from one or more bodies of the one or more mattress layers 1 pass through the holes 1221 for positioning the hanging rings to enable the straps 121 for the hanging rings to be connected to the hanging rings 122; the one or more connecting seats 22 of the elastic layer 2 are hung on the holes 1222 for hanging the one or more connecting seats to secure the one or more mattress layers 1 with the elastic layer 2.

[0043] The elastic layer 2 comprises one or more pre-compressed springs 21 and the one or more connecting seats 22, the one or more connecting seats 22 comprise one or more waist rings 81 sleeved on the one or more pre-compressed springs 21 and one or more waist ring plugs 82 detachably disposed on the one or more waist rings 81. Front, rear, left and right sides of a waist ring 81 comprises four of connecting structures configured to be connected to each other, two of the one or more waist rings 81 can be connected to each other through the connecting structures, the one or more waist ring plugs 82 also comprises connecting structures to connect the one or more waist ring plugs 82 to the one or more waist rings 81.

[0044] As shown in Figs. 32 and 33, a connecting structure of this embodiment has an elliptical annular outer wall 91, a cavity is formed inside of the elliptical annular outer wall 91, a second insertion portion 92 having a roughly right-angled trapezoidal shape is formed by protruding outwardly from a bottom of the cavity, and the rest of the cavity forms a second receiving portion 93 configured to cooperatively define a plug-in connection with a second insertion portion 92 of another connecting structure. Further, a buckling tongue 921 configured to produce an elastic deformation in a direction perpendicular to an insertion direction and a releasing member 922 configured to be connected to the buckling tongue 921 to control the elastic deformation of the bucking tongue 921 are disposed on a side of the second insertion portion 92 away from the second receiving portion 93, and a buckling groove 931 configured to be buckled to the bucking tongue 921 is disposed on a corresponding position on an inner wall of the second receiving portion 93. When two of the connecting structures are close to each other, the bucking tongue 921 in the second insertion portion 92 is elastically deformed in a direction close to a middle portion of the cavity, so that the second insertion portion 92 enters into the second receiving portion 93 so as to be then locked by a cooperation of the buckling tongue 921 and the buckling groove 931. When a connection of the two of the connecting structures needs to be released, the releasing member 922 continues to be pressed, and the releasing member 922 controls the buckling tongue 921 to be elastically deformed in the direction close to the middle portion of the cavity and to leave the buckling groove 931, thereby releasing a cooperation locking of the buckling tongue 921 and the buckling groove 931.

[0045] Referring to FIGS. 33 and 34, the hanging members 12 are hung to the one or more waist ring plugs 82, in order to prevent a hanging member 12 from slipping off a waist ring plug 82, opposing positions of upper and lower bottom surfaces of the waist ring plug 82 comprise positioning protrusions 821, and a height of the waist ring plug 82 at a position of the two positioning protrusions 821 is greater a height of a hole 1222 for hanging a connecting seat. In addition, in order to reduce sliding of the hanging member 12 on the connecting seat 22, in this embodiment, a positioning protrusion 821 is further disposed on the lower bottom surface of the waist ring plug 82 adjacent to a waist ring 81, a height of the waist ring plug 82 at this position is equal to the height of the hole 1222 for hanging the connecting seat, therefore, when the hanging member 12 is hung on the connecting seat 22, a distance between the hole 1222 for hanging the connecting seat and the lower bottom surface of the waist ring plug 82 is less than a height of the positioning protrusion 821 by adjusting a length of a strap 121 for a hanging ring. In this embodiment, the strap 121 for the hanging ring is a plastic sheet, in other possible embodi-

ments, the strap 121 for the hanging ring can be made of leather or cloth, and in other possible embodiments, the strap 121 for the hanging ring can be an elastic strap to enable the hanging ring 122 to abut the waist ring plug 82.

[0046] In this embodiment, as the aforementioned three positioning protrusions 821 are disposed on the waist ring plug 82, when being assembled, the hanging ring 122 needs to be firstly hung on the waist ring plug 82 through the hole 1222 for hanging connecting seat, and the waist ring plug 82 is then buckled to the waist ring 81.

[0047] The present invention may be summarized as follows: An elastic mattress having an open-style elastic layer, the elastic mattress comprises the elastic layer and one or more mattress layers; the elastic layer comprises a plurality of pre-compressed springs arranged in an array, a plurality of connecting seats are disposed on an outer periphery of the elastic layer, the one or more mattress layers are laid on an upper side of the elastic layer, multiple of insertion members or hanging members extend from around the one or more mattress layers, the elastic layer is fixed to the one or more mattress layers by plugging or hanging the insertion members or the hanging members on the connecting seats; and at least part of one or more side surfaces of the elastic layer are not wrapped by the insertion members or the hanging members. The one or more mattress layers are directly fixed to the elastic layer by plugging or hanging the insertion members or the hanging members on the connecting seats, a structure is simple, and an assembly and a disassembly are easy; and the one or more mattress layers directly expose the pre-compressed springs rather than closing side surfaces of the elastic layer to have a better air permeability compared to the one or more mattress layers and the elastic layer that are closed in the conventional elastic mattress.

[0048] The aforementioned description is merely preferred embodiments of the present disclosure and the scope of the present disclosure should not be limited thereto, thus, equivalent variations and modifications fall within the scope of the present disclosure provided that they are made based on the content of the specification and the scope of the present disclosure.

Claims

1. An elastic mattress having an open-style elastic layer, **characterized in that**, it comprises the elastic layer and one or more mattress layers;

   wherein the elastic layer comprises a plurality of pre-compressed springs arranged in an array, a plurality of connecting seats are disposed on an outer periphery of the elastic layer, the one or more mattress layers are laid on an upper side of the elastic layer, multiple of insertion members or hanging members extend from around the one or more mattress layers, the elastic layer is fixed to the one or more mattress layers by plugging or hanging the insertion members or the hanging members on the connecting seats; and

   at least part of one or more side surfaces of the elastic layer are not wrapped by the insertion members or the hanging members.

2. The elastic mattress according to claim 1, **characterized in that**, the connecting seats are sleeved on the pre-compressed springs.

3. The elastic mattress according to claim 1 and/or 2, **characterized in that**, a plurality of connecting structures are disposed around peripheries of the connecting seats, and two of the connecting structures are connected to each other or the two of the connecting structures are connected by a third member; and

   each of the pre-compressed springs is disposed with one or more of the connecting seats, and two adjacent pre-compressed springs are connected by the connecting structures.

4. The elastic mattress according to any one or more of claims 1 to 3, **characterized in that**, the elastic layer further comprises a base plate, the base plate abuts ends of the pre-compressed springs away from the one or more mattress layers, and the connecting seats are disposed on the base plate.

5. The elastic mattress according to claim 4, **characterized in that**, the base plate is formed by twisting a hard thread, the hard thread protrudes outwardly to form the connecting seats on an outer periphery of the base plate, and the hanging members are hung on the connecting seats.

6. The elastic mattress according to claim 4 and/or 5, **characterized in that**, the base plate comprises a plurality of positioning posts protruding upward, and bottoms of at least some of the pre-compressed springs are connected to the positioning posts by plugging.

7. The elastic mattress according to any one or more of claims 1 to 6, **characterized in that**, a surrounding edge is disposed around a periphery of the one or more mattress layers, and the surrounding edge is parallel to an elastic direction of the pre-compressed springs and wraps an upper end of a side surface of the elastic layer; and

   the surrounding edge extends downward to define the insertion members or the hanging members, or the insertion members or the hanging members are fixed to the surrounding edge.

8. The elastic mattress according to any one or more of

claims 1 to 7, **characterized in that**, middle portions of two adjacent pre-compressed springs are connected.

9. The elastic mattress according to any one or more of claims 1 to 8, **characterized in that**, it comprises multiple of the one or more mattress layers with different hardness.

10. An application of the elastic mattress, **characterized in that**, applying the elastic mattress having the open-style elastic layer according to any one or more of claims 1-9 in a sofa, a bed mattress, an upholstered stool or a camping mat.

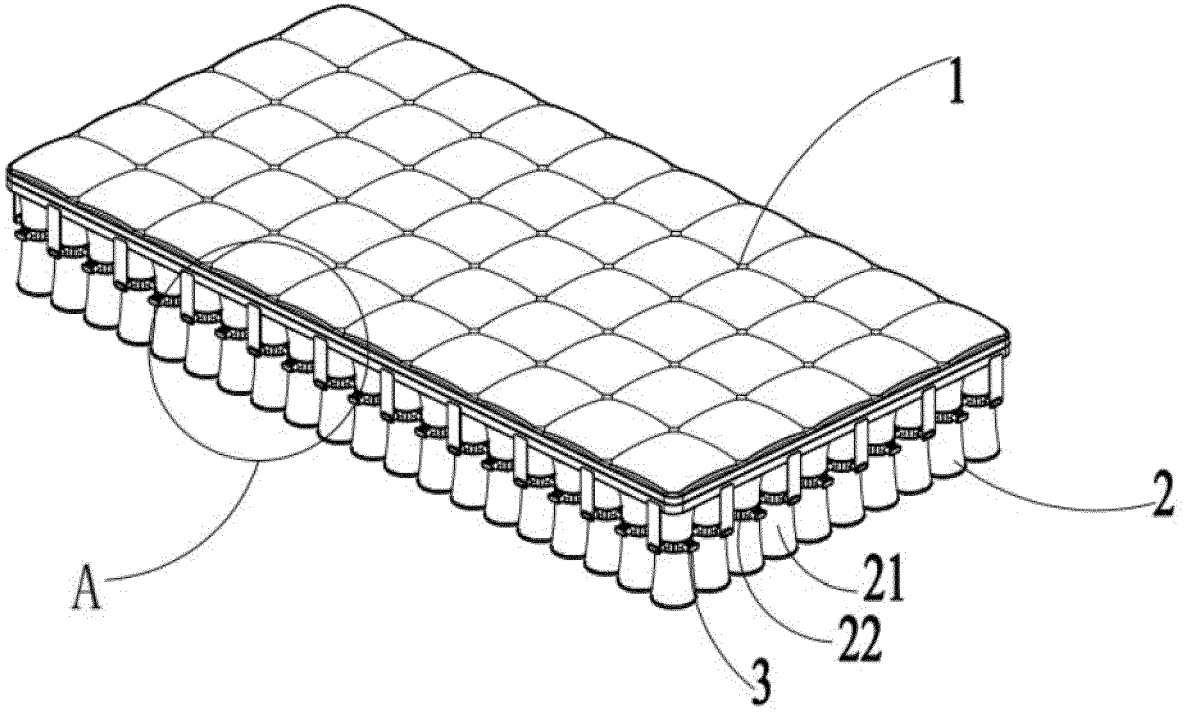

FIG. 1

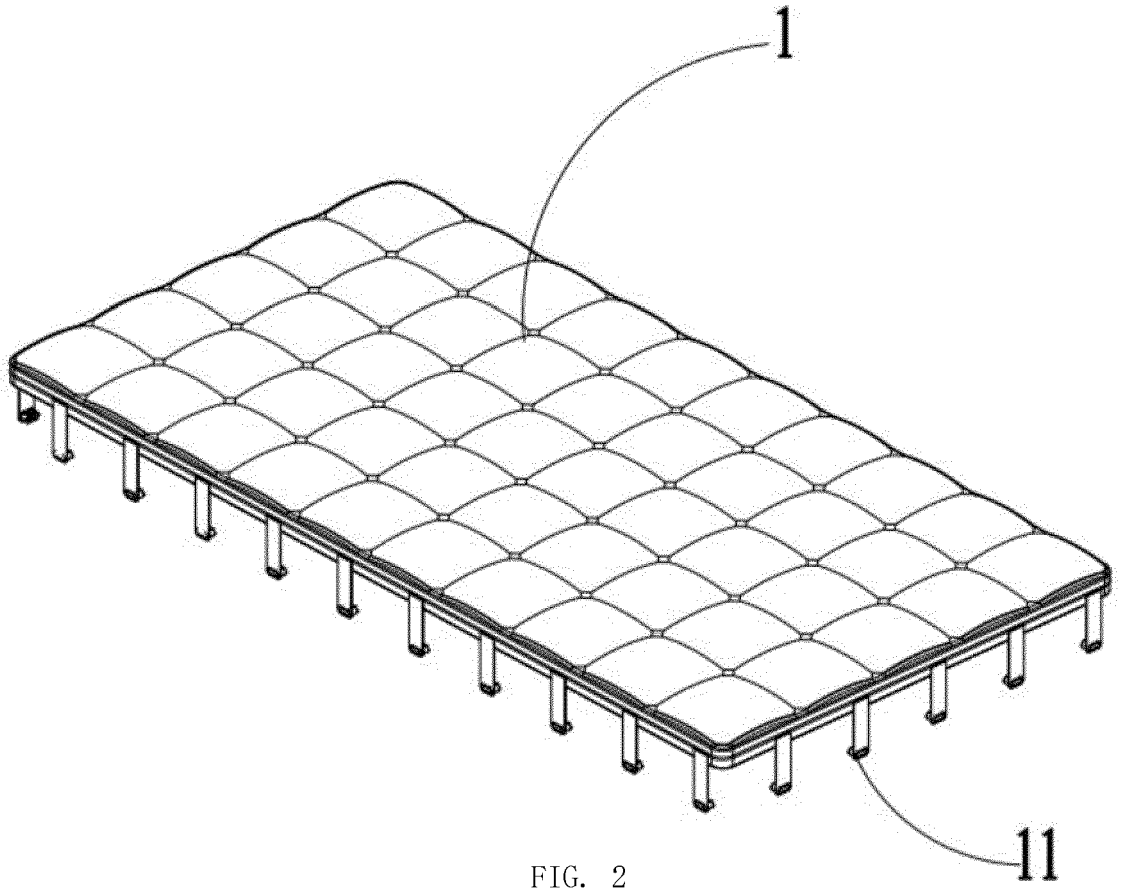

FIG. 2

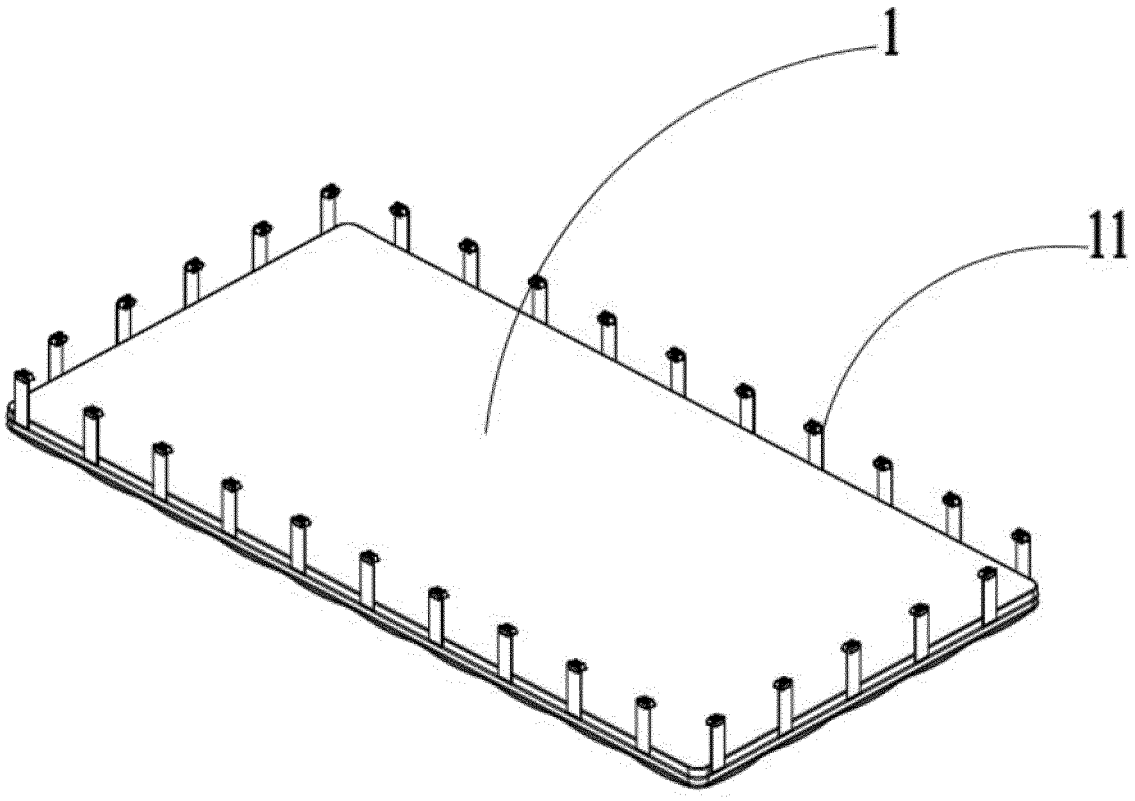

FIG. 3

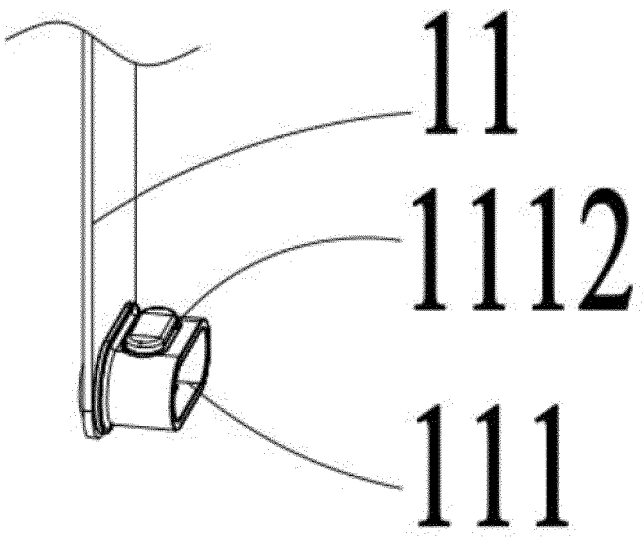

FIG. 4

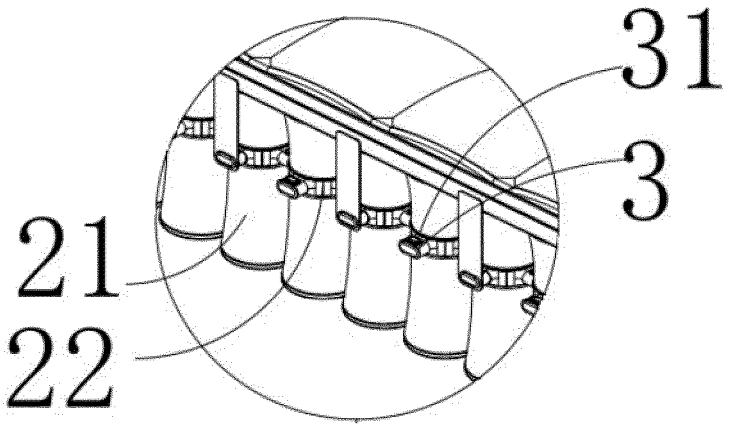

FIG. 5

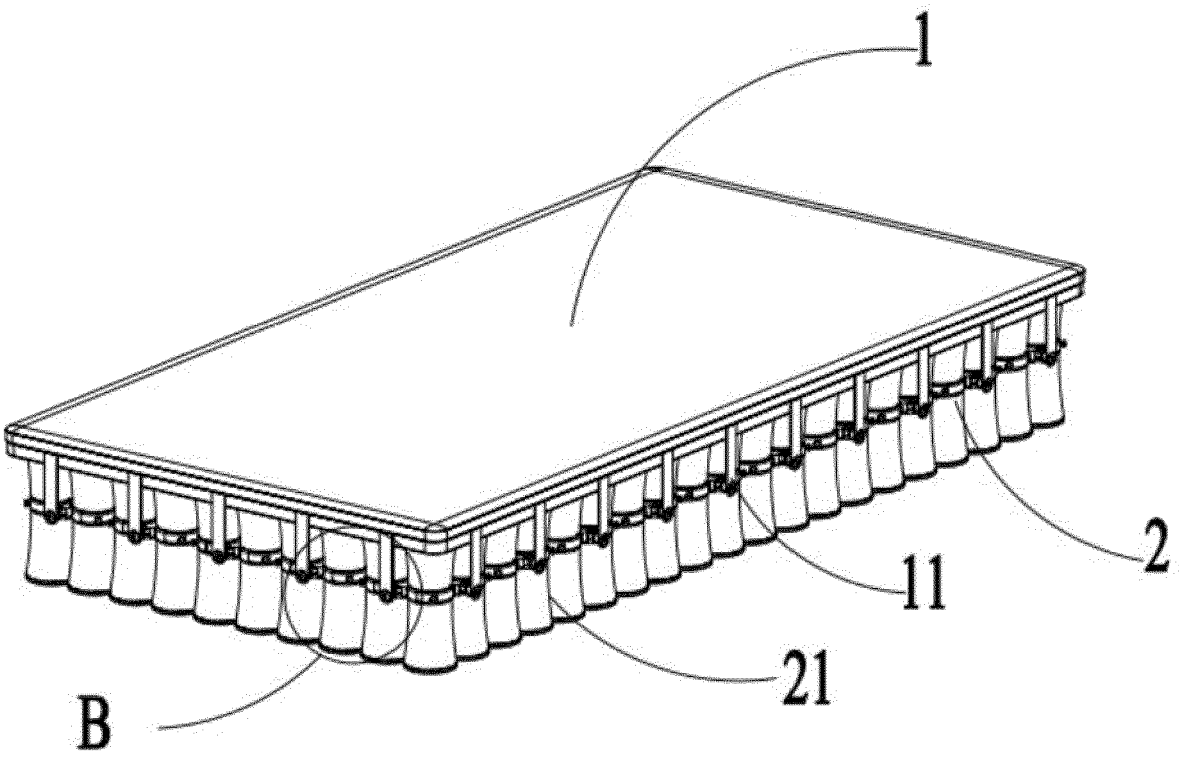

FIG. 6

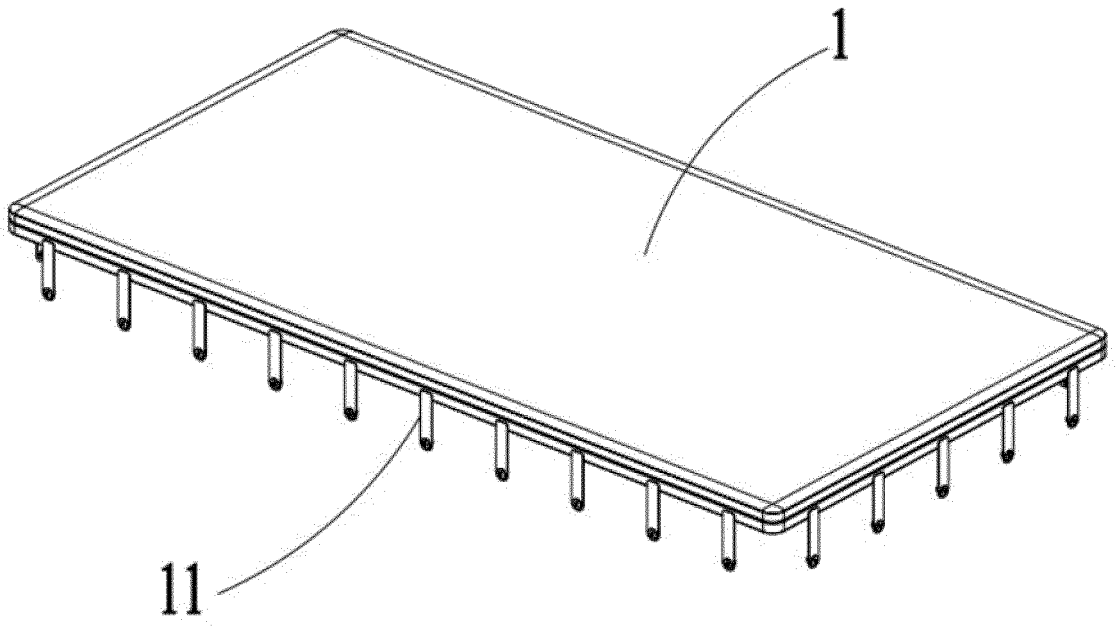

FIG. 7

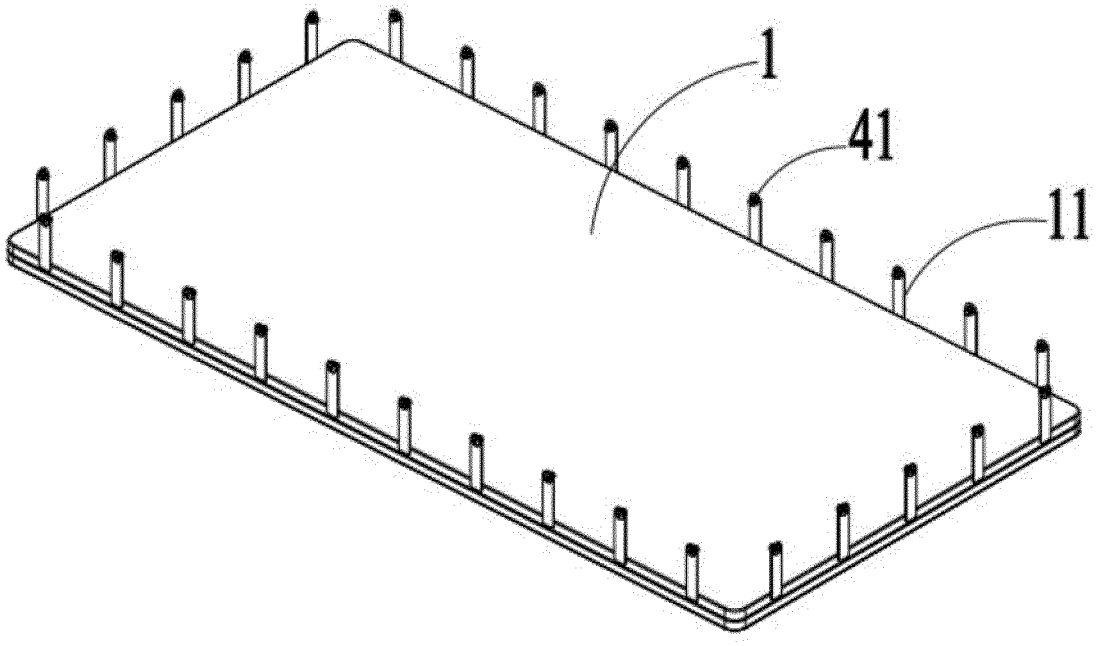

FIG. 8

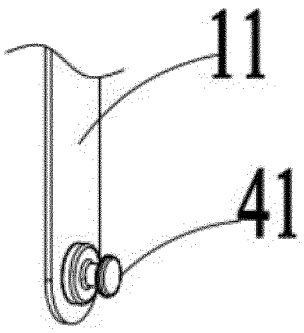

FIG. 9

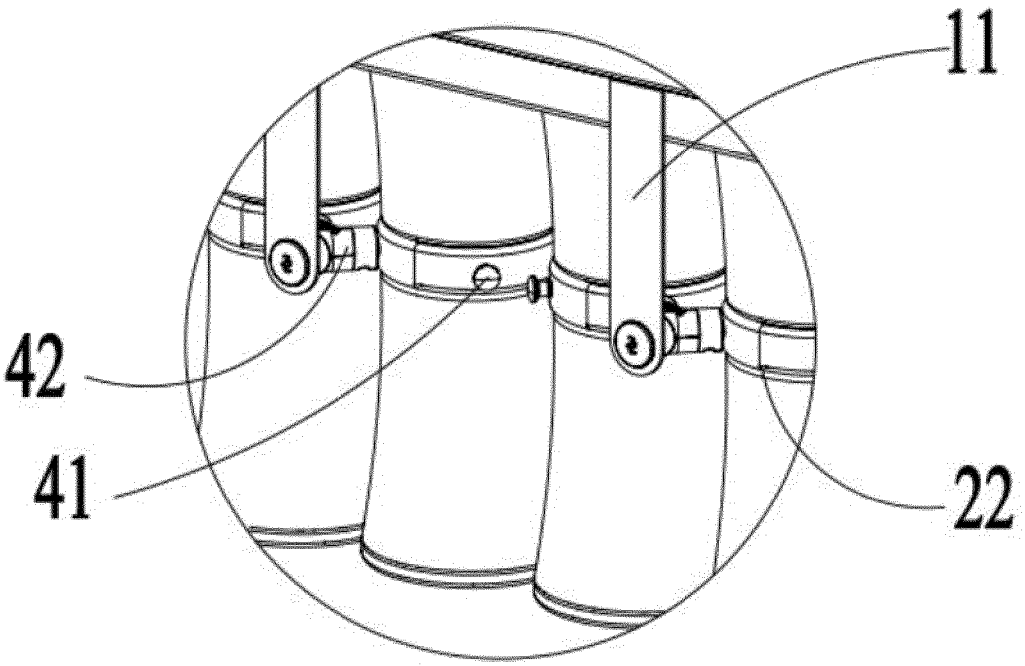

FIG. 10

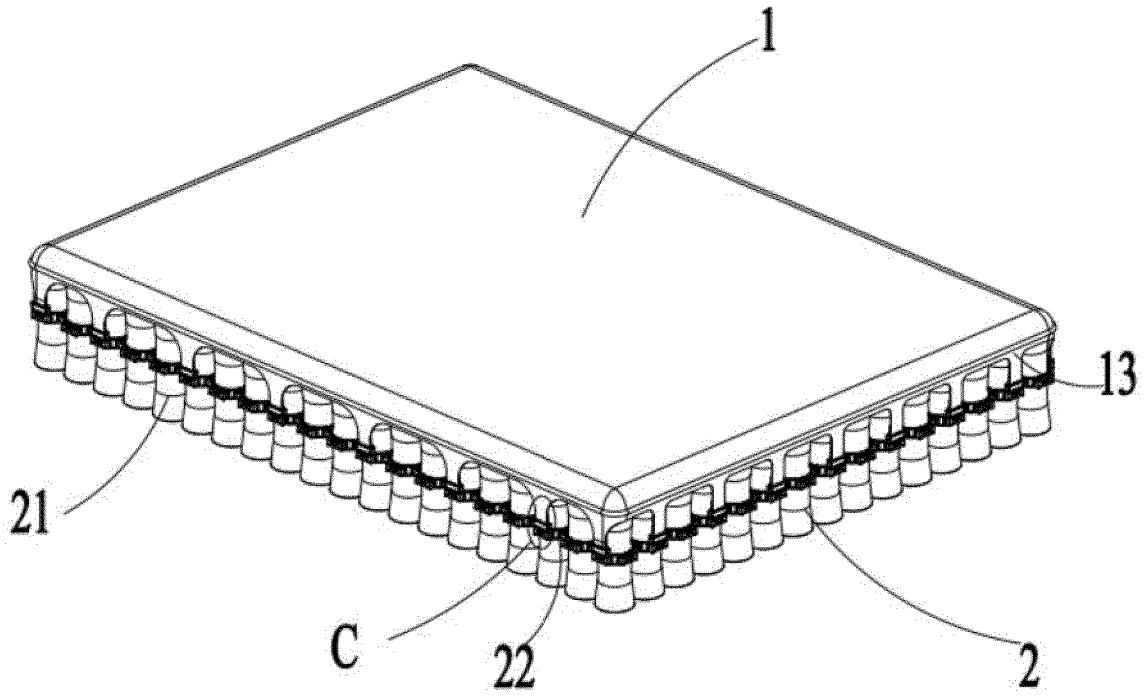

FIG. 11

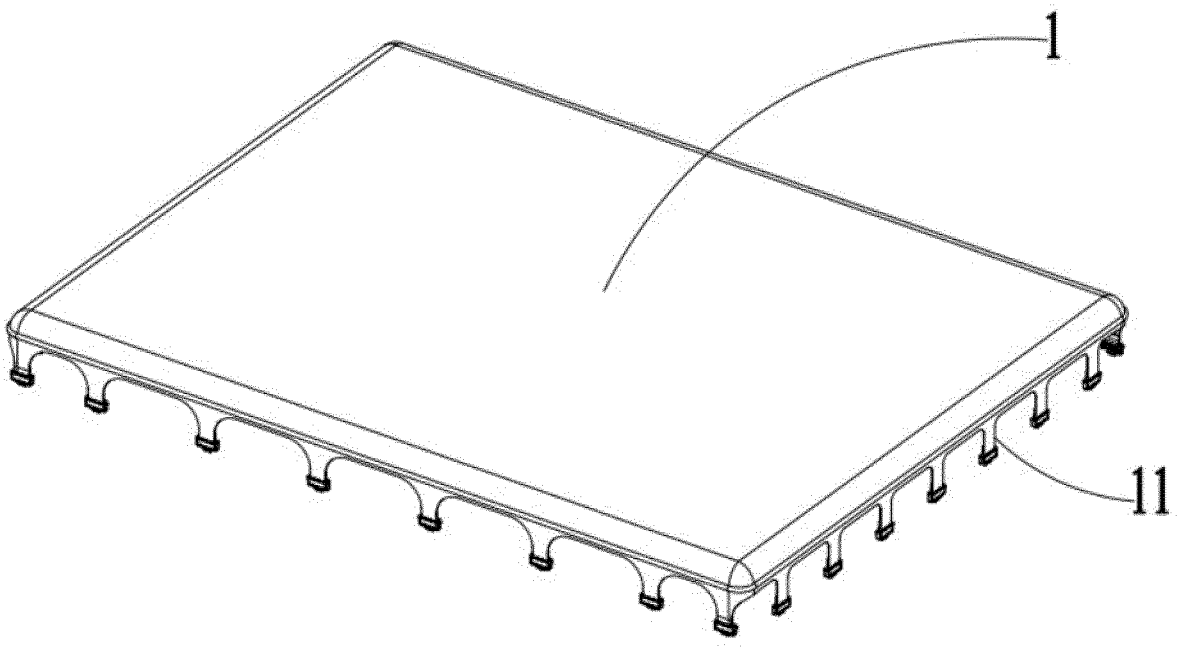

FIG. 12

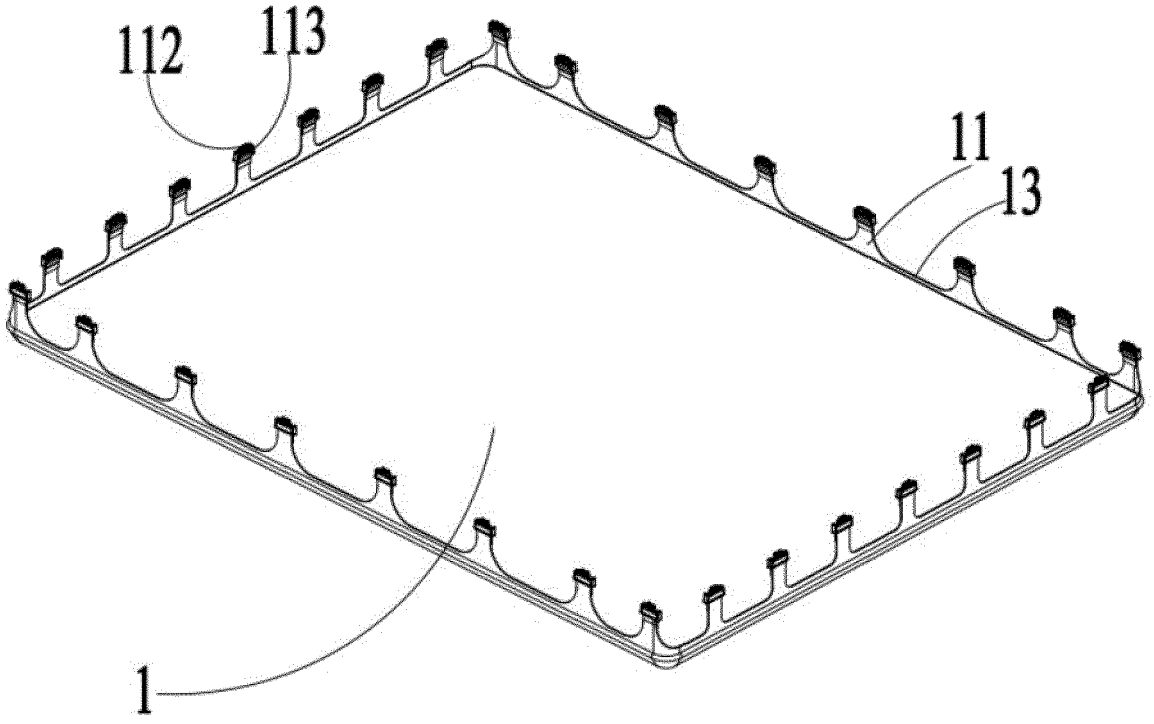

FIG. 13

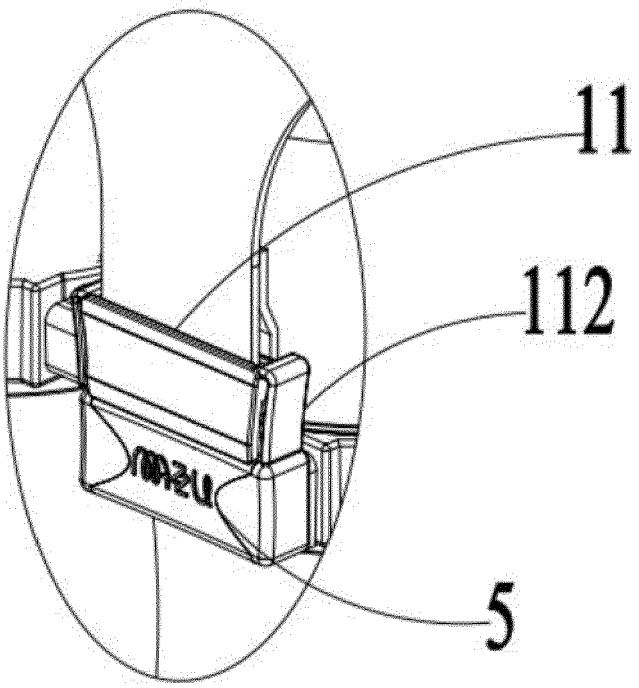

FIG. 14

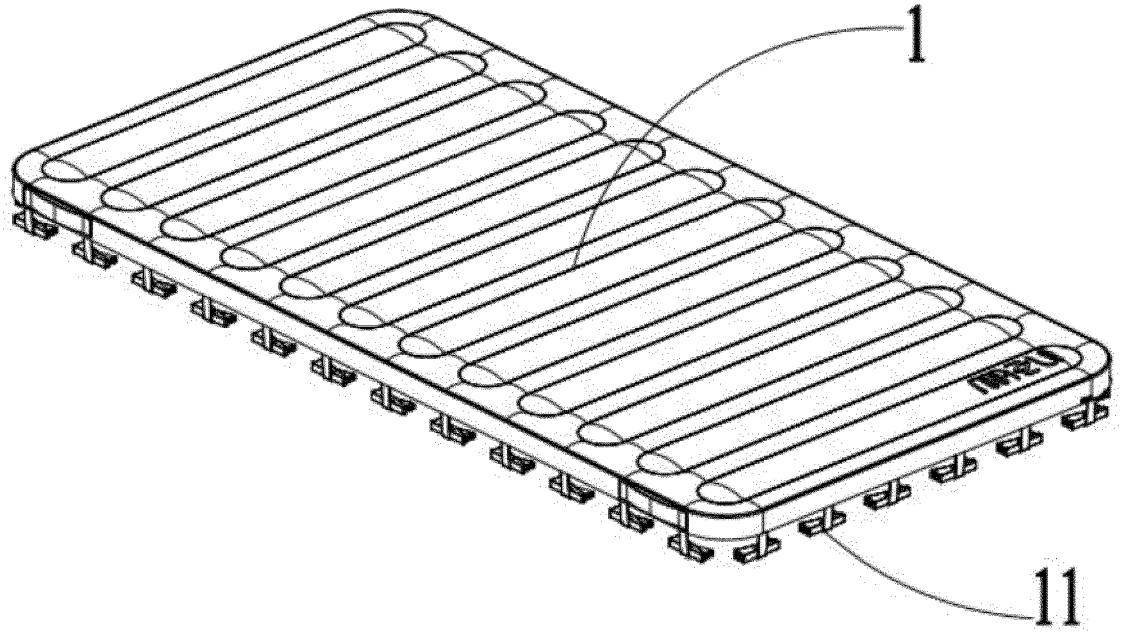

FIG. 15

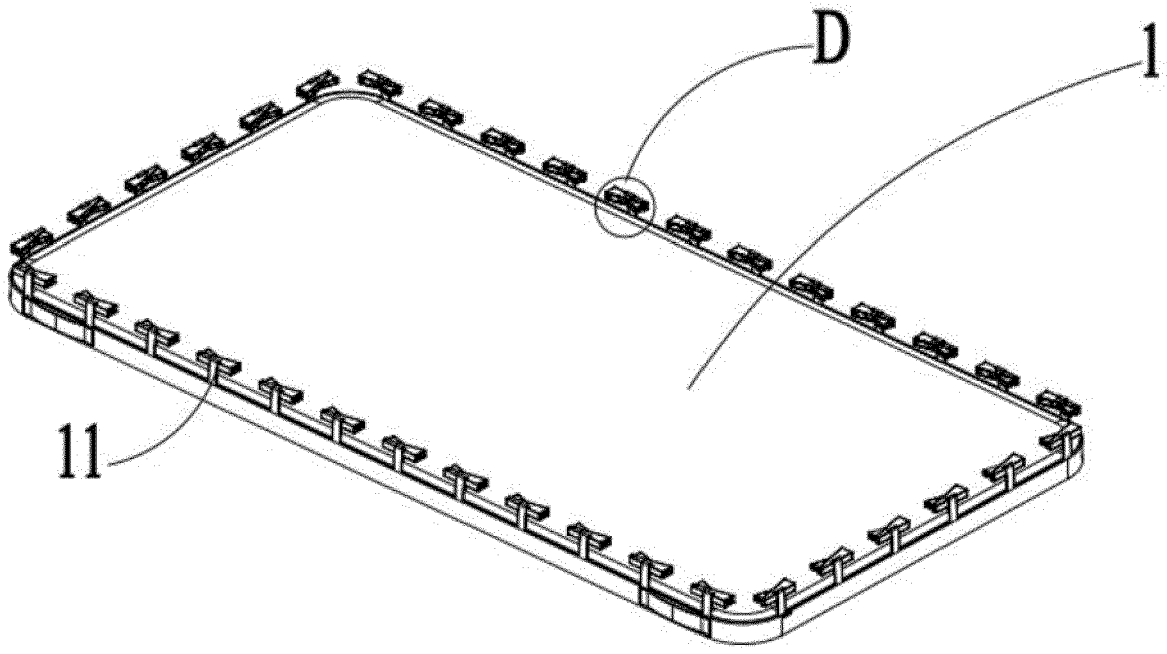

FIG. 16

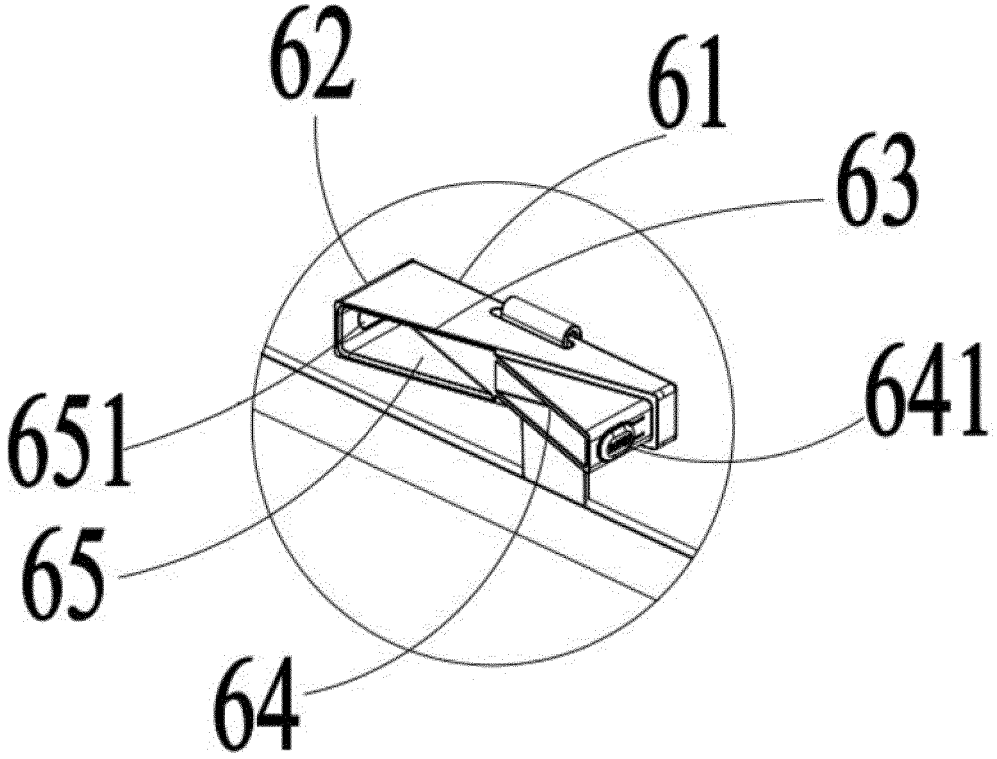

FIG. 17

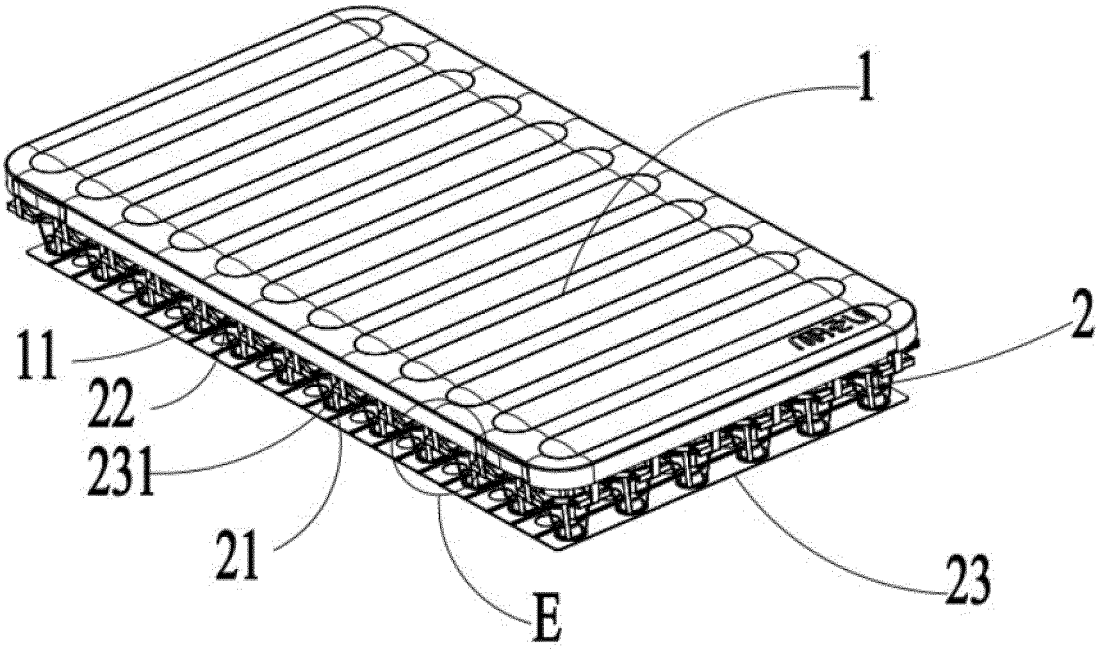

FIG. 18

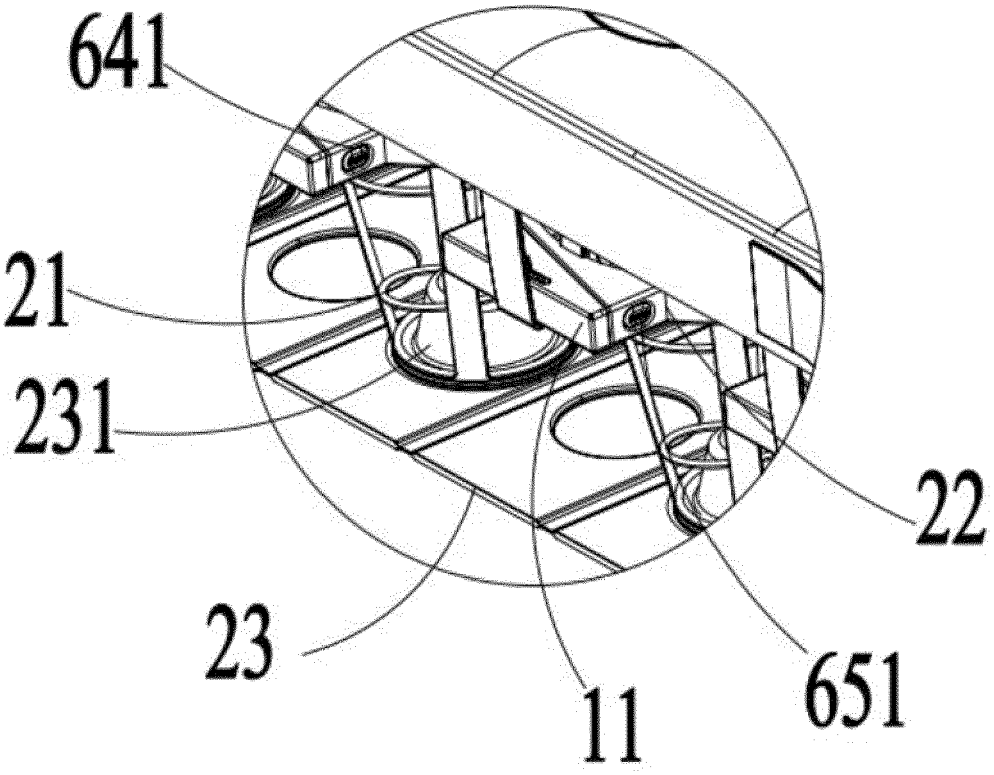

FIG. 19

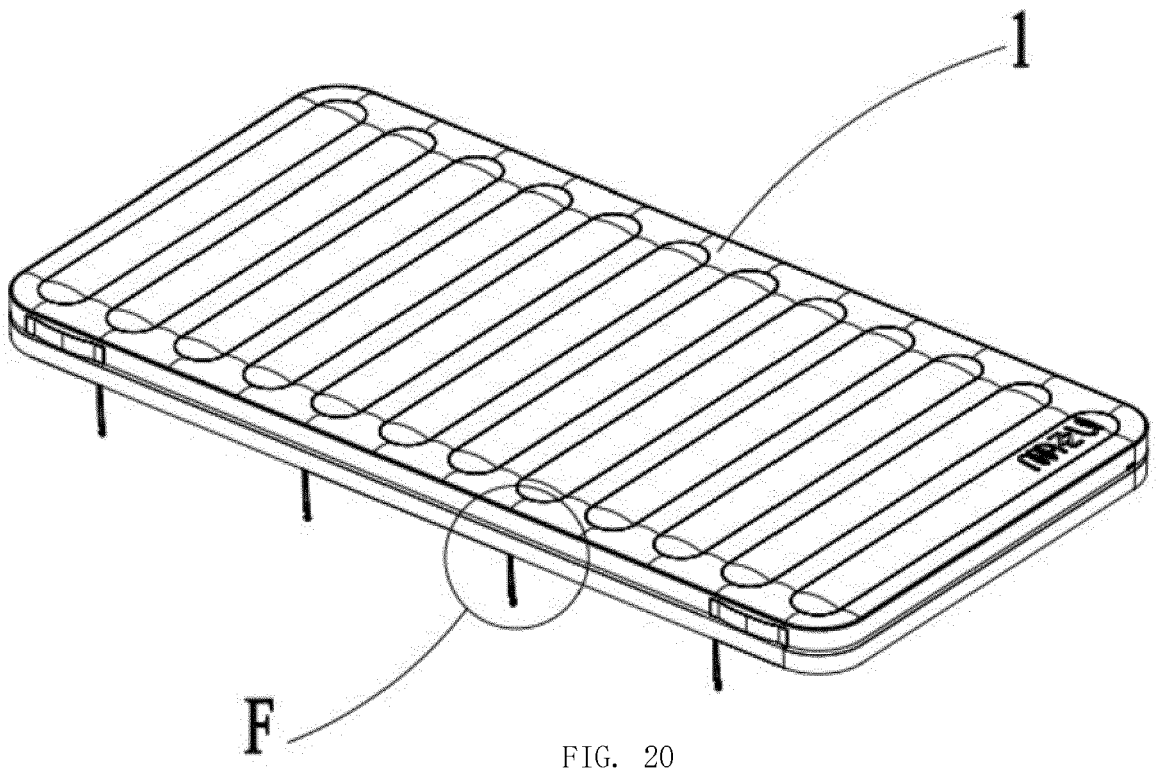

FIG. 20

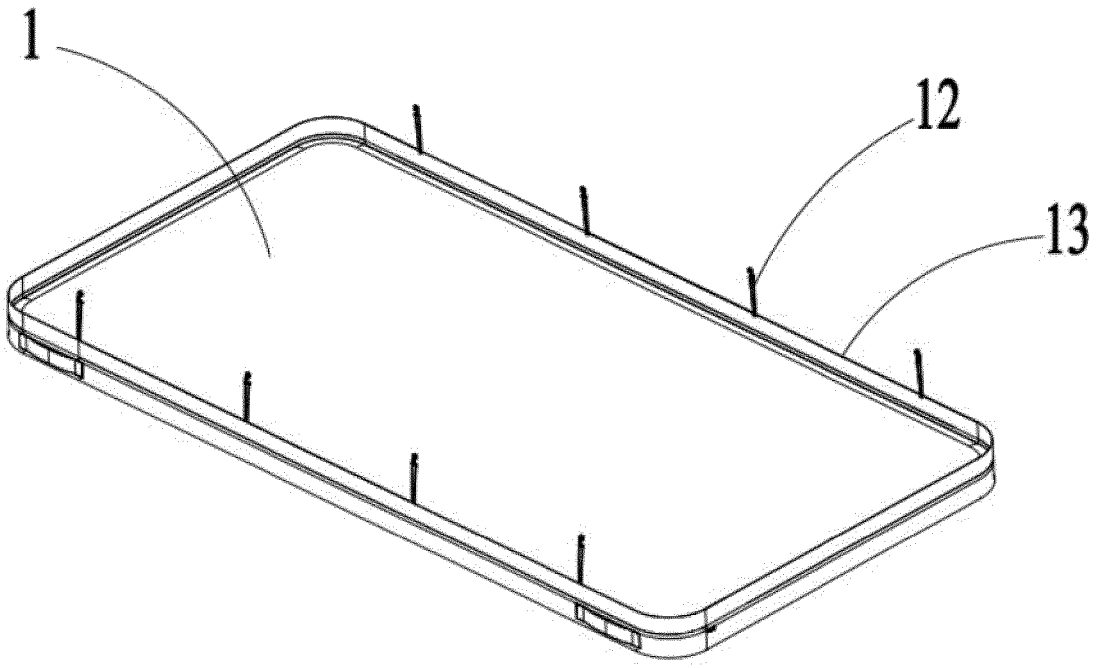

FIG. 21

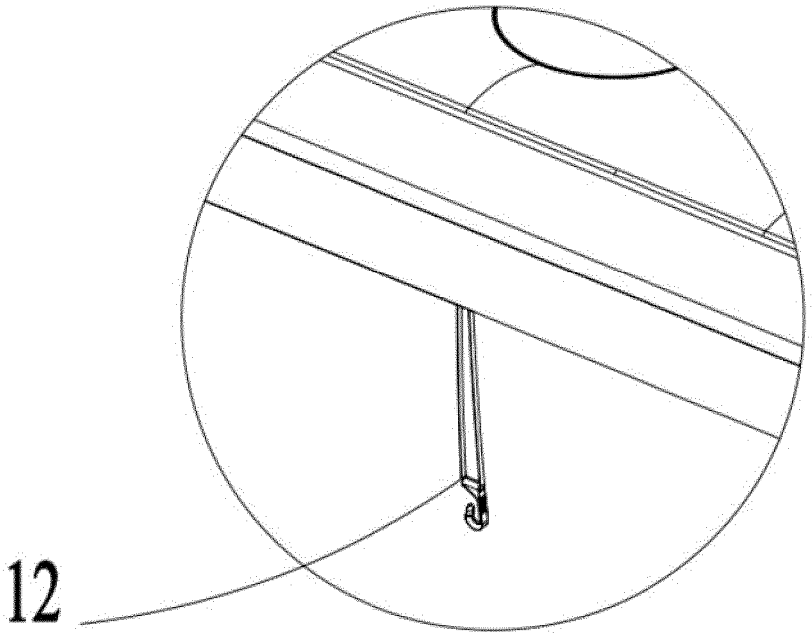

FIG. 22

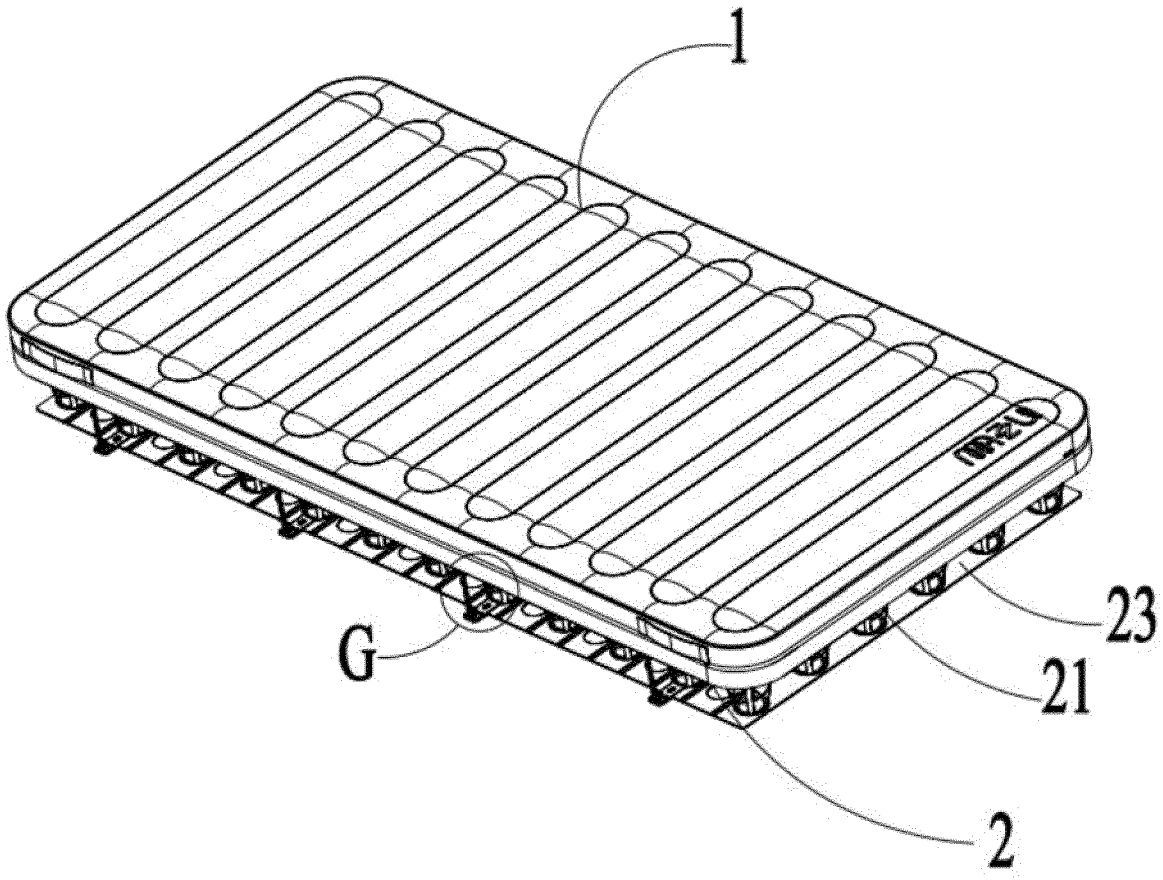

FIG. 23

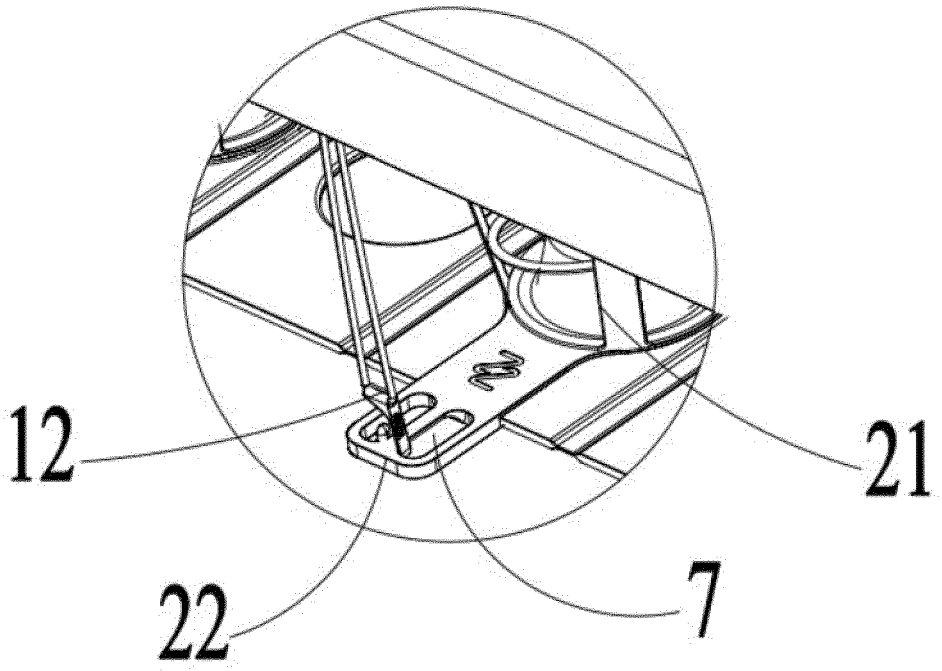

FIG. 24

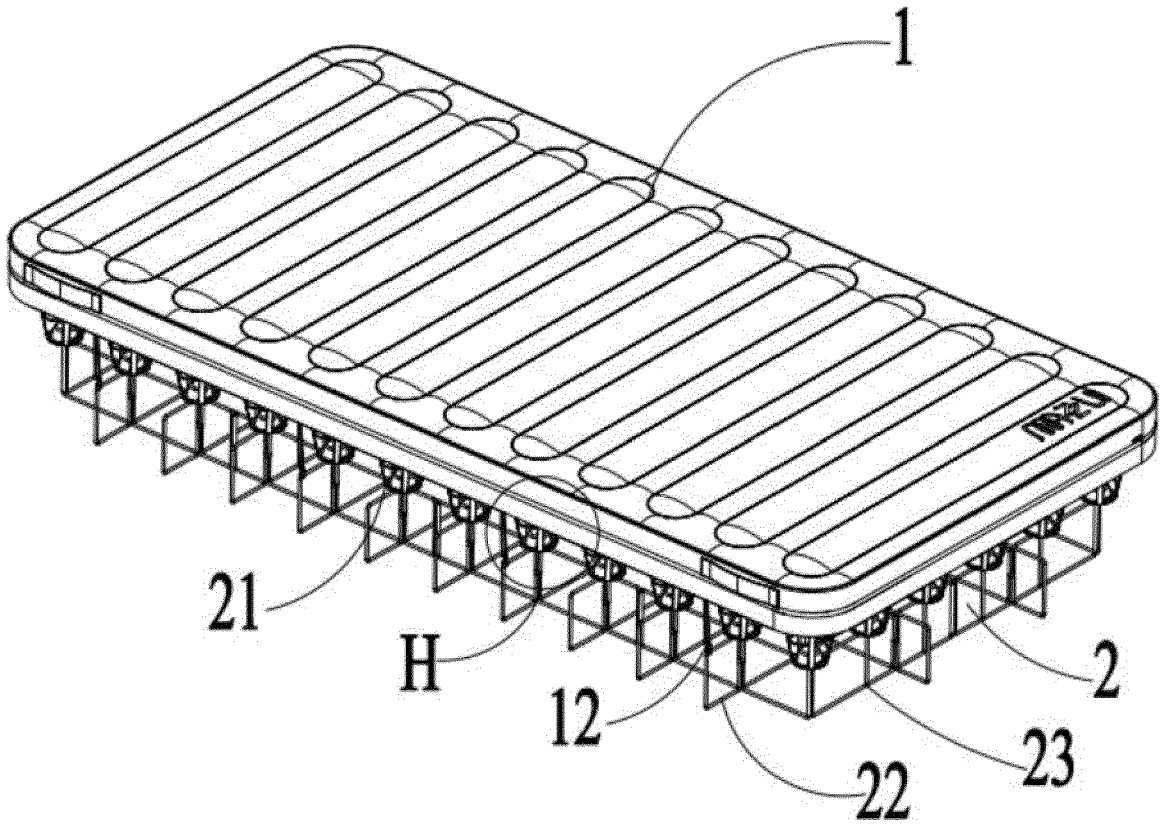

FIG. 25

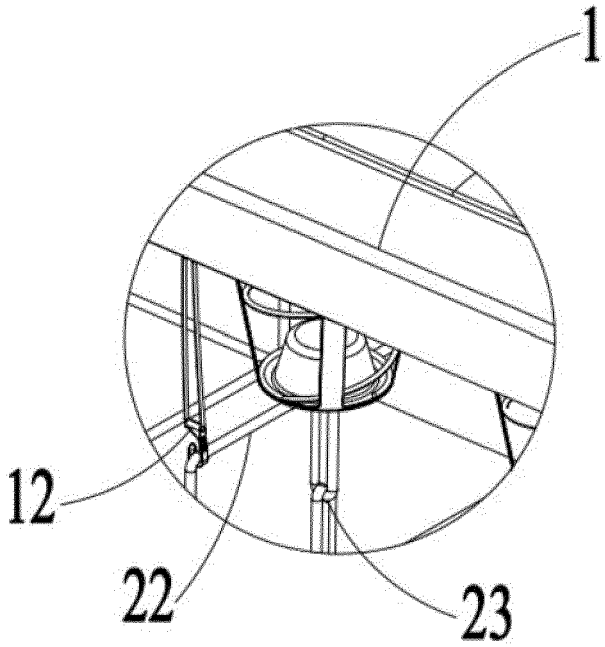

FIG. 26

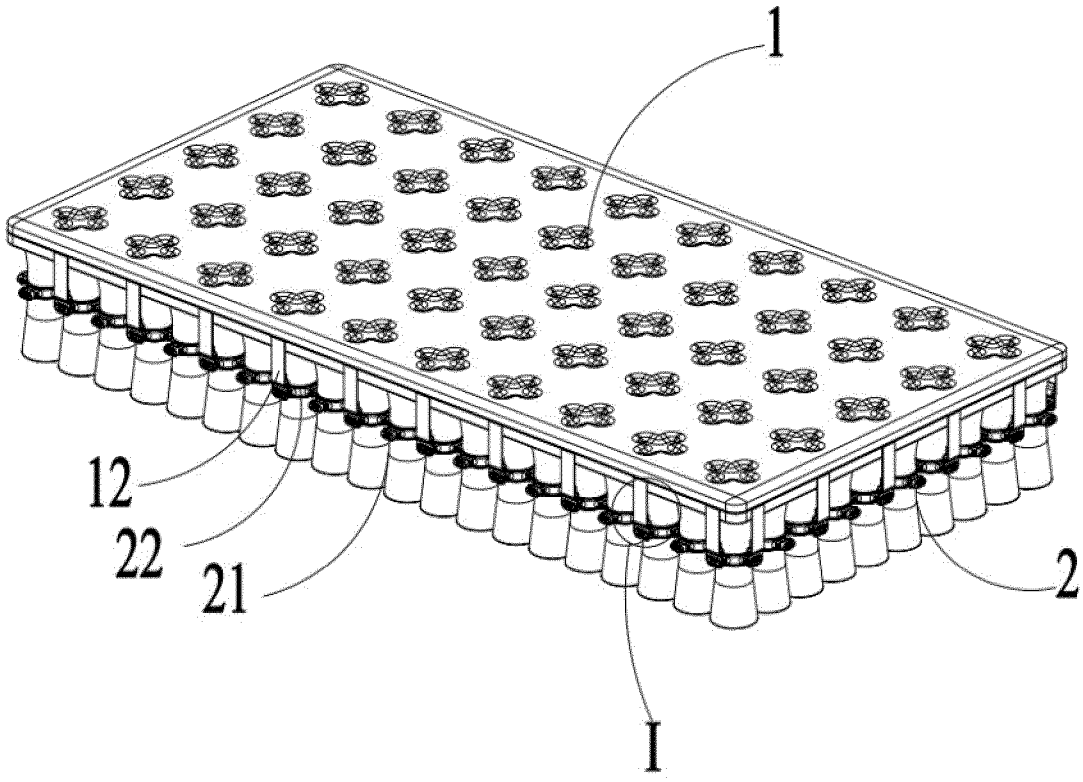

FIG. 27

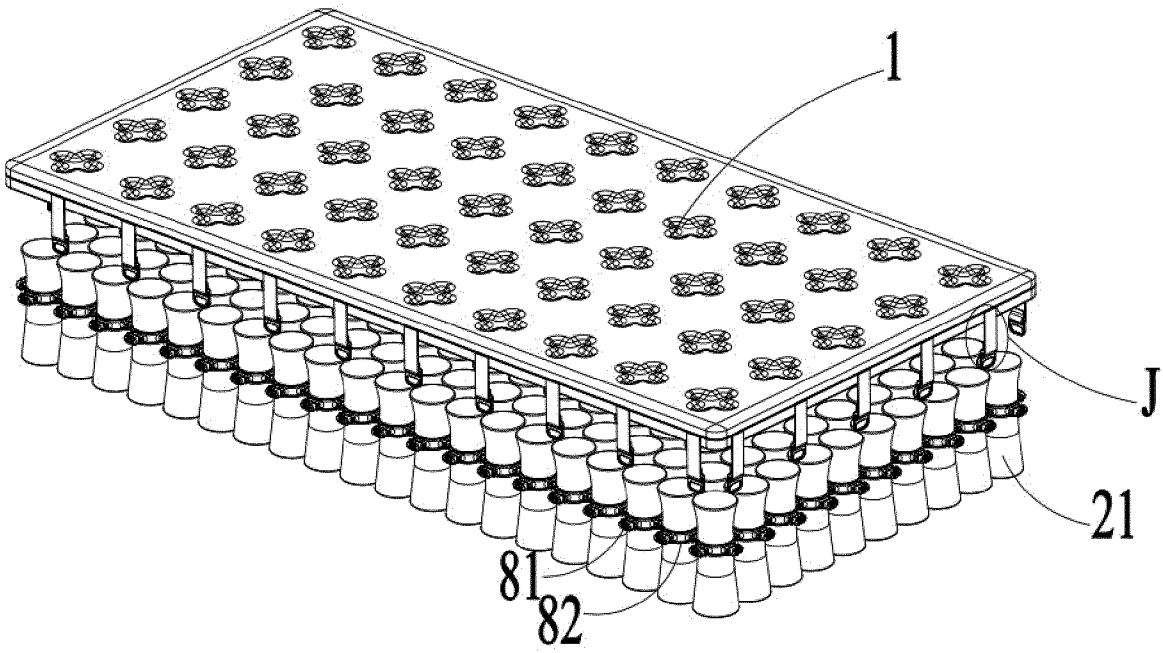

FIG. 28

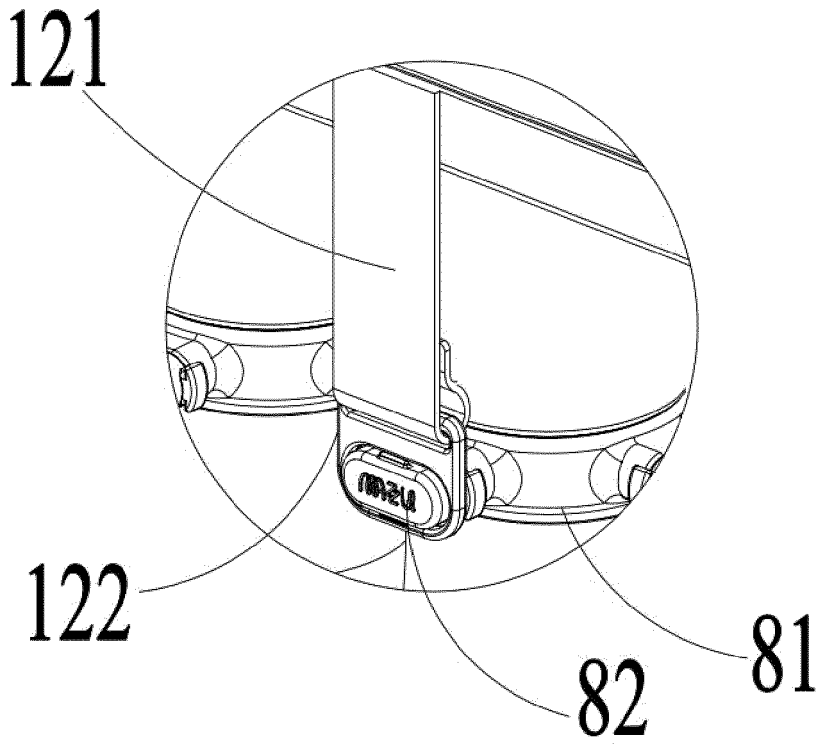

FIG. 29

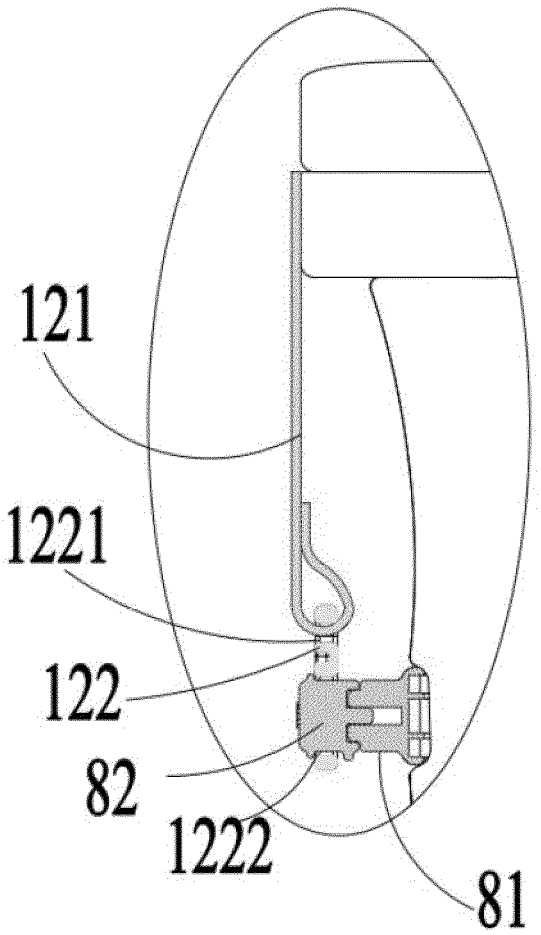

FIG. 30

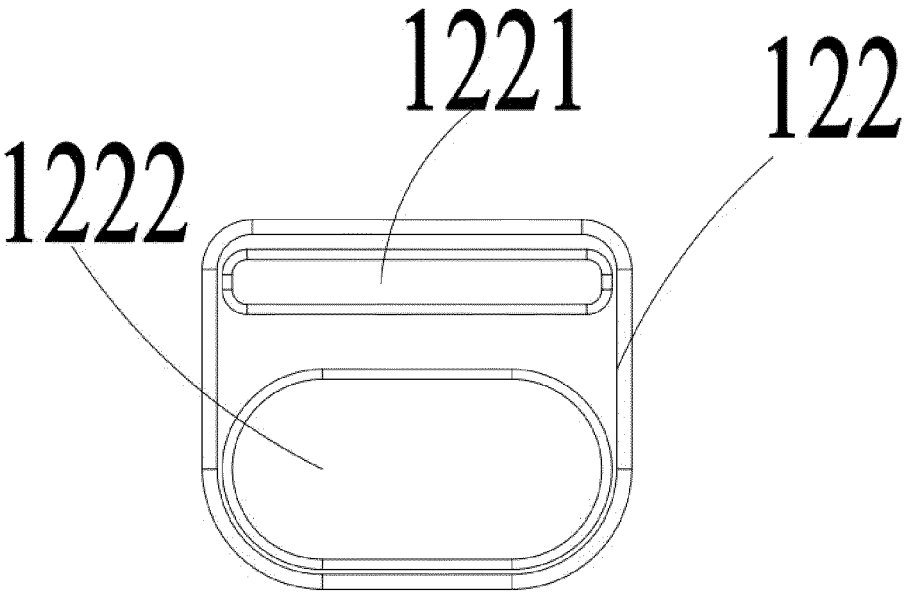

FIG. 31

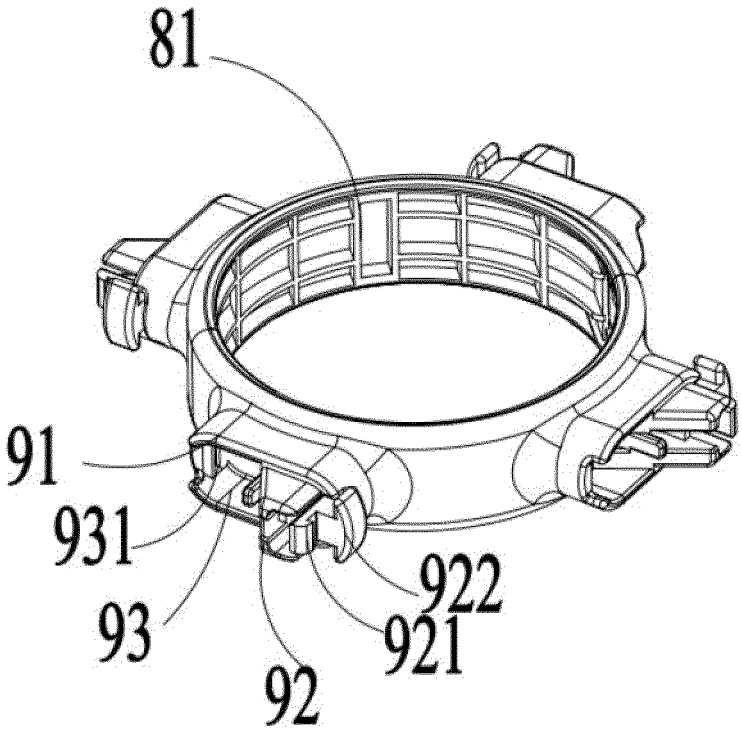

FIG. 32

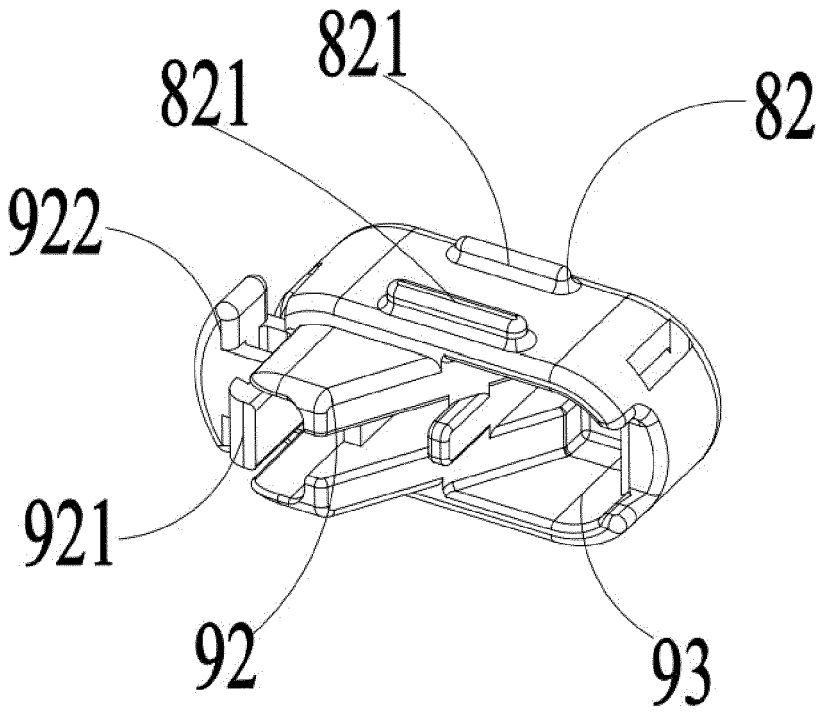

FIG. 33

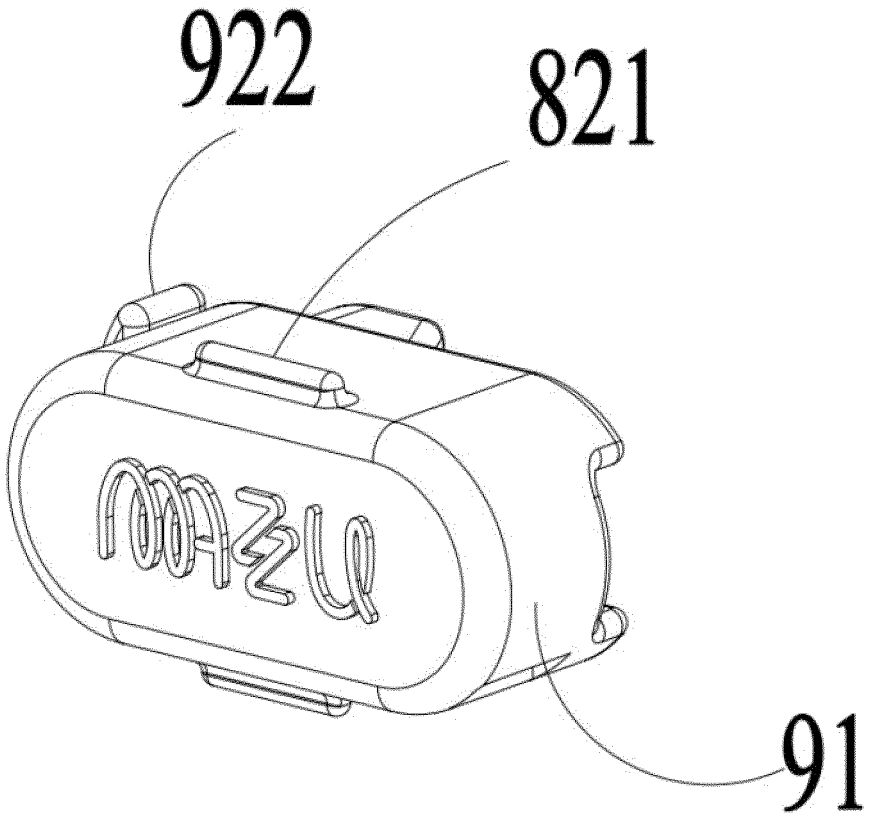

FIG. 34

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 22 0234

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,P	EP 4 470 423 A1 (NEW TEC INTEGRATION XIAMEN CO LTD [CN]) 4 December 2024 (2024-12-04) * paragraph [0022] - paragraph [0027]; figures 1-7 *	1-5,7,8, 10	INV. A47C23/00 A47C27/045 A47C27/06 A47C27/07 A47C27/05
X,P	WO 2024/055559 A1 (NEW TEC INTEGRATION XIAMEN CO LTD [CN]) 21 March 2024 (2024-03-21) * page 8 - page 19; figures 1-35 *	1-8,10	
X,P	WO 2024/055563 A1 (NEW TEC INTEGRATION XIAMEN CO LTD [CN]) 21 March 2024 (2024-03-21) * page 6 - page 14; figures 1-24 *	1-10	
X	CN 115 670 171 A (NEW TEC INTEGRATION XIAMEN CO LTD) 3 February 2023 (2023-02-03) * paragraph [0049] - paragraph [0079]; figures 1-15 *	1-10	TECHNICAL FIELDS SEARCHED (IPC)
X	CN 116 548 774 A (NEW TEC INTEGRATION XIAMEN CO LTD) 8 August 2023 (2023-08-08) * paragraph [0091] - paragraph [0150]; figures 1-31 *	1-10	A47C
X	CN 115 813 150 A (NEW TEC INTEGRATION XIAMEN CO LTD) 21 March 2023 (2023-03-21) * paragraph [0096] - paragraph [0153]; figures 1-42 *	1-10	
X	CN 116 763 095 A (NEW TEC INTEGRATION XIAMEN CO LTD) 19 September 2023 (2023-09-19) * paragraph [0034] - paragraph [0045]; figures 1-21 *	1-10	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 April 2025	Kus, Slawomir

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 22 0234

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-04-2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 4470423 A1	04-12-2024	CN 119055066 A	03-12-2024
		EP 4470423 A1	04-12-2024
		US 2024398129 A1	05-12-2024
		WO 2024245416 A1	05-12-2024
WO 2024055559 A1	21-03-2024	CN 117752191 A	26-03-2024
		WO 2024055559 A1	21-03-2024
WO 2024055563 A1	21-03-2024	AU 2023340474 A1	10-04-2025
		CN 117338133 A	05-01-2024
		WO 2024055563 A1	21-03-2024
CN 115670171 A	03-02-2023	CN 115670171 A	03-02-2023
		DE 102023108695 A1	25-04-2024
		EP 4360508 A1	01-05-2024
		GB 2623844 A	01-05-2024
		US 11889926 B1	06-02-2024
		WO 2024087367 A1	02-05-2024
CN 116548774 A	08-08-2023	CN 115998114 A	25-04-2023
		CN 116548774 A	08-08-2023
		CN 118285645 A	05-07-2024
		WO 2024146231 A1	11-07-2024
CN 115813150 A	21-03-2023	CN 115813150 A	21-03-2023
		GB 2619789 A	20-12-2023
CN 116763095 A	19-09-2023	CN 116763095 A	19-09-2023
		EP 4458220 A1	06-11-2024
		US 2024365992 A1	07-11-2024
		WO 2024230483 A1	14-11-2024

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 202311720556 **[0001]**
- CN 202410413874 **[0001]**
- CN 115191779 A **[0004]**