



(11)

EP 4 825 269 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
21.10.2026 Bulletin 2026/43

(51) International Patent Classification (IPC):
A47C 27/06 ^(2006.01)

(21) Application number: **24903006.5**

(52) Cooperative Patent Classification (CPC):
A47C 23/05; A47C 27/06; A47C 27/07

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

(86) International application number:
PCT/CN2024/139443

(87) International publication number:
WO 2025/124591 (19.06.2025 Gazette 2025/25)

(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

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(30) Priority: **14.12.2023 CN 202323413292 U**

(54) **CONNECTABLE ELASTIC MODULE AND ELASTIC CUSHION**

(57) A connectable elastic module and an elastic cushion. The connectable elastic module comprises at least two elastic modules (100) that are detachably connected; each elastic module (100) is composed of a plurality of spring units (110) arranged in an array; each elastic module (100) further comprises connecting bases (200) sleeved on the middle portions of the spring units; each connecting base (200) has four connecting structures on the side surface of the corresponding spring unit (110); and each connecting structure comprises a connecting slot (210), the connecting slot (210) has an inner wall and an outer wall opposite to each other in the radial direction of the spring unit (110), the connecting slot (210) has two opposite side edges in the axial direction of the spring unit (110), and the connecting slot (210) is provided with openings on the two side edges and the outer wall. The peripheral spring units (110) of each elastic module (100) are provided with connecting insertion members inserted into the openings of the connecting slots (210), and two adjacent elastic modules (100) are connected by means of the connecting insertion members. The elastic modules (100) are detachably connected by means of the connecting structures, the structure is simple, and the operation is convenient; and the scaling of the size of the elastic module and the local replacement and cleaning of the elastic module can be achieved by means of the connection and disconnection of the elastic modules (100).

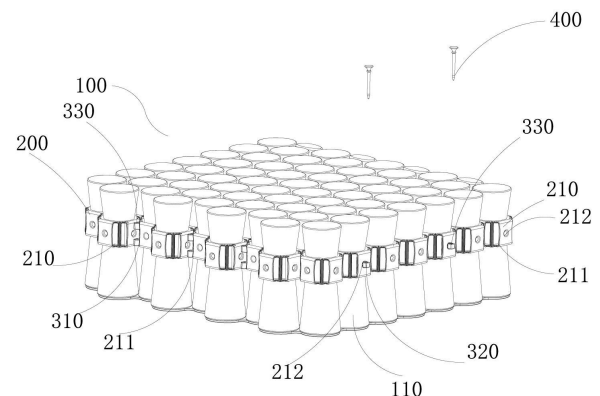


FIG. 1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202323413292.5, entitled "An interconnectable elastic module group and an elastic pad", filed with the China National Intellectual Property Administration on December 14, 2023, the content of said Chinese priority application is incorporated into the present disclosure by reference.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates to the technical field of elastic pads, and in particular relates to an interconnectable elastic module group and an elastic pad.

BACKGROUND OF THE DISCLOSURE

[0003] Furniture, such as spring beds and sofa beds, is indispensable in daily life of people. Most existing beds and sofa beds comprise elastic pads. The elastic pads have certain elasticity, and the elastic pads offer certain elastic support to possess a moderate level of comfort compared with rigid pads when a user lies on the beds and the sofa beds.

[0004] According to the 2021 New Consumption Trend Report on Mattresses, more than 49.8% of respondents reported using the same mattress for more than 5 years. However, mattresses or elastic pads have fixed dimensions and cannot be resized according to user needs. Moreover, prolonged use leads to local wear and sagging, mite infestation, and other issues, forcing users to replace or clean the entire elastic pad, this operation is inconvenient.

BRIEF SUMMARY OF THE DISCLOSURE

[0005] An objective of the present disclosure is to overcome the deficiencies of the existing techniques by providing an interconnectable elastic module group and an elastic pad comprising the interconnectable elastic module group, two elastic modules can be assembled or disassembled via connecting structures disposed on connecting seats, allowing users to perform partial replacement and cleaning of the elastic pad, or resize the elastic pad according to body shape changes or other factors.

[0006] The present disclosure has the following technical solutions.

[0007] An interconnectable elastic module group, it comprises at least two elastic modules that are detachably interconnected, an elastic module is constructed by a plurality of spring units arranged in a matrix, characterized in that, the elastic modules further comprise connecting seats sleeved on middle portions of the plurality of spring units, a connecting seat comprises

four connecting structures on side surfaces of a spring unit, a connecting structure comprises a connecting groove, the connecting groove has an inner wall and an outer wall opposite to each other in a radial direction of the spring unit, the connecting groove has two opposite side edges in an axial direction of the spring unit, the two side edges and the outer wall of the connecting groove comprises openings;

[0008] The plurality of spring units are assembled into a spring module by inserting connecting buckles into the connecting grooves on sides of adjacent ones of the spring units;

[0009] The spring units on an outer periphery of the spring modules comprise plug-in connectors inserted into the openings of the connecting grooves, and two adjacent ones of the elastic modules are connected via the plug-in connectors.

[0010] In some preferred embodiments, a plug-in connector comprises bodies inserted into the connecting grooves and axle holes parallel to an elastic force direction of the spring unit, the axle holes of the adjacent ones of the spring units are not on a same horizontal plane, and axle holes at two different heights are aligned and connected by a pin shaft.

[0011] Further preferably, the plug-in connector comprises a first plug-in connector, a second plug-in connector and the pin shaft that are cooperatively connected;

[0012] An end of the first plug-in connector comprises the axle holes that are coaxially spaced, and an end of the second plug-in connector comprises one of the axle holes;

[0013] The first plug-in connector and the second plug-in connector are cooperatively connected, and the axle hole of the second plug-in connector is located between two of the axle holes of the first plug-in connector.

[0014] Further preferably, a body of the first plug-in connector comprises two parallel insertion pieces, the two parallel insertion pieces are connected at one end, and the axle holes are formed at the one end where the two insertion pieces are connected;

[0015] The two insertion pieces of the first plug-in connector are respectively inserted into the connecting grooves on the two adjacent ones of the spring units, and the axle holes are located at a side edge of the connecting grooves.

[0016] Further preferably, a body of the first plug-in connector is an insertion piece, the axle holes are formed at one end of the insertion piece, the insertion piece is inserted into the openings on a side edge of the connecting groove, and the axle holes are located at the side edge of the connecting groove.

[0017] Further preferably, a body of the second plug-in connector is an insertion piece, the axle hole is formed at one end of the insertion piece, the insertion piece is inserted into the openings on a side edge of the connecting groove, and the axle hole is located at

the side edge the connecting groove.

[0018] Further preferably, a body of the second plug-in connector is a connecting post, an end of the connecting post comprises the axle hole, and another end of the connecting post is inserted into an opening on the outer wall of the connecting groove.

[0019] Further preferably, the second plug-in connector comprises an insertion piece and a connecting post, the axle hole seat is formed at an end of the connecting post, a middle portion of the insertion piece comprises a connecting post insertion hole, and another end of the connecting post is fittingly inserted into the connecting post insertion hole;

[0020] The insertion piece is inserted into the openings on a side edge of the connecting groove, the connecting post insertion hole at least partially overlaps an opening on the outer wall of the connecting groove, and the connecting post is sequentially inserted into the opening on the outer wall and the connecting post insertion hole.

[0021] Further preferably, a distance between the two of the axle holes of the first plug-in connector is equal to a length of the axle hole of the second plug-in connector in the elastic force direction.

[0022] The first plug-in connector and the second plug-in connector are connected, and the axle hole of the second plug-in connector is fitted between the two of the axle holes of the first plug-in connector.

[0023] An elastic pad, it comprises the interconnectable elastic module group.

[0024] The present disclosure has the following advantages.

1. The elastic module group provided by the present disclosure comprises at least two elastic modules, the elastic modules are detachably interconnected via connecting structures, featuring a simple structure and convenient operation, disassembly and assembly of the elastic modules facilitate implementation of resizing of the elastic module group, as well as partial replacement and cleaning of the elastic module group.

2. In some preferred embodiments, the elastic modules are connected via axle holes and pin shafts, thus rendering operation simple and convenient.

BRIEF DESCRIPTION OF THE DRAWING

[0025]

FIG. 1 illustrates a structural schematic view of an elastic module of Embodiment 1;

FIG. 2 illustrates a structural schematic view of another elastic module of Embodiment 1;

FIG. 3 illustrates a structural schematic view of a second plug-in connector of Embodiment 1;

FIG. 4 illustrates a structural schematic view of a

spring unit connected to the second plug-in connector of Embodiment 1;

FIG. 5 illustrates a structural schematic view of a first plug-in connector of Embodiment 1;

FIG. 6 illustrates a structural schematic view of a spring unit connected to the first plug-in connector of Embodiment 1;

FIG. 7 illustrates a schematic view of a connection between the spring unit connected to the second plug-in connector and the spring unit connected to the first plug-in connector of Embodiment 1;

FIG. 8 illustrates a schematic view of a connection of two elastic modules of Embodiment 1;

FIG. 9 illustrates a schematic view of an elastic module group formed by connecting the two elastic modules of Embodiment 1, at this time, an outer edge of a first component having the first plug-in connector is attached to an outer edge of a second component having the second plug-in connector;

FIG. 10 illustrates a top view of the elastic module group formed by assembling the two elastic modules of Embodiment 1;

FIG. 11 illustrates a structural schematic view of the elastic module group after further interconnection and extension of Embodiment 1;

FIG. 12 illustrates a top view of FIG. 11;

FIG. 13 illustrates a structural schematic view of an elastic module of Embodiment 2;

FIG. 14 illustrates an enlarged view of a portion A in FIG. 13;

FIG. 15 illustrates a structural schematic view of a second plug-in connector of Embodiment 2;

FIG. 16 illustrates a structural schematic view of a first plug-in connector of Embodiment 2;

FIG. 17 illustrates a schematic view of a connection of two spring units connected to the second plug-in connector and the first plug-in connector of Embodiment 2; FIG. 18 illustrates a structural schematic view of a second plug-in connector of Embodiment 3;

FIG. 19 illustrates a structural schematic view of a spring unit connected to the second plug-in connector of Embodiment 3;

FIG. 20 illustrates a structural schematic view of a first plug-in connector of Embodiment 3;

FIG. 21 illustrates a schematic view of a connection between two spring units connected to the first plug-in connectors and a spring unit connected to the second plug-in connector of Embodiment 3.

[0026] Reference numerals in the drawings: 100-elastic module; 110-spring unit; 120-filling unit; 200-connecting seat; 210-connecting groove; 211-side opening; 212-outer wall opening; 310-first plug-in connector; 320-second plug-in connector; 330-axle hole seat; 340-connecting post; 350-insertion piece; 351-connecting post insertion hole; 400-pin shaft.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0027] The technical solutions of the present disclosure will be further explained and described below with reference to specific embodiments.

[0028] The technical solutions in the embodiments of the present disclosure are clearly and completely described below in combination with the accompanying drawings in the embodiments of the present disclosure. It is obvious that the described embodiments are preferred embodiments of the present disclosure and shall not be construed as exclusion of other embodiments. All other embodiments shall fall within the protection scope of the present disclosure provided that they are obtained by a person of ordinary skill in the art without creative efforts based on the embodiments of the present disclosure.

[0029] In the claims, the specification and the drawings of the present disclosure, unless otherwise explicitly defined, directional terms such as "height", "upper end", "top", "bottom", "inner", "outer", "upper", "lower", "front", and "rear" indicate orientations or positional relationships based on the orientations or the positional relationships shown in the accompany drawings, which are only used to facilitate description of the present disclosure and simplify the description rather than indicating or implying that the referred device or element should have a specific orientation or be constructed and operated in the specific orientation, and thus shall not be construed as limiting the specific protection scope of the present disclosure.

Embodiment 1

[0030] An interconnectable elastic module group comprises elastic modules 100 that are configured to be detachably interconnected and connecting seats 200.

[0031] FIGS. 1 and 2 show structures of two elastic modules 100 in the elastic module group provided in this embodiment, and an elastic module 100 comprises spring units 110 and the connecting seats 200 sleeved on middle portions of the spring units 110. As shown drawings, in this embodiment, a spring unit 110 is a waist-contracted spring, and a cross-sectional diameter of the spring unit first decreases and then increases from bottom to top, a connecting seat 200 is sleeved on a middle portion of the spring unit 110 with a smaller cross-sectional area, which alleviates a problem of increased spacing between the spring units 110 and decreased density of the spring units 110 in the elastic module caused by sleeving of the connecting seats 200 to a certain extent.

[0032] The spring units 110 on an outer periphery of the elastic modules 100 are all sleeved with the connecting seats 200, the connecting seat 200 comprises four connecting structures on side surfaces of the spring unit 110, a connecting structure comprises a

connecting groove 210, the connecting groove 210 has an inner wall and an outer wall opposite to each other in a radial direction of the spring unit 110, the connecting groove 210 has two opposite side edges in an axial direction of the spring unit 110, and the connecting groove 210 comprises openings on the two side edges and the outer wall, and the openings are respectively side openings 211 and an outer wall opening 212.

[0033] Adjacent ones of the spring units 110 are aligned via the connecting grooves 210 on sides, and multiple ones of the spring units 110 in a staggered arrangement are assembled into the elastic module 100 by inserting connecting buckles (not shown in drawings), and the plug-in connectors are disposed on the spring units 110 on an outer periphery of the spring module 100. The plug-in connectors are inserted into the openings of the connecting grooves 210, and adjacent two of the elastic modules 100 are connected via the plug-in connectors.

[0034] A plug-in connector comprises a first plug-in connector 310, a second plug-in connector 320, and a pin shaft 400 that are cooperatively connected, and the first plug-in connector 310 and the second plug-in connector 320 are detachably disposed on the connecting seat 200 via the connecting grooves 210. The first plug-in connector 310 and the second plug-in connector 320 respectively comprise axle hole seats 330 parallel to an elastic force direction of the spring unit 110, and the axle hole seats 330 of adjacent ones of the spring units 110 are not on a same horizontal plane. The axle hole seats 330 of the first plug-in connector 310 and the second plug-in connector 320 are aligned in the elastic force direction and connected by inserting the pin shaft 400 into axle holes.

[0035] As shown in FIGS. 3 and 4, a body of the second plug-in connector 320 is a connecting post 340, an end of the connecting post 340 comprises one of the axle hole seats 330, and another end of the connecting post 340 is inserted into the outer wall opening 212, such that the axle hole 330 is disposed on an outer wall of the connecting groove 210.

[0036] As shown in FIGS. 5 and 6, a body of the first plug-in connector 310 is an insertion piece 350, an end of the insertion piece 350 comprises two of the axle hole seats 330 that are coaxially spaced in the elastic force direction, and a distance between the two of the axle holes 330 is equal to a length of the axle hole 330 of the second plug-in connector 320 in the elastic force direction. The first plug-in connector 310 is inserted into the side openings 211, and the axle holes 330 are located at a side edge of the connecting groove 210.

[0037] FIGS. 7 and 8 illustrate alignment and connection between the first plug-in connector 310 and the second plug-in connector 320, as the axle holes 330 of the first plug-in connector 310 are located at the side edge of the connecting groove 210 and the axle hole 330 of the second plug-in connector 320 is located at the outer wall of the connecting groove 210, the spring

units 110 are arranged in a staggered manner when the two are cooperatively connected, which increases the density of the spring units 110 in the elastic module group and the elastic module 100 to provide better support and resilience.

[0038] Furthermore, the two of the axle hole seats 330 of the first plug-in connector 310 are fitted with the axle hole seat 330 of the second plug-in connector 320, thus restricting relative displacement between the two of the elastic modules in the elastic force direction and enhancing connection stability. In other possible implementations, the distance between the two of the axle hole seats 330 of the first plug-in connector 310 can also be greater than the length of the axle hole seat 330 of the second plug-in connector 320 in the elastic force direction.

[0039] As shown in FIGS. 7 and 8, the second plug-in connector 320 on an outer edge of the elastic module 100 shown in FIG. 1 cooperates with the first plug-in connector 310 on an outer edge of the elastic module 100 shown in FIG. 2, and the elastic module group as shown in FIGS. 9 and 10 is interconnected by inserting the pin shaft 400.

[0040] In this embodiment, the first plug-in connectors 310 are inserted into the connecting seats 200 sleeved on three of the spring units 110 on an outer edge of an elastic module 100, and the second plug-in connectors 320 are inserted into the connecting seats 200 sleeved on two of the spring units 110 on another outer edge. In other possible implementations, the two of the elastic modules 100 can be interconnected as long as the first plug-in connector 310 and the second plug-in connector 320 are respectively disposed on outer edges of the two of the elastic modules 100. Preferably, two or more of the connecting seats 200 connected to the first plug-in connector 310 and/or the second plug-in connector 320 are disposed on the outer edges of the elastic modules 100, such that an interconnection between the two of the elastic modules 100 becomes more stable by a two-point or multi-point connection.

[0041] In this embodiment, each of the spring units 110 is sleeved with the connecting seat 200 and connected together via the connecting structure. However, the connecting structures disposed on the spring units 110 inside the spring modules 100 are not described in detail in this embodiment, as with the proceeding examples, as long as ends of the plug-in connectors cooperate to form a detachably connectable structure, such as a matching buckle and groove, or the plug-in connectors can be the first plug-in connector 310 and the second plug-in connector 320 described above.

[0042] FIGS. 11 and 12 are schematic views of the elastic module group of this embodiment after further interconnection and extension, wherein the elastic module group comprises six of the elastic modules 100.

[0043] It can be seen that the arrangement of the first plug-in connector 310 and the second plug-in connector 320 enables staggered arrangement of the spring units 110, each of spring units 110 is adjacent to six of the spring units 110 to form a hexagonal shape, and this arrangement achieves a densest arrangement of the spring units 110, thus imparting favorable support and resilience to the elastic module group. However, in this arrangement, multiple ones of the spring units 110 in the staggered arrangement can affect appearance regularity of the elastic modules 100 and the elastic module group and user experience, therefore, in this embodiment, the elastic modules 100 further comprise filling units 120, the filling units 120 are sleeved with the connecting seats 200, and connecting structures (not shown in drawings) are disposed on the connecting seats 200 sleeved on the filling units 120, the filling units 120 are interconnected to outer peripheral ones of the spring units 110 via the connecting structures to render the outer edges of the elastic modules 100 more regular. Specifically, cross-sections of the filling units 120 are elliptical, on a same horizontal plane, a major axis of the cross-section of the filling units 120 is equal to a diameter of cross-sections of the spring units 110, and a minor axis of the cross-sections of the filling units 120 is equal to a radius of the cross-sections of the spring units 110. In other possible implementations, a spring unit 110 inside the elastic modules 100 can also be adjacent to only four of the spring units 110, resulting in lower density of the spring units 110 and poorer resilience of the elastic module group 100 compared with this embodiment.

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tor 320 enables staggered arrangement of the spring units 110, each of spring units 110 is adjacent to six of the spring units 110 to form a hexagonal shape, and this arrangement achieves a densest arrangement of the spring units 110, thus imparting favorable support and resilience to the elastic module group. However, in this arrangement, multiple ones of the spring units 110 in the staggered arrangement can affect appearance regularity of the elastic modules 100 and the elastic module group and user experience, therefore, in this embodiment, the elastic modules 100 further comprise filling units 120, the filling units 120 are sleeved with the connecting seats 200, and connecting structures (not shown in drawings) are disposed on the connecting seats 200 sleeved on the filling units 120, the filling units 120 are interconnected to outer peripheral ones of the spring units 110 via the connecting structures to render the outer edges of the elastic modules 100 more regular. Specifically, cross-sections of the filling units 120 are elliptical, on a same horizontal plane, a major axis of the cross-section of the filling units 120 is equal to a diameter of cross-sections of the spring units 110, and a minor axis of the cross-sections of the filling units 120 is equal to a radius of the cross-sections of the spring units 110. In other possible implementations, a spring unit 110 inside the elastic modules 100 can also be adjacent to only four of the spring units 110, resulting in lower density of the spring units 110 and poorer resilience of the elastic module group 100 compared with this embodiment.

[0044] In summary, the elastic module group provided in the present disclosure implements detachable interconnection between the elastic modules via the connecting structures, featuring a simple structure and convenient operation, and disassembly and assembly of the elastic modules facilitate implementation of resizing of the elastic module group as well as partial replacement and cleaning of the elastic module group.

Embodiment 2

[0045] This embodiment differs from Embodiment 1 in that the structure of the second plug-in connector 320 and a connection method of the first plug-in connector 310 and the second plug-in connector 320 with the connecting groove are different.

[0046] As shown in FIG. 15, the body of the second plug-in connector 320 is an insertion piece 350, one end of the insertion piece 350 comprises the axle hole 330, and the insertion piece 350 is inserted into the side openings 211 such that the axle hole 330 is disposed at a side edge of the connecting groove 210. The first plug-in connector 310 is shown in FIG. 16, and a structure thereof is the same as that in Embodiment 1.

[0047] As shown in FIGS. 13 and 14, the first plug-in connector 310 and the second plug-in connector 320 are respectively inserted into two side openings 211 of

the connecting groove 210.

[0048] As shown in FIG. 17, when the elastic modules 100 are interconnected, two of the spring units 110 respectively disposed with the first plug-in connector 310 and the second plug-in connector 320 are opposed such that the first plug-in connector 310 and the second plug-in connector 320 on one of the spring units 110 are respectively aligned with the second plug-in connector 320 and the first plug-in connector 310 on another of the spring units 110, and then connected via the pin shaft 400 (not shown in drawings).

Embodiment 3

[0049] This embodiment differs from Embodiment 1 in that the structures of the first plug-in connector 310 and the second plug-in connector 320 are different.

[0050] As shown in FIGS. 18 and 19, the second plug-in connector 320 comprises an insertion piece 350 and the connecting post 340, a middle portion of the insertion piece 350 comprises a connecting post insertion hole 351, an end of the connecting post 340 comprises the axle hole 330, and another end of the connecting post 340 is fittingly inserted into the connecting post insertion hole 351. The insertion piece 350 is inserted into the side openings 211, the connecting post insertion hole 351 at least partially overlaps the outer wall opening 212, the connecting post 340 is sequentially inserted into the outer wall opening 212 and the connecting post insertion hole 351, and the axle hole 330 is located on a side wall of the connecting groove 210.

[0051] As shown in FIG. 20, the body of the first plug-in connector 310 comprises two parallel insertion pieces 350, first ends of the insertion pieces 350 are connected, and the axle holes 330 are formed at a connecting end of the two insertion pieces 350. The two insertion pieces 350 are respectively inserted into the side openings 211 of two adjacent ones of the connecting grooves 210, and the axle holes 330 are located at the side edges of the connecting grooves 210. When the second plug-in connector 320 is cooperatively connected to the first plug-in connector 310, the axle hole seat 330 of the second plug-in connector 320 is fitted between the two of the axle hole seats 330 of the first plug-in connector 310. The first plug-in connector 310 is not only cooperatively connected to the second plug-in connector 320 to connect two of the elastic modules, but the two insertion pieces 350 also respectively inserted into two adjacent ones of the spring units 110 for connection.

[0052] As shown in FIG. 21, the two insertion pieces 350 of the first plug-in connector 310 are respectively inserted into the side openings 211 of the two adjacent ones of the connecting grooves 210, and the axle holes 330 are located at the side edges of the connecting grooves 210 and between the two of the connecting grooves 210 connected therewith. One of the spring

units disposed with the second plug-in connector 310 and two of the spring units 110 disposed with the first plug-in connector 310 are arranged in a staggered manner to align the axle holes 330 of the first plug-in connector 310 and the second plug-in connector 320, thereby completing connection via the pin shaft 400 (not shown in drawings).

[0053] The preceding description is only preferred specific embodiments of the present disclosure, the implementation scope of the present disclosure is therefore not limited thereto, and equivalent variations and modifications shall still fall within the scope covered by the present disclosure provided they are made according to the scope and specification of the present disclosure.

INDUSTRIAL APPLICABILITY

[0054] The present disclosure discloses an interconnectable elastic module group and an elastic pad, the interconnectable elastic module group comprises at least two elastic modules that are detachably interconnected, an elastic module is constructed by a plurality of spring units arranged in an array, the elastic modules further comprise connecting seats sleeved on middle portions of the plurality of spring units, a connecting seat comprises four connecting structures on side surfaces of a spring unit, a connecting structure comprises a connecting groove, the connecting groove has an inner wall and an outer wall opposite to each other in a radial direction of the spring unit, the connecting groove has two opposite side edges in an axial direction of the spring unit, the two side edges and the outer wall of the connecting groove comprises openings. The spring units on an outer periphery of the spring modules comprise plug-in connectors inserted into the openings of the connecting grooves, and two adjacent ones of the elastic modules are connected via the plug-in connectors. The elastic modules are detachably interconnected via connecting structures, featuring a simple structure and convenient operation, disassembly and assembly of the elastic modules facilitate implementation of resizing of the elastic module group, as well as partial replacement and cleaning of the elastic module group, which has industrial applicability.

Claims

1. An interconnectable elastic module group, it comprises at least two elastic modules that are detachably interconnected, an elastic module is constructed by a plurality of spring units arranged in a matrix, **characterized in that**, the elastic modules further comprise connecting seats sleeved on middle portions of the plurality of spring units, a connecting seat comprises four connecting structures on side surfaces of a spring unit, a connecting structure comprises a connecting groove, the con-

necting groove has an inner wall and an outer wall opposite to each other in a radial direction of the spring unit, the connecting groove has two opposite side edges in an axial direction of the spring unit, the two side edges and the outer wall of the connecting groove comprises openings, the plurality of spring units are assembled into a spring module by inserting connecting buckles into the connecting grooves on sides of adjacent ones of the spring units; and

the spring units on an outer periphery of the spring modules comprise plug-in connectors inserted into the openings of the connecting grooves, and two adjacent ones of the elastic modules are connected via the plug-in connectors.

2. The elastic module group according to claim 1, **characterized in that**, a plug-in connector comprises bodies inserted into the connecting grooves and axle hole seats parallel to an elastic force direction of the spring unit, the axle hole seats of the adjacent ones of the spring units are not on a same horizontal plane, and axle holes at two different heights are aligned and connected by a pin shaft.

3. The elastic module group according to claim 2, **characterized in that**: the plug-in connector comprises a first plug-in connector, a second plug-in connector and the pin shaft that are cooperatively connected, an end of the first plug-in connector comprises the axle hole seats that are coaxially spaced, an end of the second plug-in connector comprises one of the axle hole seats, the first plug-in connector and the second plug-in connector are cooperatively connected, and the axle hole seat of the second plug-in connector is located between two of the axle hole seats of the first plug-in connector.

4. The elastic module group according to claim 3, **characterized in that**: a body of the first plug-in connector comprises two parallel insertion pieces, the two parallel insertion pieces are connected at one end, and the axle holes are formed at the one end where the two insertion pieces are connected; and
the two insertion pieces of the first plug-in connector are respectively inserted into the connecting grooves on the two adjacent ones of the spring units, and the axle holes are located at a side edge of the connecting grooves.

5. The elastic module group according to claim 3, **characterized in that**: a body of the first plug-in connector is an insertion piece, the axle holes are formed at one end of the insertion piece, the insertion piece is inserted into the openings on a side edge of the connecting groove, and the axle holes

are located at the side edge of the connecting groove.

6. The elastic module group according to claim 3, **characterized in that**: a body of the second plug-in connector is an insertion piece, the axle hole is formed at one end of the insertion piece, the insertion piece is inserted into the openings on a side edge of the connecting groove, and the axle hole is located at the side edge the connecting groove.

7. The elastic module group according to claim 3, **characterized in that**: a body of the second plug-in connector is a connecting post, an end of the connecting post comprises the axle hole, and another end of the connecting post is inserted into an opening on the outer wall of the connecting groove.

8. The elastic module group according to claim 3, **characterized in that**:

the second plug-in connector comprises an insertion piece and a connecting post, the axle hole seat is formed at an end of the connecting post, a middle portion of the insertion piece comprises a connecting post insertion hole, and another end of the connecting post is fittingly inserted into the connecting post insertion hole; and

the insertion piece is inserted into the openings on a side edge of the connecting groove, the connecting post insertion hole at least partially overlaps an opening on the outer wall of the connecting groove, and the connecting post is sequentially inserted into the opening on the outer wall and the connecting post insertion hole.

9. The elastic module group according to any of claims 3-8, **characterized in that**: a distance between the two of the axle holes of the first plug-in connector is equal to a length of the axle hole of the second plug-in connector in the elastic force direction, and
the first plug-in connector and the second plug-in connector are connected, and the axle hole of the second plug-in connector is fitted between the two of the axle holes of the first plug-in connector.

10. An elastic pad, **characterized in that**, it comprises the interconnectable elastic module group according to any of claims 1-9.

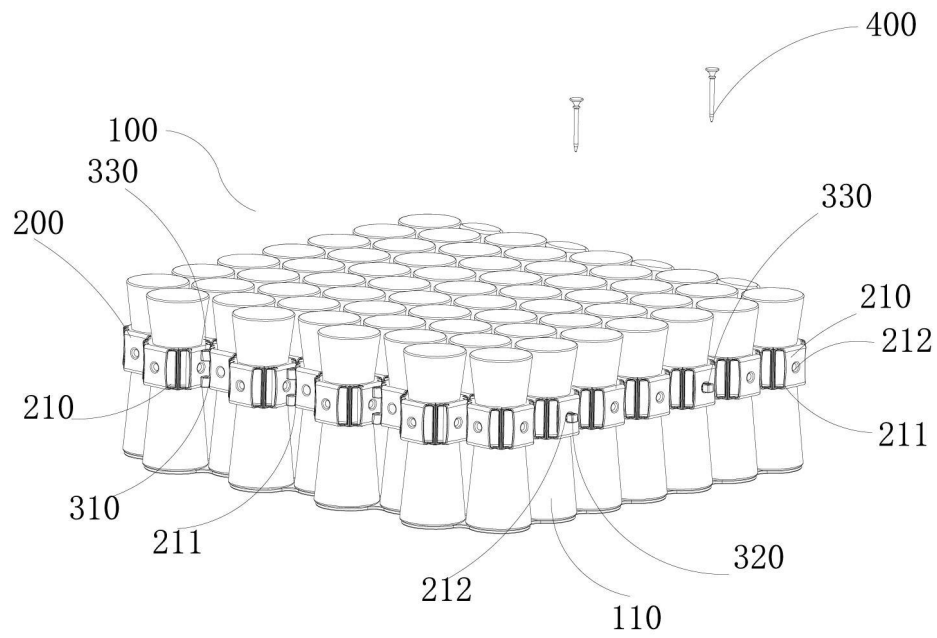


FIG. 1

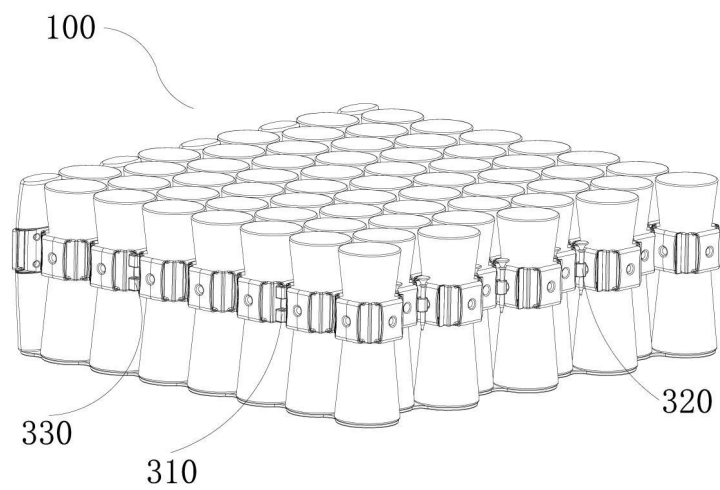


FIG. 2

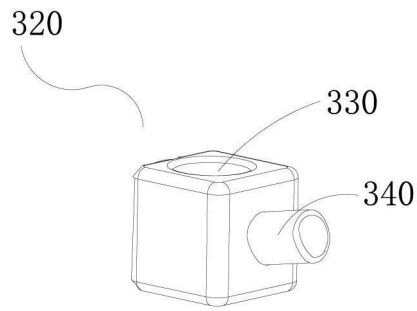


FIG. 3

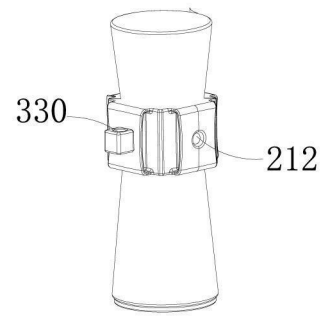


FIG. 4

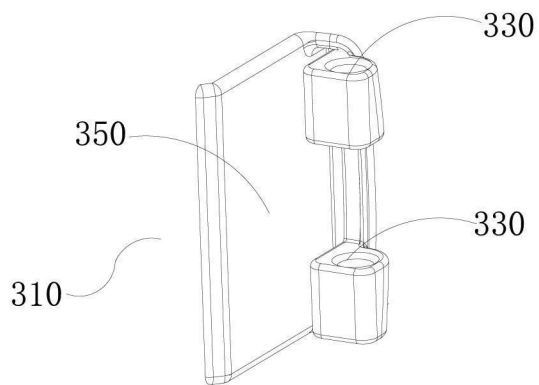


FIG. 5

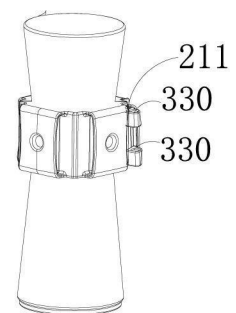


FIG. 6

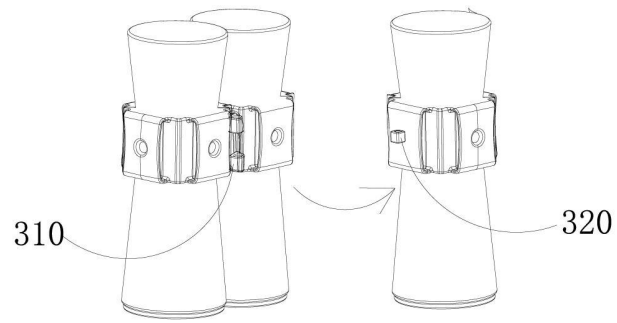


FIG. 7

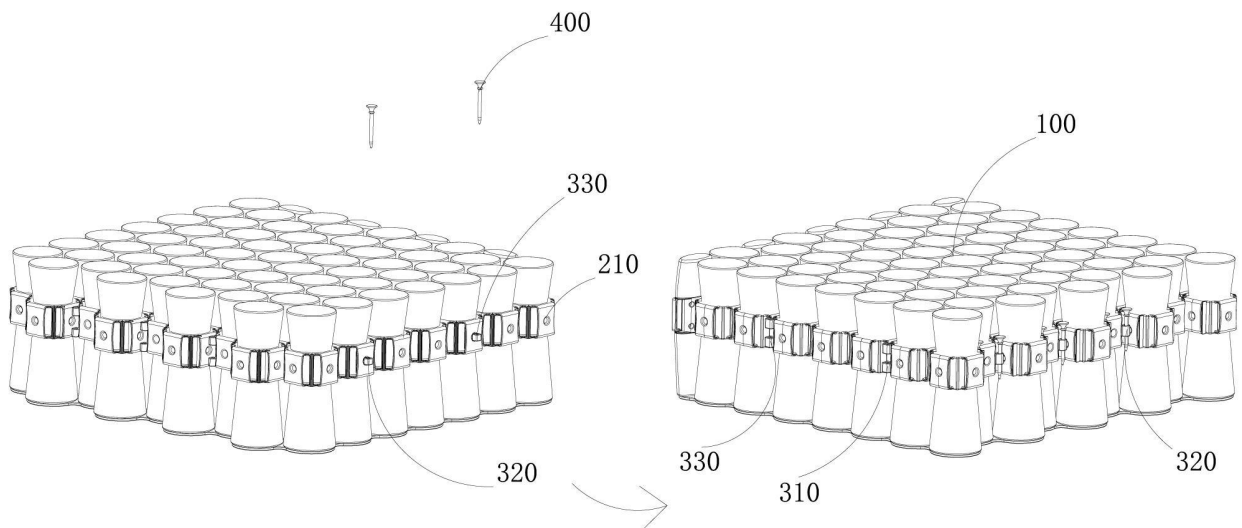


FIG. 8

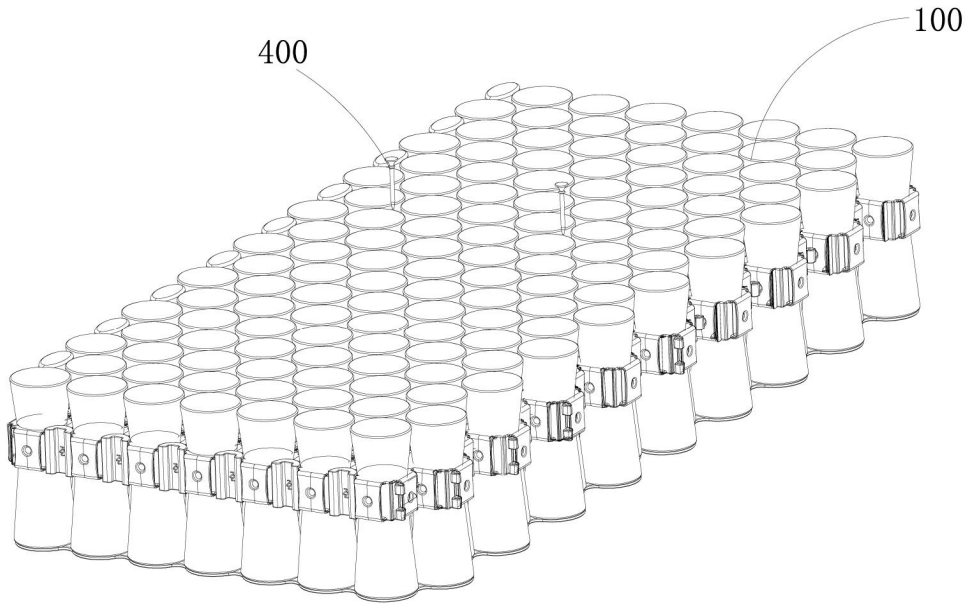


FIG. 9

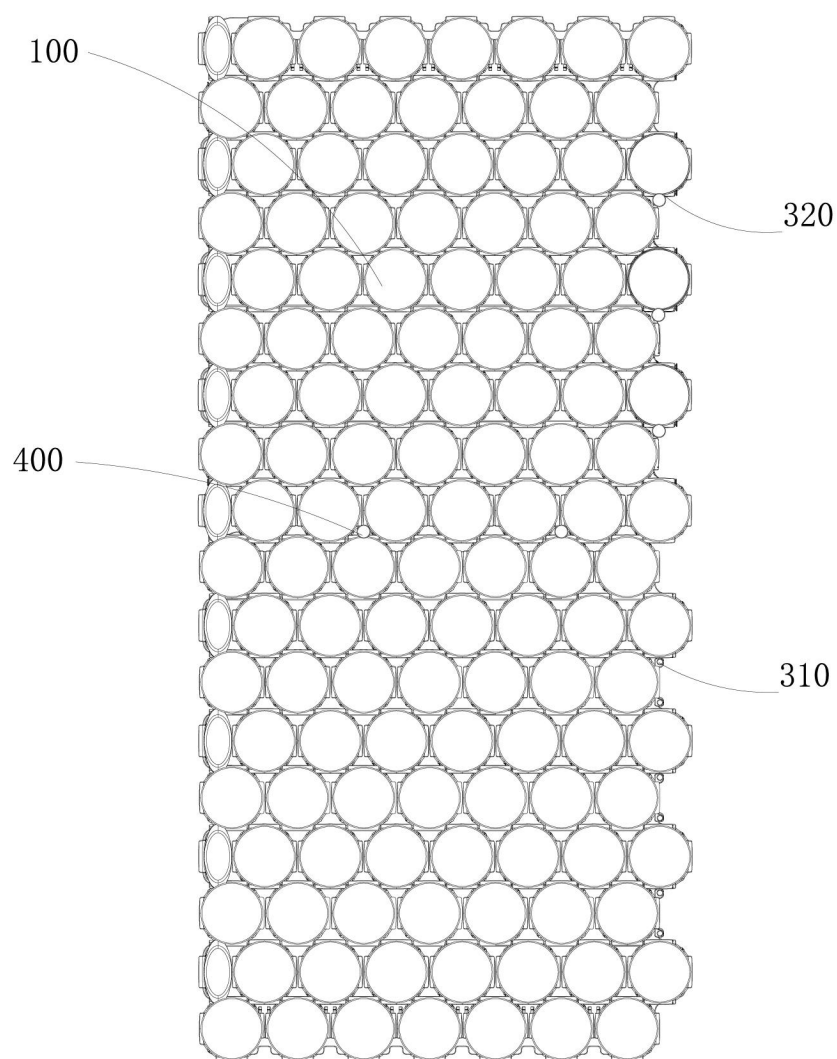


FIG. 10

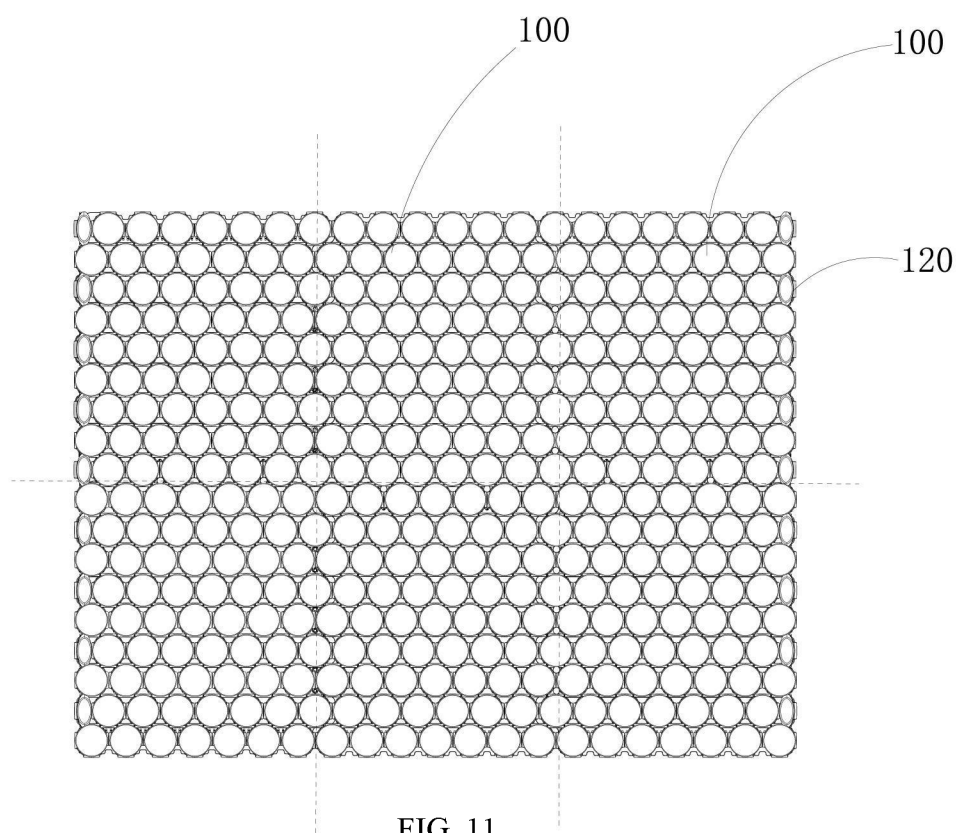


FIG. 11

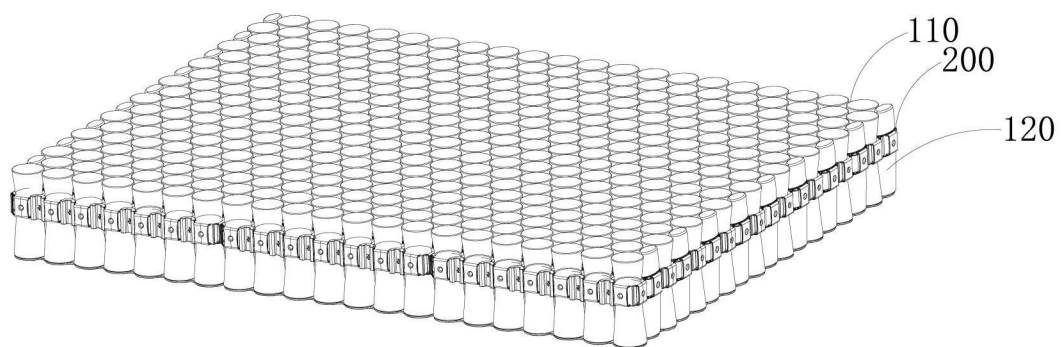


FIG. 12

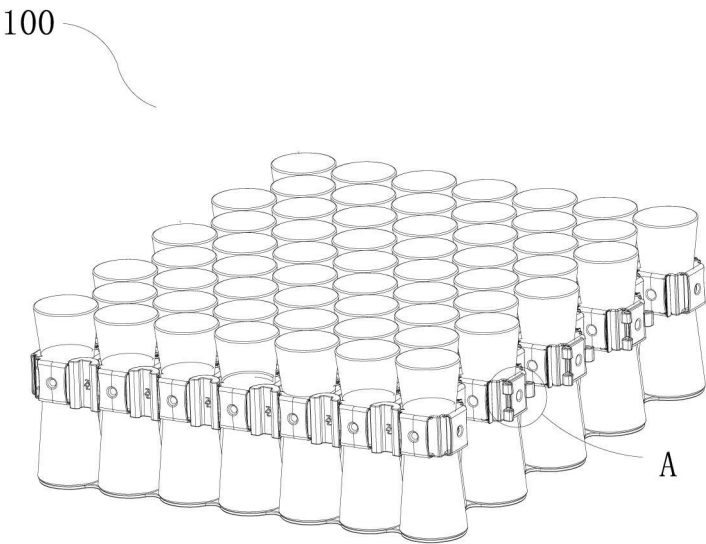


FIG. 13

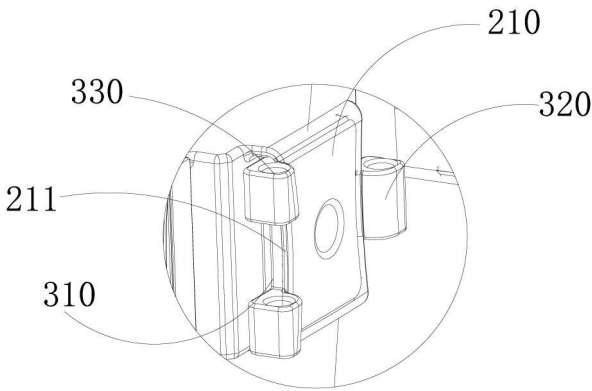


FIG. 14

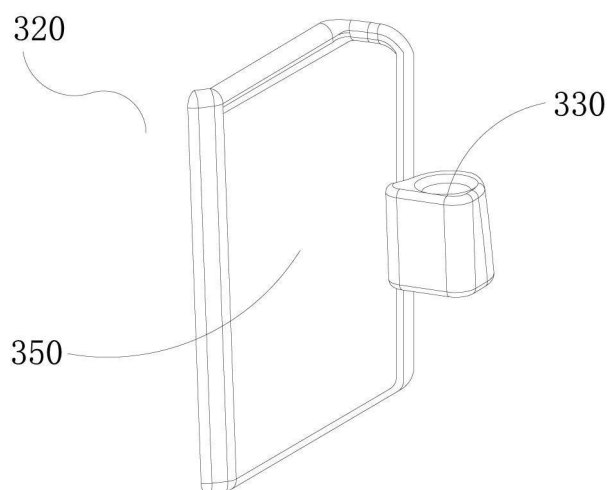


FIG. 15

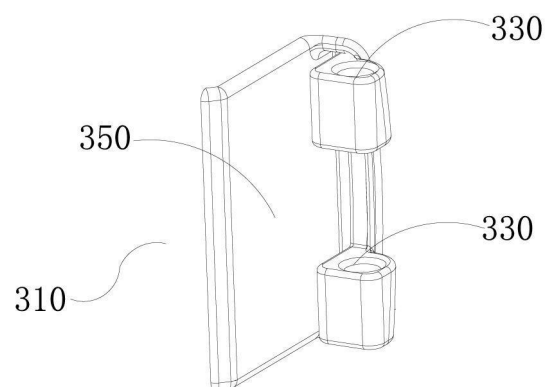


FIG. 16

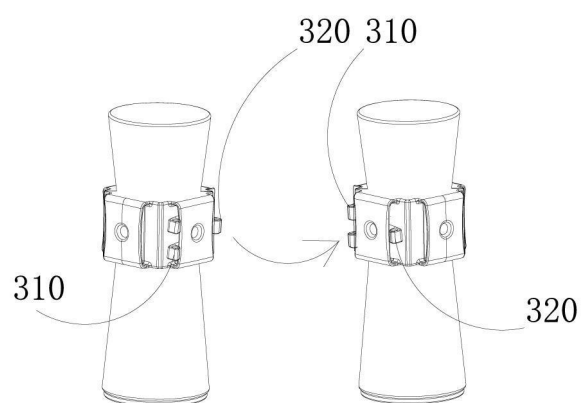


FIG. 17

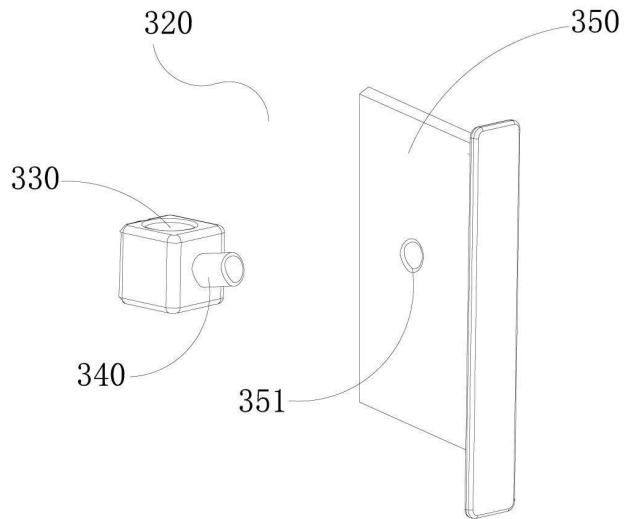


FIG. 18

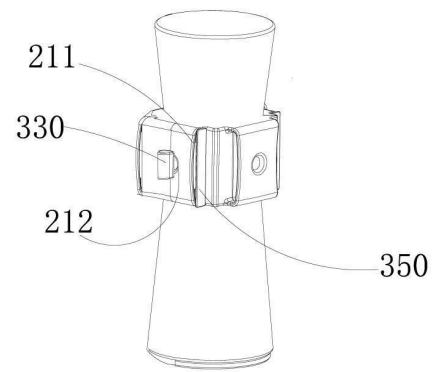


FIG. 19

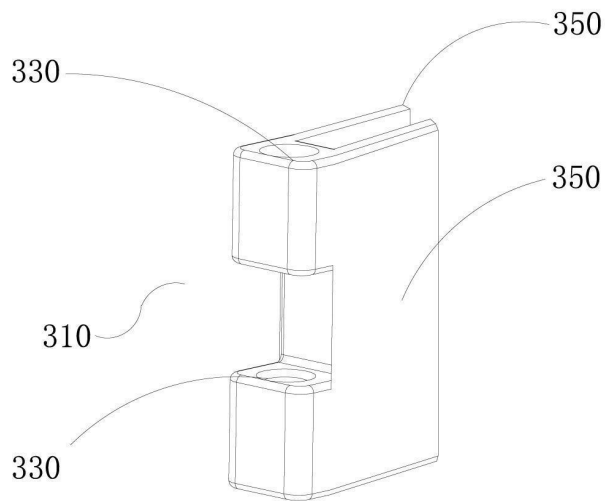


FIG. 20

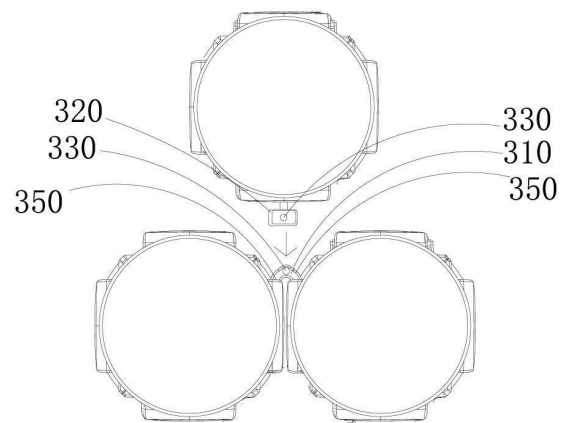


FIG. 21

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2024/139443

A. CLASSIFICATION OF SUBJECT MATTER

A47C27/06(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC:A47C,F16B

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

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

CNXTX; CNABS; WPABSC; ENTXTC; VEN; CNKI: 弹性垫, 弹簧, 弹性, 床, 床垫, 垫, 沙发, 连接, 拼接, 拼装, 卡接, 卡扣, 卡舌, 卡合, 扣接, 插接, 扣件, 中部, 腰部, 槽, 插件, 插口, 拆卸, 销轴, elastic pad, spring, elastic, bed, mattress, pad, sofa, connect, splice, erect, snap, tongue, plug, fastener, middle, waist, groove, insert, socket, detach, pin shaft

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 118167749 A (NEW TEC INTEGRATION XIAMEN CO., LTD.) 11 June 2024 (2024-06-11) description, paragraphs 0083-0106, and figures 1-55	1, 10
PY	CN 118167749 A (NEW TEC INTEGRATION XIAMEN CO., LTD.) 11 June 2024 (2024-06-11) description, paragraphs 0083-0106, and figures 1-55	2-9
PY	CN 221671314 U (NEW TEC INTEGRATION XIAMEN CO., LTD.) 10 September 2024 (2024-09-10) description, paragraphs 0004-0044, and figures 1-7	2-9
PX	CN 118188726 A (NEW TEC INTEGRATION XIAMEN CO., LTD.) 14 June 2024 (2024-06-14) description, paragraphs 0084-0105, and figures 1-30	1, 10
PX	CN 119055066 A (NEW TEC INTEGRATION XIAMEN CO., LTD.) 03 December 2024 (2024-12-03) description, paragraphs 0019-0023, and figures 4-7	1, 10

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

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"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"D" document cited by the applicant in the international application	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

28 March 2025

Date of mailing of the international search report

29 March 2025

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)
China No. 6, Xitucheng Road, Jimenqiao, Haidian District,
Beijing 100088

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2024/139443

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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A	CN 211902569 U (SHENZHEN JINGXINCHEN PHOTOELECTRIC TECHNOLOGY CO., LTD.) 10 November 2020 (2020-11-10) entire document	1-10
A	CN 218482324 U (SHENZHEN SUNWONDA INTELLIGENT TECHNOLOGY CO., LTD.) 14 February 2023 (2023-02-14) entire document	1-10
A	EP 1029473 A1 (AGRO FEDERKERNPROD GMBH) 23 August 2000 (2000-08-23) entire document	1-10
A	US 2018199728 A1 (LENG LUHAO) 19 July 2018 (2018-07-19) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2024/139443

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					EP	3462995	B1	28 July 2021	

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REFERENCES CITED IN THE DESCRIPTION

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