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

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

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

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(54) **ASSEMBLED SPRING MATTRESS**

(57) Provided in the present invention is an assembled spring mattress. The assembled spring mattress comprises a bed frame and a plurality of spring modules or several spring units, wherein each spring module consists of several spring units, and each spring unit is provided with a chamber for pairwise stacking and storage; the bed frame is formed by a plurality of sets of frames, comprising two sets of frames of different lengths, which are mutually inserted in pairs; the frames in the bed frame are configured to be able to release the insertion; positioning members are arranged between one of the two sets of frames of different lengths and the spring modules or the spring units, so as to form a detachable assembly; the frames are provided with at least one grid layer; and the grid layer is configured in such a way that a single grid thereof can be sleeved on at least one spring unit, and the frames are configured in such a way that the number of grids thereof is adapted to the modulus of the spring units of the spring modules, or the number of grids thereof is adapted to the modulus of spring units formed after stacking a plurality of spring units.

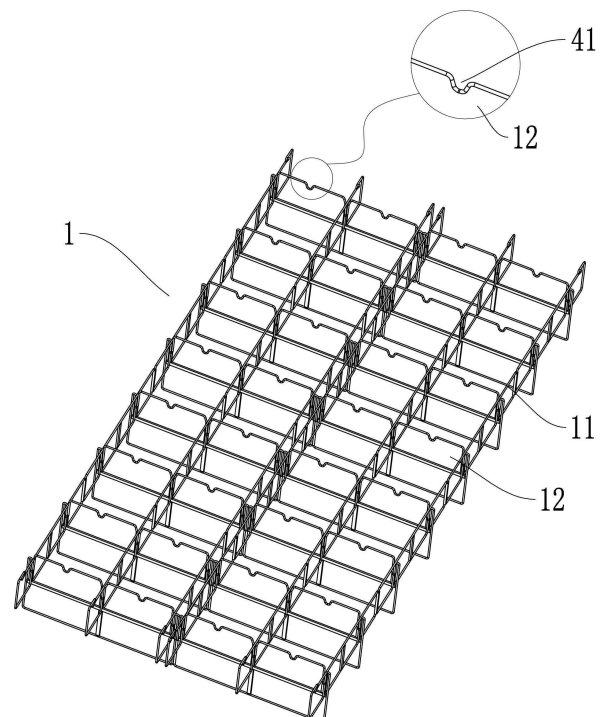


FIG. 1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202323425906.1, entitled "An assembled-type camping mattress", filed with the China National Intellectual Property Administration on December 14, 2023, and the content of the Chinese patent application is hereby incorporated herein by reference.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates to a mattress, and in particular relates to an easily assembled spring mattress.

BACKGROUND OF THE DISCLOSURE

[0003] With social development and the continuous improvement of people's living standards, material demands have been largely satisfied, while sleep quality has not improved correspondingly, how to achieve sound sleep has become a common concern, the comfort of mattresses has been enhanced, and springs in the mattresses provide excellent elasticity, however, conventional spring mattresses adopt an integral cushion having an integral structure with uniform elasticity, they cannot provide differentiated elasticity adapting to human body contours, and feature a complicated structure that disallows modular assembly, resulting in great inconvenience in transportation. The spring mattresses are also inapplicable for outdoor camping.

[0004] In camping scenarios, sleeping mats act as the mattresses, and the outdoor sleeping mats providing warmth, comfort and moisture resistance. Comfort is a critical factor for a pleasant outdoor night, even seemingly flat ground in outdoor conditions is uneven due to pebbles, stumps, and other protrusions, which can be hard and cause discomfort when sleeping directly on the ground, air mattresses are the most commonly used sleeping mats for inflatable performance and portability, nevertheless, the hardness and elasticity of the air mattresses are inferior to household spring mattresses, and the air mattress will sag according to the human body under load, preventing the human body from lying flat and relaxing fully.

BRIEF SUMMARY OF THE DISCLOSURE

[0005] The primary technical problem to be solved by the present disclosure is to provide an assembled-type spring mattress, which adopts mattress using springs as mattress modules for easy assembly and features independent elasticities of the springs while keeping interconnected.

[0006] To solve the above technical problems, the

present disclosure discloses an assembled-type spring mattress, which comprises a bed frame and a plurality of spring module groups or a plurality of spring units; and the bed frame is configured for assembling the spring module groups or the spring units;

A spring module group is constructed by the plurality of spring units, and the spring units comprise cavities for stacking and storage in pairs; the bed frame is formed by mutual insertion connection of multiple sets of frames with two different lengths in pairs; and the insertion connection between the frames of the bed frame is configured to be releasable;

Positioning members are disposed between one frame of the frames with two different lengths and the spring module groups or the spring units to form a detachable assembly; and

The frames comprise at least one grid layer; individual grids of the grid layer are configured to be sleeved on at least one of the spring units, and the frames are configured such that a number of the grids matches a modular quantity of the spring units of the spring module groups, or the number of the grids matches the modular quantity of the spring units formed by stacking the spring units.

[0007] In a preferred embodiment, the positioning members comprise grooves disposed on the one frame and protrusions disposed on bases of the spring module groups;

The one frame is assembled with one set of the spring module groups.

[0008] In a preferred embodiment, two ends of another frame of the frames with two different lengths are bent upward to form bent portions, and when the spring module groups fully cover the bed frame, bent ends of the bent portions abut the bases on outermost ones of the spring module groups.

[0009] In a preferred embodiment, a spring module group is constructed by a connecting base and the plurality of spring units disposed on the connecting base;

A long side of the connecting base is configured to have a rotatable half-folding structure; and the frames are configured to be sleeved on the spring module groups that are half-folded via the connecting base using one or more grid layers thereof.

[0010] In a preferred embodiment, the positioning members comprise a plurality of protrusions disposed on the one frame and grooves disposed on end faces of the spring units, and one of the protrusions is inserted into one of the grooves.

[0011] In a preferred embodiment, a spring unit comprises a spring fixing seat and a spring sleeve that are mutually buckled together, and the spring sleeve is configured to accommodate a tapered spring therein;

The spring sleeve comprises an inner cavity for stack-

ing another spring sleeve; and the spring fixing seat comprises a hole corresponding to the inner cavity for providing clearance for stacking another spring sleeve.

[0012] In a preferred embodiment, the grooves are disposed on end faces of the spring sleeves away from spring bases, and the end faces correspond to tapered tops of the tapered springs.

[0013] In a preferred embodiment, a plurality of connecting members are disposed at equal intervals along peripheral edges of the spring bases; and a connecting member comprises a buckling point and a buckling groove;

The plurality of spring units are configured such that the buckling point on one of the spring bases is buckled to the buckling groove on another one of the spring bases, and the spring bases form a supporting surface of the mattress via the buckled connection between the buckling points and the buckling grooves.

[0014] In a preferred embodiment, the connecting members comprise two protrusions between the buckling point and the buckling groove, one of the two protrusions comprises a recessed cavity for receiving another protrusion thereof;

Another protrusion on one of the spring bases is inserted into the recessed cavity of another one of the spring bases.

[0015] In a preferred embodiment, the positioning members comprise a plurality of protrusions disposed on the one frame and a plurality of grooves disposed on the end faces of the spring units in the spring module groups;

One of the protrusions is inserted into one of the grooves; and the one frame is assembled with one set of the spring module groups.

[0016] In a preferred embodiment, a spring module group is constructed by a connecting base and a plurality of spring units disposed on the connecting base; the grooves are disposed on the end faces of the spring units away from the connecting base;

After the spring module groups are assembled via the grooves and the protrusions, the connecting base is configured as the supporting surface of the mattress.

[0017] In a preferred embodiment, a long side of the connecting base is configured to have a rotatable half-folding structure, and the frames are configured to be sleeved on the spring module groups that are half-folded via the connecting base using one or more grid layers thereof.

[0018] In a preferred embodiment, the one frame is configured to be a short side of the bed frame, another frame of the frames with two different lengths is configured to be a long side of the bed frame.

[0019] In a preferred embodiment, the one frame comprises two or more of the at least one grid layers, and another frame comprises one or more grid layers; A grid-layer number of the one frame is greater than or equal to a grid-layer number of another frame.

[0020] In a preferred embodiment, the frames com-

prise a plurality of insertion grooves along a length direction thereof, the insertion grooves are disposed at intervals of a single one of the grids or two or more of the grids;

5 The frames with two different lengths form the bed frames by mutually inserting the insertion grooves.

[0021] In a preferred embodiment, a depth of the insertion grooves is set to at least 1/3 of a height of the grids of the frames on a short side, and a sum of the depths of the insertion grooves on the frames with two
10 different lengths equals the height of the grids.

[0022] In a preferred embodiment, the frames are configured to comprise at least one folding structure along a length direction thereof; the frames are folded
15 via the at least one folding structure such that the number of the grids thereof matches modular quantity of the spring units of the spring module groups, or the number of the grids thereof matches the modular quantity of the spring units formed by stacking the spring units.

20 **[0023]** In a preferred embodiment, a storage box is further comprised, the storage box comprises a box body and a box cover configured to be opened and closed relative to each other, and the box body is configured to storage the bed frame and the spring module groups.

25 **[0024]** The present disclosure further discloses an assembled-type spring mattress, which comprises spring units and bottom plates, the spring units comprise spring fixing seats or spring connecting bases, end covers and spring sleeves, the spring sleeves are connected between the end covers and the spring fixing seats or the spring connecting bases, the spring sleeves are configured to accommodate springs there-
30 in, multiple ones of the spring units are disposed in an aligned arrangement or a staggered arrangement, positioning members are disposed on end faces of the spring units and the bottom plates, and the spring units are connected to the bottom plates via fixing members.

35 **[0025]** The end faces are the spring fixing seats or the spring bases or the spring end covers, positioning members comprise grooves disposed on end faces of the springs and corresponding protrusions disposed on the bottom plates. Preferably, the bottom plates form a bed frame, the frame is formed by mutually inserting a plurality of crisscross frames; and steel wires of the frames are bent upward to form the protrusions config-
40 ured to have a positioning fit with the grooves on the end covers of the spring units, and the spring units are fixed on the frames.

50 **[0026]** Compared with the existing techniques, the technical solution of the present disclosure has the following advantages:

55 1. The present disclosure divide the spring mattress into the bed frame and the spring module groups, which can be assembled together when in use with simple operation, the mattress using springs as mattress modules is applicable for

camping and delivers improved comfort of the spring mattress.

2. In the present disclosure, the bed frame can be disassembled and assembled, the spring units inside the spring module groups are assembled and disassembled relative to each other and can be stacked for storage after disassembly, which can be folded and stored in a storage box when not in use, achieving effective space saving and easy portability.

3. The springs in the present disclosure can be easily mounted on the bottom plates or the bed frame via the positioning members, the springs provide independent elastic support, and upper ends of the springs can be connected or disconnected, the upper ends of the springs need not to form a rigid integral structure, which is suitable for camping and can also be used as household mattresses, sofas and other furniture.

BRIEF DESCRIPTION OF THE DRAWING

[0027]

FIG. 1 is a schematic view of an assembled bed frame of Embodiment 1 of the present disclosure in use;

FIG. 2 is a structural schematic view of a frame forming a short side of the bed frame of Embodiment 1;

FIG. 3 is a schematic view showing folding steps of the frame forming the short side of the bed frame of Embodiment 1;

FIG. 4 is a structural schematic view of a frame forming a long side of the bed frame of Embodiment 1;

FIG. 5 is a schematic view showing folding steps of the frame forming the long side of the bed frame of Embodiment 1;

FIG. 6 is a schematic view showing assembly of the bed frame and a spring module group of Embodiment 1;

FIG. 7 is a cross-sectional view showing a matching connection between the bed frame and the spring module group of Embodiment 1;

FIG. 8 is a schematic view of multiple spring module groups assembled on the bed frame of Embodiment 1;

FIG. 9 is an overall structural view of a camping bed composed of the bed frame and the spring module groups of Embodiment 1;

FIGS. 10 and 11 are schematic views showing folding and storage of the frame forming the long side of the bed frame of Embodiment 1;

FIG. 12 is a schematic view showing folding and storage of the frame forming the short side of the bed frame of Embodiment 1;

FIG. 13 is a schematic view of the bed frame and

the spring module groups fully folded and stored in a storage box of Embodiment 1;

FIG. 14 is a schematic view of an assembled bed frame of Embodiment 2 in use;

FIG. 15 is a schematic view showing insertion connection between the bed frame and a single spring unit of Embodiment 2;

FIG. 16 is a schematic view of the single spring unit inserted onto the bed frame of Embodiment 2;

FIG. 17 is a schematic view of multiple spring units inserted onto the bed frame of Embodiment 2;

FIG. 18 is a structural schematic view of a single spring unit of Embodiment 4;

FIG. 19 is a schematic view showing a connection of two spring units via connecting members of Embodiment 4;

FIG. 20 is a schematic view of the connection of the two spring units of Embodiment 4;

FIG. 21 is a cross-sectional view showing the connection via the connecting members of Embodiment 4;

FIG. 22 is a schematic view showing a connection between a spring mattress and a soft cushion layer of Embodiment 4;

FIG. 23 is a schematic view of a spring module group assembled by the multiple spring units of Embodiment 4;

FIG. 24 is an exploded view of a spring mattress and a soft cushion layer of Embodiment 5;

FIG. 25 is a schematic view of an assembled bed frame of Embodiment 5 in use; and

FIG. 26 is a schematic view showing folding and storage of the bed frame of Embodiment 5.

[0028] Reference numerals in drawings: bed frame 1; Long frame 11; short frame 12; folding structure 13; grid layer 14; bent portion 15; insertion groove 16; bottom plate 17; grid structure 18; spring module group 2; connecting base 21; spring unit 3; spring fixing seat 31; spring sleeve 32; tapered spring 33; connecting member 34; buckling point 341; buckling groove 342; protrusion 343; recessed cavity 344; elastic piece 345; buckling block 346; buckling hole 347; positioning member 4; groove 41; protrusion 42; storage box 5; spring mattress 6; soft cushion layer 7; pull buckle strap 71.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0029] The technical solutions in the embodiments of the present disclosure will be described clearly and completely in conjunction with the accompanying drawings in the embodiments of the present disclosure; and it is obvious that the described embodiments are only some of the embodiments of the present disclosure, rather than all embodiments, and 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.

[0030] In the description of the present disclosure, terms such as "upper", "lower", "inner", "outer", "top/-bottom" indicate orientations or positional relationships based on the orientations or positional relationships shown in the accompanying drawings, which are merely for convenience of describing the present disclosure and simplifying the description, and do not indicate or imply that the referred devices or elements should have a specific orientation, be constructed and operated in a specific orientation, and thus shall not be construed as limitations to the present disclosure. In addition, the terms "first" and "second" are only used for description and shall not be understood as indicating or implying relative importance.

[0031] In the description of the present disclosure, unless otherwise clearly specified and limited, the terms "mount", "arrange", "sleeve", "connect" and the like shall be construed broadly, for example, "connect" can be wall-mounted connection, detachable connection, integral connection, mechanical connection, electrical connection, direct connection, indirect connection via intermedium, or internal communication between two components. The specific meanings of the terms in the present disclosure can be understood according to actual circumstances by a person of ordinary skill in the art.

[0032] Referring to FIGS. 1-17, this embodiment provides an assembled-type spring mattress 6, which comprises a bed frame 1 and a plurality of spring module groups 2 or a plurality of spring units 3, the plurality of spring module groups 2 or the plurality of spring units 3 are detachably assembled on the bed frame 1, the disassembled spring module groups 2 can be folded and stacked together or the plurality of spring units 3 can be stacked together, which greatly reduces storage space, in this embodiment, a spring module group 2 is composed of the plurality of spring units 3.

[0033] The bed frame 1 in this embodiment is formed by mutually inserting multiple sets of frames with two different lengths in pairs, wherein one frame thereof constitutes exactly a long side of the bed frame 1, another frame thereof constitutes a short side of the bed frame, array in the long side and array in the short side, the frames on the long side and the frames on the short side are arranged in rows and columns and mutually inserted to form a stable supporting structure of the bed frame 1, the insertion connection between the frames is configured to be structures with a mutually releasable insertion connection to facilitate assembly and disassembly of the bed frame 1, when not in use, the bed frame 1 can be disassembled into individual ones of the frames for storage, specifically, positioning members 4 are disposed between the one frame of the frames with the two different lengths and the spring module groups 2 or the spring units 3 to realize detachable assembly.

[0034] To further reduce a storage volume of the

frames, in this embodiment, the frames are configured to comprise at least one folding structure 13 along a length direction thereof for folding and storage, the folding structure 13 is designed according to spring modular quantity, so that the frames after folding and storage can be exactly sleeved on the spring units 3 that are stacked and stored. Specifically, the frames comprise at least one grid layer 14; and individual grids of the grid layer 14 can be sleeved on at least one of the spring units 3, the frames are folded via the folding structure 13 such that the number of the grids thereof matches a modular quantity of the spring units 3 of the spring module groups 2, or the number of the grids thereof matches the modular quantity of the spring units 3 formed by stacking the spring units 3.

[0035] For the grid layer 14 of the frames: the one frame comprises two or more of the grid layer 14; another frame comprises one or more of the grid layer 14; the number of the grid layer 14 of the one frame is greater than or equal to the number of the grid layer 14 of another frame.

[0036] In this embodiment, for carrying convenience and applicable to camping, the spring mattress 6 further comprises a storage box 5, the storage box 5 comprises a box body and a box cover that are configured to be opened and closed relative to each other, and the box body is used for storing the bed frame 1 and the spring module groups 2 that are disassembled.

Embodiment 1 (As shown in FIG. 1-12)

[0037] In Embodiment 1, the bed frame 1 is disassembled into long frames 11 and short frames 12, the long frames 11 are arranged in a vertical direction and the short frames 12 are arranged in a horizontal direction, and the long frames 11 and the short frames 12 are mutually inserted, insertion structures are insertion grooves 16 formed on both the long frames 11 and the short frames 12, the insertion grooves 16 are spaced apart by a single one of grids or two or more of the grids on the frames, the depth of the insertion grooves 16 is set to at least 1/3 of the height of the grids of the frames on the short side. The long frames 11 and the short frames 12 are mutually inserted via the insertion grooves 16 to form the bed frame 1, and the sum of the depths of the matched insertion grooves 16 on the short frames and the long frames equals the height of the grids.

[0038] Specifically, along the insertion direction, the insertion grooves 16 on the long frames 11 are disposed on a lower half of individual ones of the grids, and the insertion grooves 16 on the short frames 12 are disposed on an upper half of individual ones of the grids, when the long frames 11 are inserted downward into the short frames 12, corresponding ones of the insertion grooves 16 on the lower half match parts of the short frames 12 without the insertion grooves 16, and the insertion grooves 16 of the short frames 12 on

the upper half exactly inserted onto parts of the long frames 11 without the insertion grooves 16, and the insertion grooves 16 have an insertion fit with the parts without the insertion grooves 16, thus enabling the bed frame to form a stable connection during insertion assembly and ensuring the stability of the bed frame 1 during use.

[0039] In Embodiment 1, the bed frame 1 is assembled with the spring module groups 2, a spring module group 2 is constructed by a connecting base 21 and a plurality of spring units 3 disposed on the connecting base 21. The positioning members 4 comprise grooves 41 disposed on the short frames 12 and protrusions 42 disposed on the connecting bases 21 of the spring module groups 2, and one of the short frames 12 is assembled with one of the spring module groups 2.

[0040] Specifically, spacing between pairs of the grooves 41 on the short frames 12 is equal to a width of bases of individual ones of the spring units 3 on the spring module groups 2, the protrusions 42 are disposed at a bottom of lowing abutting sides of two adjacent ones of the spring units 3 on the spring module groups 2, the spring module groups 2 are fixed on the bed frame 1 by engagement between the grooves 41 and the protrusions 42, adjacent ones of the grooves 41 are correspondingly buckled to one of the spring units 3, which ensure stable positions of individual ones of the spring units 3 and prevent displacement when the formed mattress bears load, in this embodiment, the spring module groups 2 are limited by the grooves 41 and the protrusions 42 in the horizontal direction and in the vertical direction.

[0041] Further, in order to perform a limitation for the spring module groups 2 in the vertical direction, the limitation is configured such that bent portions 15 are disposed on two ends of the long frames 11, when the spring module groups 2 fully cover the bed frame 1, bent ends of the bent portions 15 abut bases on outermost ones of the spring module groups 2, the bent portions 15 disposed on the two ends of the long frames 11 not only limit the spring module groups 2 after assembly to prevent displacement of the spring module groups 2 during use, but also simplify the limitation for the spring module groups 2 in the vertical direction, thus providing clearance for assembly of the spring module groups 2 via the grooves 41 and the protrusions 42 in the horizontal direction, and avoiding reductions in assembly efficiency resulting from complicated limiting structures on the long frames 11.

[0042] In Embodiment 1, a structure for folding and storing the spring module groups 2, the long frames 11, and the short frames 12 is configured as follows, in the spring module group 2, and a long side of the connecting base 21 is configured to have a rotatable half-folding structure.

[0043] Specifically, the connecting base 21 comprises a first base and a second base, a side of an end

of the first base and the second base form a rotatable hinged connection, first buckling members for mutual engagement are disposed on a side opposite to the hinged connection of the end of the first base and the second base disposed with the hinged connection; side edges of the first base and the second base forming an assembled connection through rotation and side edges separated from each other through the rotation are disposed with second buckling members configured for mutual opposite connection; and the connecting base 21 is configured using the pivoted connection such that the first base and the second base are configured to be releasably engaged with each other through the second buckling members on the side edges for the assembled connection; or the connecting base 21 is configured using the pivoted connection such that the first base and the second base are configured to be releasably buckled through the first buckling members on the end for the rotation.

[0044] When the first base and the second base are buckled by the first buckling members at the end for the rotation, the spring module groups 2 for assembling on the bed frame 1 are formed, when the first base and the second base are buckled by the second buckling members on the side edges for the assembled connection, the spring module groups 2 for folding for storage are formed. In this embodiment, the first base and the second base are respectively disposed with four of the spring units 3, and tapered ends of tapered springs 33 of the spring units 3 face upward.

[0045] In Embodiment 1, the folding structure 13 of the long frames 11 and short frames 12 that are disassembled adopt hinge structures, after being folded via the folding structure 13, the frames can be sleeved on the spring module groups 2 half-folded via the connecting bases 21, it should be noted that the folding structure 13 is not limited to the hinge structures mentioned in this embodiment, and the folding structure 13 formed by other folding structures 13, such as hinge structures and pin-type folding structures, are equivalent replacements of the hinge structures of this embodiment.

[0046] Specifically, the short frames 12 comprise upper and lower layers of the grid layer 14 corresponding to the two layers of the spring units 3 on the first base and the second base that are half-folded, sizes of individual ones of the grids can be sleeved on two of the spring units 3, the connecting base 21 corresponds to the short frames 12 to be folded once, and a folded short frame 12 has two of the grids on each of the upper and lower layers to correspondingly sleeve the four of the spring units 3 corresponding to the first base and the second base for storage.

[0047] The long frame 11 comprises one layer of the grid layer 14, and individual ones of the grids are correspondingly sleeved on individual ones of the spring units 3, which are folded twice along a length thereof corresponding to the four of the spring units 3 on the first base and the second base that are half-folded, so

as to be folded to be correspondingly sleeved on the four of the spring units 3 on the first base and the second base for storage.

[0048] Different designs of the grids and different folding times of the long frames 11 and the short frames 12 are optimized for space after folding for storage, after the long frames 11 and the short frames 12 after folding for storage are sleeved on the spring units 3, a stacking height of all the frames after stacking exactly matches a height of the spring units under an initial preload, the frames are perfectly combined with the spring units during storage, so that an occupied space for storage is only that of the spring module groups 2 that are folded, which is convenient for storage of the storage box 5 and makes full use of a vertical space of the spring units.

[0049] Regarding a number design of the grid layer 14 on the long frames 11 and the short frames 12, besides optimizing space utilization during storage, two or more layers of the short frames 12 can be adopted where space permits, so as to increase a supporting height of the bed frame 1 in use.

[0050] In Embodiment 1, as shown in FIG. 9, the spring mattress 6 assembled by the bed frame 1 and the spring module groups 2 can be used directly after laying a bed sheet or a cover on the mattress, the spring mattress 6 delivers softness and comfort of household mattresses and realizes an application of the mattress using the spring as mattress modules in camping scenarios, thus improving comfort of the spring mattress 6 and delivering convenient use of the spring mattress 6, it can be folded and stored in the storage box 5 when not in use (as shown in FIGS. 10-13), which saves space and is easy to carry.

Embodiment 2 (As shown in FIG. 14-17)

[0051] Based on a structural design of the bed frame 1 in Embodiment 1, it differs from Embodiment 1 in that a design of an assembled structure between the bed frame 1 formed by the frames and the spring module groups 2 or the spring units 3.

[0052] In Embodiment 2, the bed frame 1 is assembled with the spring units 3, a spring unit 3 comprises a spring fixing seat 31 and a spring sleeve 32 that are mutually buckled together, as well as spring end covers 5, and the spring sleeve 32 is configured to accommodate a tapered spring 33 therein; and the spring sleeve 32 comprises an inner cavity for stacking another spring sleeve 32, and the spring fixing seat 31 comprises a hole corresponding to the inner cavity for providing clearance for stacking another spring sleeve.

[0053] The positioning members 4 comprise multiple ones of the protrusions 42 disposed on the short frames 12 and the grooves 41 disposed on the end covers 5 of the spring units 3, and one of the protrusions 42 is inserted into one of the grooves 41.

[0054] Specifically, the grooves 41 are disposed on

the end covers 5 of the spring sleeves 32 away from spring bases; and the end covers 5 are disposed at tapered tops of the tapered springs 33, a supporting area of the spring mattress 6 assembled by the spring units 3 is formed by an orientation of the spring bases of the spring unit 3, an inverted structure of the spring units 3 mainly enlarges support of the spring mattress 6 for outdoor use, this facilitates assembly of the spring units 3 and improves usability of the spring mattress 6, the orientation of the spring bases forms the supporting area, and a thin camping mat can be laid directly on the supporting surface to form the mattress for use with the large supporting area and better stability of the mattress.

[0055] To enhance the stable connection between individual ones of the spring bases in the supporting surface during inverted placement, the spring bases provided in Embodiment 2 are fitted with a plurality of connecting members 34 disposed at equal intervals along peripheral edges thereof, the connecting members 34 connect the spring bases in pairs, preventing unstable shaking of the spring units 3 featuring a wider top and a narrower bottom when inverted under load, and improving the connection stability between the spring units 3 in pairs. For the spring mattress with a spring height of less than 15 cm, or with relatively large spring diameters, e.g., no less than 5 or 6 cm, the connecting members 34 may be omitted, in such cases, individual ones of the springs can be fixed to a base plate or the bed frame via the positioning members, and a shape of the springs is preferably a waisted shape, namely, diameters at both ends of the springs are larger than a diameter at a waist portion.

[0056] A specific structure of the connecting members 34 is as follows, a connecting member 34 comprises a buckling point 341 and a buckling groove 342; and the plurality of spring units 3 are connected such that the buckling point 341 on one of the spring bases engages with the buckling groove 342 on another one of the spring bases, and the spring bases form the supporting surface of the mattress via the engagement between the buckling points 341 and the buckling grooves 342.

[0057] Meanwhile, to further improve stability when acting as the supporting surface, the connecting members 34 comprise two protrusions 343 between the buckling point 341 and the buckling groove 342, one of the two protrusions 343 comprises a recessed cavity 344 for receiving another one of the protrusions 343; and another one of the protrusions 343 on one of the spring bases is inserted into the recessed cavity 344 of another one of the spring bases.

Embodiment 3

[0058] Based on Embodiment 2, an assembly of individual ones of the spring units 3 can be replaced with an assembly of the spring module groups 2, the posi-

tioning members 4 comprise a plurality of protrusions 42 disposed on the short frames 12 and a plurality of grooves 41 disposed on end faces of the spring units 3 inside the spring module groups 2, and one of the protrusions 42 is inserted into one of the grooves 41; and one set of the short frames 12 is assembled with one set of the spring module groups 2.

[0059] Specifically, a spring module groups 2 is constructed by the connecting base 21 and the plurality of spring units 3 disposed on the connecting base 21; the grooves 41 are disposed on the end faces of the spring units 3 away from the connecting base 21; and after the spring module groups 2 are assembled via the grooves 41 and the protrusions 42, the connecting base 21 is configured as the supporting surface of the mattress. Compared with the assembly of the spring units 3, the assembly of the spring module groups 2 reduces assembly steps and time, which is more suitable for camping scenarios.

[0060] Similarly, in Embodiment 3, a long side of the connecting base 21 is configured to have a rotatable half-folding structure; and the frames folded via the folding structures 13 can be sleeved on the spring module groups 2 that are half-folded via the connecting bases 21 for storage and carrying.

Embodiment 4 (As shown in FIG. 18-23)

[0061] Based on Embodiment 2, the assembling structure between the spring module groups 2 or the spring units 3 and the bed frame 1 on is provided.

[0062] To enhance the stable connection between individual ones of the spring bases on the supporting surface during inverted placement, the spring bases provided in Embodiment 4 are fitted with a plurality of connecting members 34 disposed at equal intervals along peripheral edges thereof, the connecting members 34 connect the spring bases in pairs, preventing unstable shaking of the spring units 3 featuring a wider top and a narrower bottom when inverted under load, and improving the connection stability between the spring units 3 in pairs.

[0063] A specific design of the connecting members 34 is as follows, a connecting member comprises an elastic piece 345 with a buckling block 346 and a buckling hole 347, the spring units 3 are configured such that the buckling block 346 of one of the spring bases is buckled to the buckling hole 347 of another of the spring bases, and the spring bases are configured to form the supporting surface of the mattress via a buckled connection of the buckling block 346 and the buckling hole 347.

[0064] Meanwhile, to further improve stability when acting as the supporting surface, the connecting members 34 comprise two protrusions 343 between the buckling block 346 and the buckling hole 347, one of the two protrusions 343 comprises a recessed cavity 344 for receiving another one of the protrusions 343;

and another one of the protrusions 343 on one of the spring bases is inserted into the recessed cavity 344 of another one of the spring bases.

[0065] Embodiment 4 further provides a soft cushion layer 7 configured to be laid on the spring mattress 6, and a plurality of pull buckle straps 71 are disposed on peripheral edges of the soft cushion layer 7; and the pull buckle straps 71 are detachably connected with the connecting members 34 on the spring units 3, the spring units 3 are positioned at an outer periphery of the spring mattress 6, and the soft cushion layer 7 is laid on the spring mattress 6 in a semi-wrapped form.

[0066] In Embodiment 4, a structure of the pull buckle straps corresponding to the soft cushion layer 7 to form a detachable connection with the connecting members 34 is consistent with the structure of the connecting members 34 on the spring units 3 to form a matched buckling structure.

Embodiment 5 (As shown in FIG. 24-26)

[0067] Embodiment 5 provides a structure of the bed frame 1, which is formed by assembling multiple identical frames in pairs, the frames are configured to be bottom plates 17 with grid structures 18, and the grid structures 18 are configured such that individual grids can be sleeved on individual ones of the spring units 3.

[0068] The bottom plates 17 comprise assembling structures, and the bottom plates 17 can be assembled in pairs via the assembling structures or assembled to third members via the assembling structures, the bottom plates 17 are detachable and can be stacked in pairs for folding and storage to reduce storage volume of the frames, in this embodiment, the camping mattress also comprises a storage box, the storage box comprises a box body and a box cover that are configured to be opened and closed relative to each other, the box body is configured for storing the bottom plates 17 and the spring units 3 that are disassembled, which is applicable for camping and is convenient for carrying.

[0069] In Embodiment 5, the spring mattress 6 is assembled using structures of the spring units 3 of Embodiment 4. The positioning structures comprise the protrusions 42 disposed on the bottom plates 17 and the grooves 41 disposed on the end faces of the spring units 3, and one of the protrusions 42 is inserted into a corresponding one of the grooves 41. The assembled structure is the same as the assembled structure between the bed frame 1 formed by the frames and the spring module groups 2 or the spring units 3 described in Embodiment 2.

[0070] Specifically, in Embodiment 5, the protrusions 42 and the grooves 41 are the tapered protrusions 42 and the tapered grooves 41, when the spring module groups 2 or the spring units 3 are under pressure, a downward cooperation of tapered structures forms tapered interference fit which tightens under load, so that the insertion connection is more stable.

[0071] The preceding description is only preferred embodiments of the present disclosure, the design and the concept of the present disclosure is not limited thereto, and any insubstantial modifications of the present disclosure shall fall within the protection scope of the present disclosure provided that they are made by those of skill in the art within the technical scope disclosed by the present disclosure based on the concept.

INDUSTRIAL APPLICABILITY

[0072] The present disclosure discloses an assembled-type spring mattress, which comprises a bed frame and a plurality of spring module groups or a plurality of spring units; a spring module group is constructed by the plurality of spring units, and the spring units comprise cavities for stacking and storage in pairs; the bed frame is formed by mutual insertion connection of multiple sets of frames with two different lengths in pairs; and the insertion connection between the frames of the bed frame is configured to be releasable; positioning members are disposed between one frame of the frames with two different lengths and the spring module groups or the spring units to form a detachable assembly; and the frames comprise at least one grid layer; individual grids of the grid layer are configured to be sleeved on at least one of the spring units, and the frames are configured such that a number of the grids matches a modular quantity of the spring units of the spring module groups, or the number of the grids matches the modular quantity of the spring units formed by stacking the spring units, which has industrial applicability.

Claims

1. An assembled-type spring mattress, **characterized in that:** which comprises a bed frame and a plurality of spring module groups or a plurality of spring units; and the bed frame is configured for assembling the spring module groups or the spring units;

a spring module group is constructed by the plurality of spring units, and the spring units comprise cavities for stacking and storage in pairs; the bed frame is formed by mutual insertion connection of multiple sets of frames with two different lengths in pairs; and the insertion connection between the frames of the bed frame is configured to be releasable; positioning members are disposed between one frame of the frames with two different lengths and the spring module groups or the spring units to form a detachable assembly; and the frames comprise at least one grid layer;

individual grids of the grid layer are configured to be sleeved on at least one of the spring units, and the frames are configured such that a number of the grids matches a modular quantity of the spring units of the spring module groups, or the number of the grids matches the modular quantity of the spring units formed by stacking the spring units.

2. The assembled-type spring mattress according to claim 1, **characterized in that:** the positioning members comprise grooves disposed on the one frame and protrusions disposed on bases of the spring module groups; and the one frame is assembled with one set of the spring module groups.
3. The assembled-type spring mattress according to claim 2, **characterized in that:** two ends of another frame of the frames with two different lengths are bent upward to form bent portions, and when the spring module groups fully cover the bed frame, bent ends of the bent portions abut the bases on outermost ones of the spring module groups.
4. The assembled-type spring mattress according to claim 2, **characterized in that:** a spring module group is constructed by a connecting base and the plurality of spring units disposed on the connecting base; and a long side of the connecting base is configured to have a rotatable half-folding structure; and the frames are configured to be sleeved on the spring module groups that are half-folded via the connecting base using one or more grid layers thereof.
5. The assembled-type spring mattress according to claim 1, **characterized in that:** the positioning members comprise a plurality of protrusions disposed on the one frame and grooves disposed on end faces of the spring units, and one of the protrusions is inserted into one of the grooves.
6. The assembled-type spring mattress according to claim 5, **characterized in that:** a spring unit comprises a spring fixing seat and a spring sleeve that are mutually buckled together, and the spring sleeve is configured to accommodate a tapered spring therein; and the spring sleeve comprises an inner cavity for stacking another spring sleeve; and the spring fixing seat comprises a hole corresponding to the inner cavity for providing clearance for stacking another spring sleeve.
7. The assembled-type spring mattress according to claim 6, **characterized in that:** the grooves are

disposed on end faces of the spring sleeves away from spring bases, and the end faces correspond to tapered tops of the tapered springs.

8. The assembled-type spring mattress according to claim 7, **characterized in that**: a plurality of connecting members are disposed at equal intervals along peripheral edges of the spring bases; and a connecting member comprises a buckling point and a buckling groove; and the plurality of spring units are configured such that the buckling point on one of the spring bases is buckled to the buckling groove on another one of the spring bases, and the spring bases form a supporting surface of the mattress via the buckled connection between the buckling points and the buckling grooves. 5
9. The assembled-type spring mattress according to claim 8, **characterized in that**: the connecting members comprise two protrusions between the buckling point and the buckling groove, one of the two protrusions comprises a recessed cavity for receiving another protrusion thereof; and another protrusion on one of the spring bases is inserted into the recessed cavity of another one of the spring bases. 10 15 20 25
10. An assembled-type spring mattress, which comprises spring units and bottom plates, the spring units comprise spring fixing seats or spring connecting bases, end covers and spring sleeves, the spring sleeves are connected between the end covers and the spring fixing seats or the spring connecting bases, the spring sleeves are configured to accommodate springs therein, multiple ones of the spring units are disposed in an aligned arrangement or a staggered arrangement, **characterized in that**, positioning members are disposed on end faces of the spring units and the bottom plates, and the spring units are connected to the bottom plates via the positioning members. 30 35 40
11. The assembled-type spring mattress according to claim 10, **characterized in that**, the positioning members comprise grooves disposed on end faces of the springs and corresponding protrusions disposed on the bottom plates. 45
12. The assembled-type spring mattress according to claim 10, **characterized in that**, the bottom plates form a bed frame, the frame is formed by mutually inserting a plurality of crisscross frames; and steel wires of the frames are bent upward to form the protrusions configured to have a positioning fit with the grooves on the end covers of the spring units, and the spring units are fixed on the frames. 50 55

13. The assembled-type spring mattress according to claim 11, **characterized in that**: the grooves are disposed on the end covers of the spring units away from the spring fixing seats or the spring connecting base, and the spring connecting base or the spring fixing seats are configured to form an upper surface of the mattress.

14. The assembled-type spring mattress according to any one of claim 12, **characterized in that**, the frames comprises a folding structure along a length direction thereof, the frame are folded via the folding structure to have a length identical to that of the spring units, or a number of grids thereof matches a modular quantity of the spring units formed by stacking the spring units.

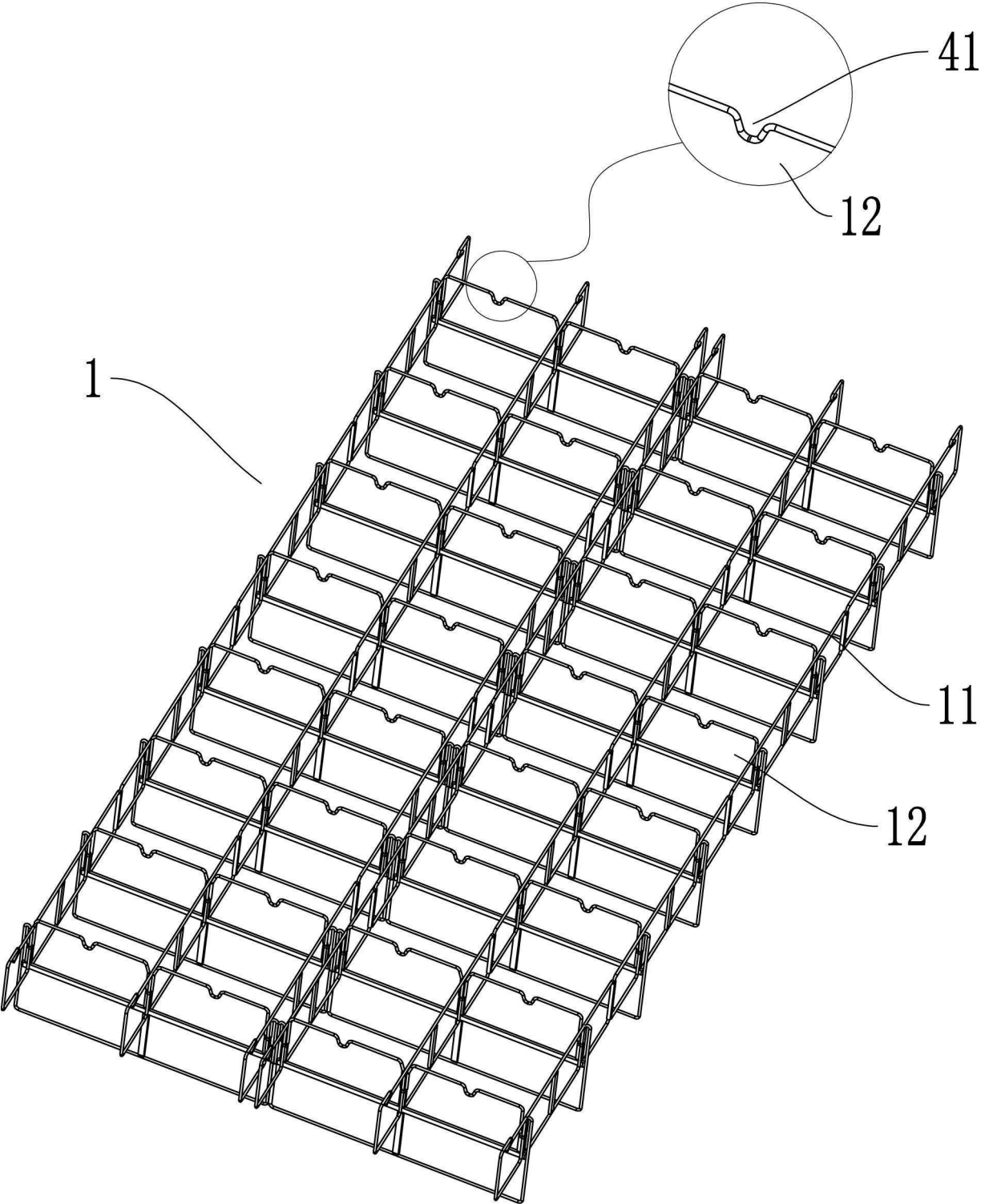


FIG. 1

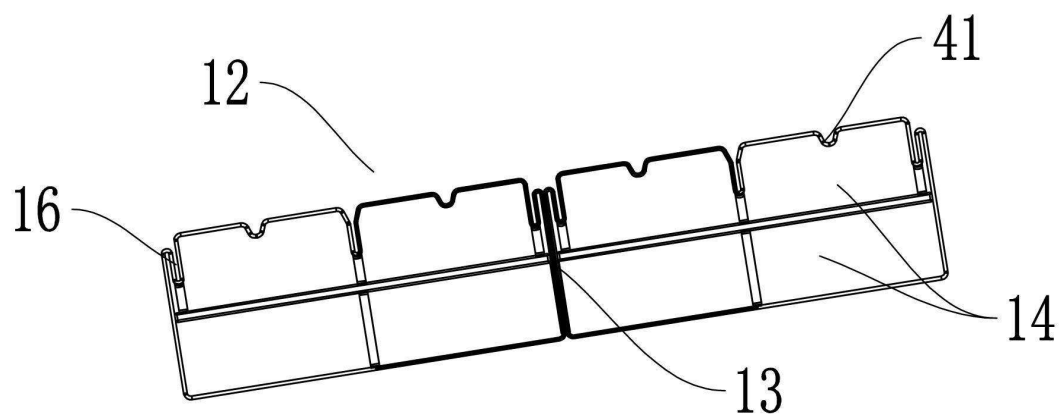


FIG. 2

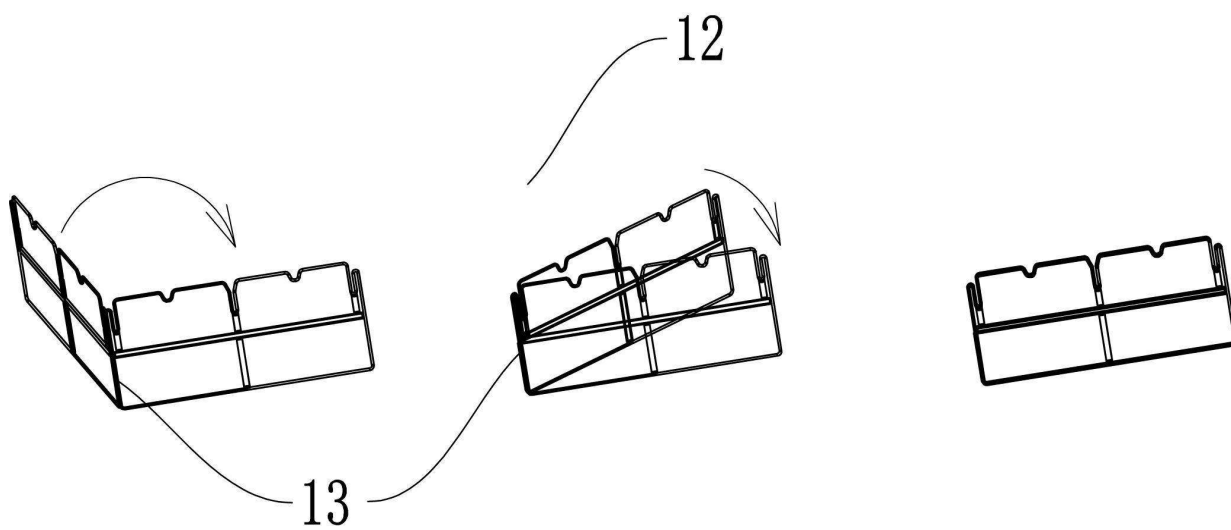


FIG. 3

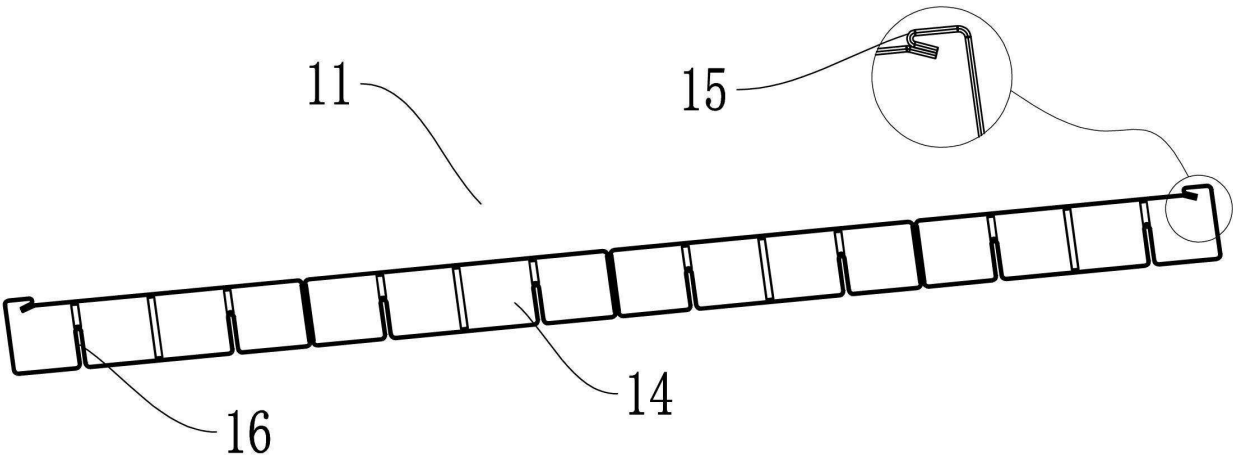


FIG. 4

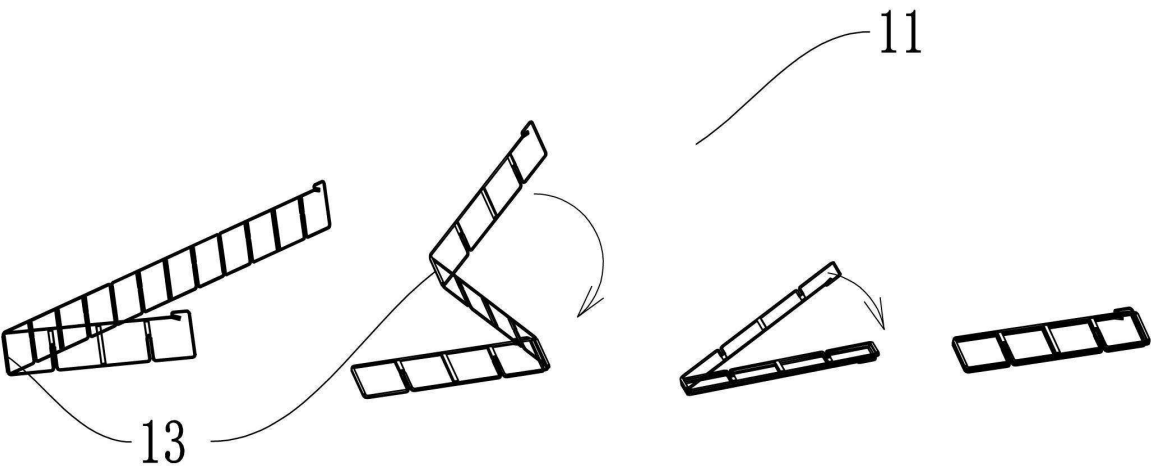


FIG. 5

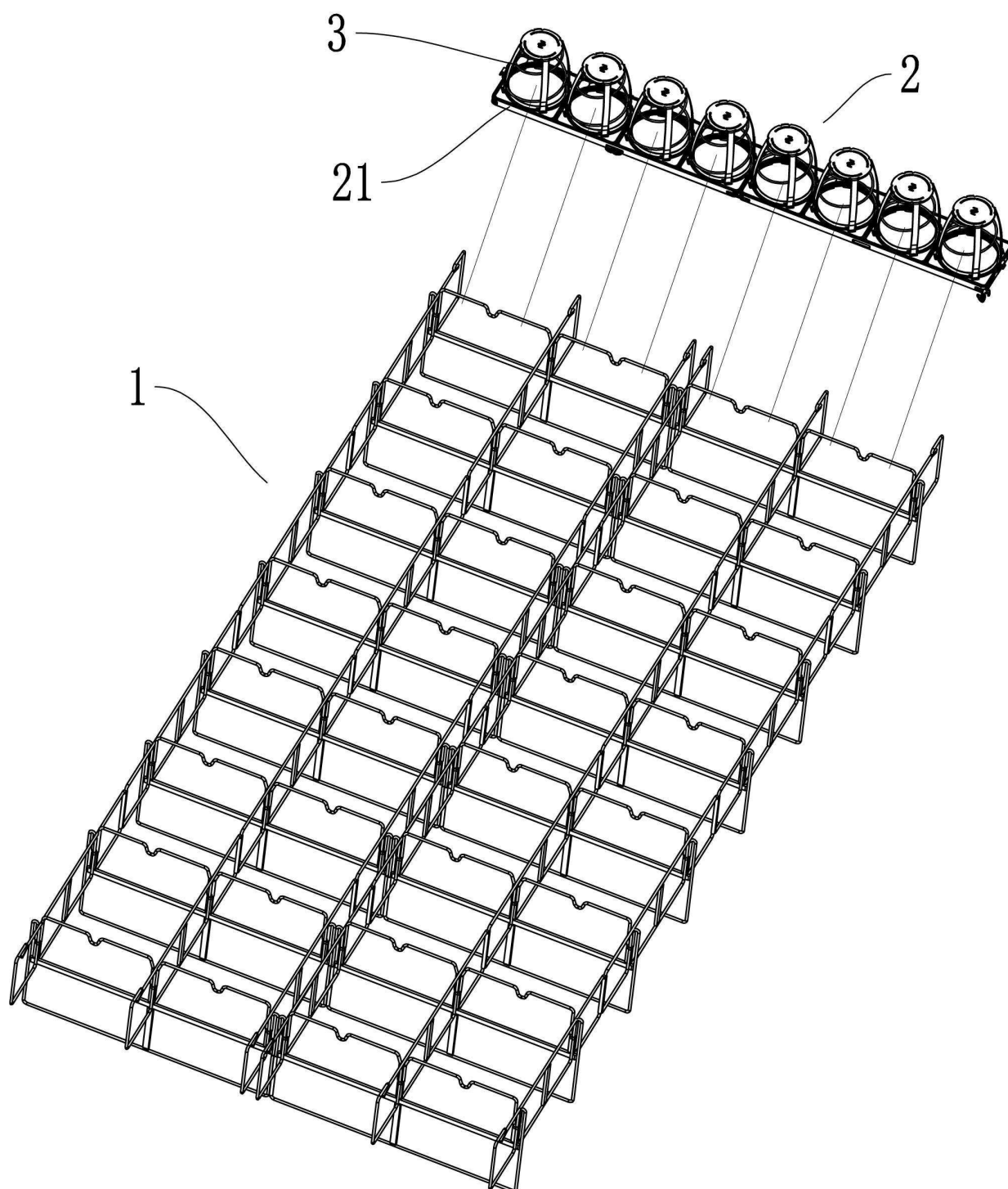


FIG. 6

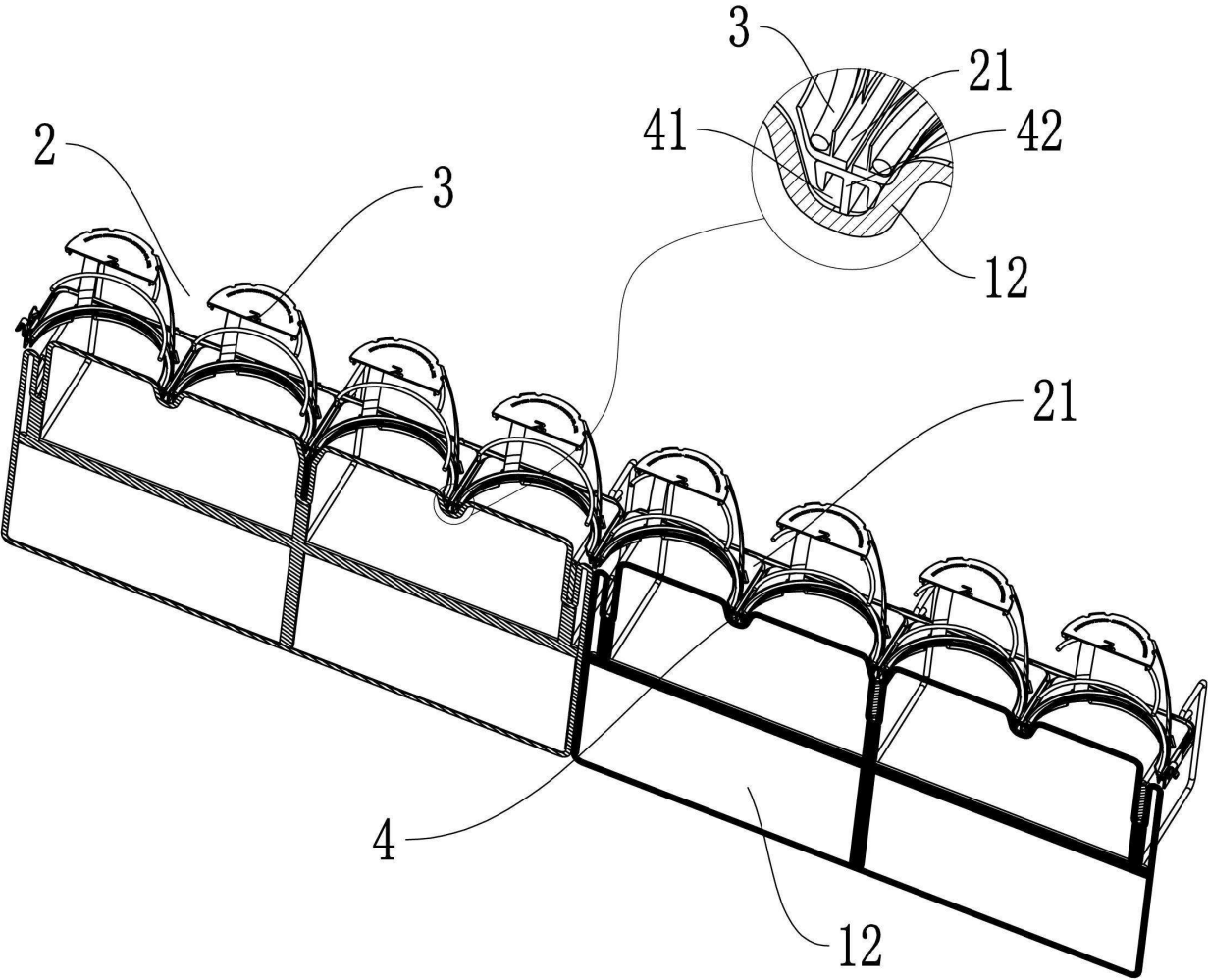


FIG. 7

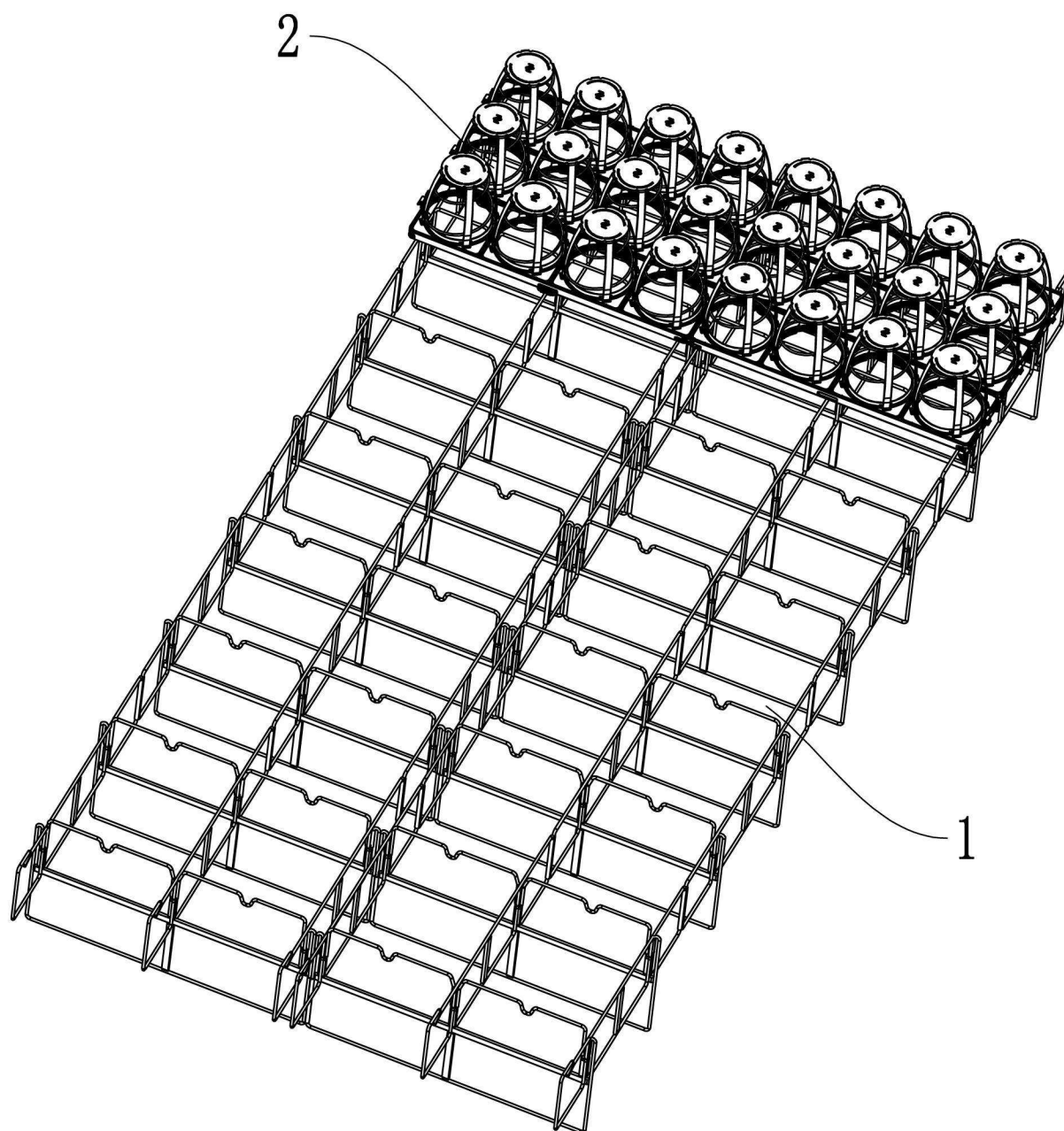


FIG. 8

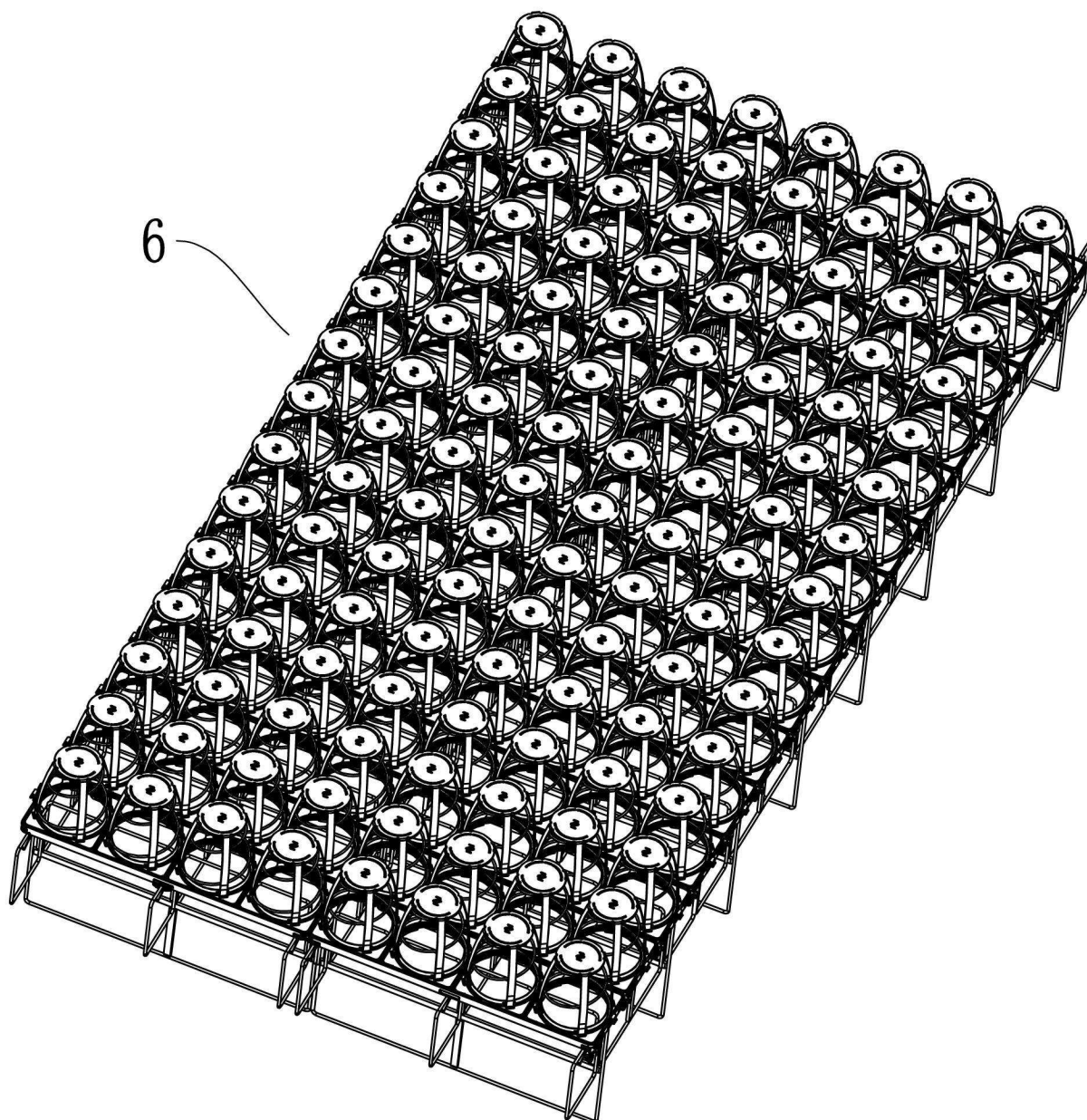


FIG. 9

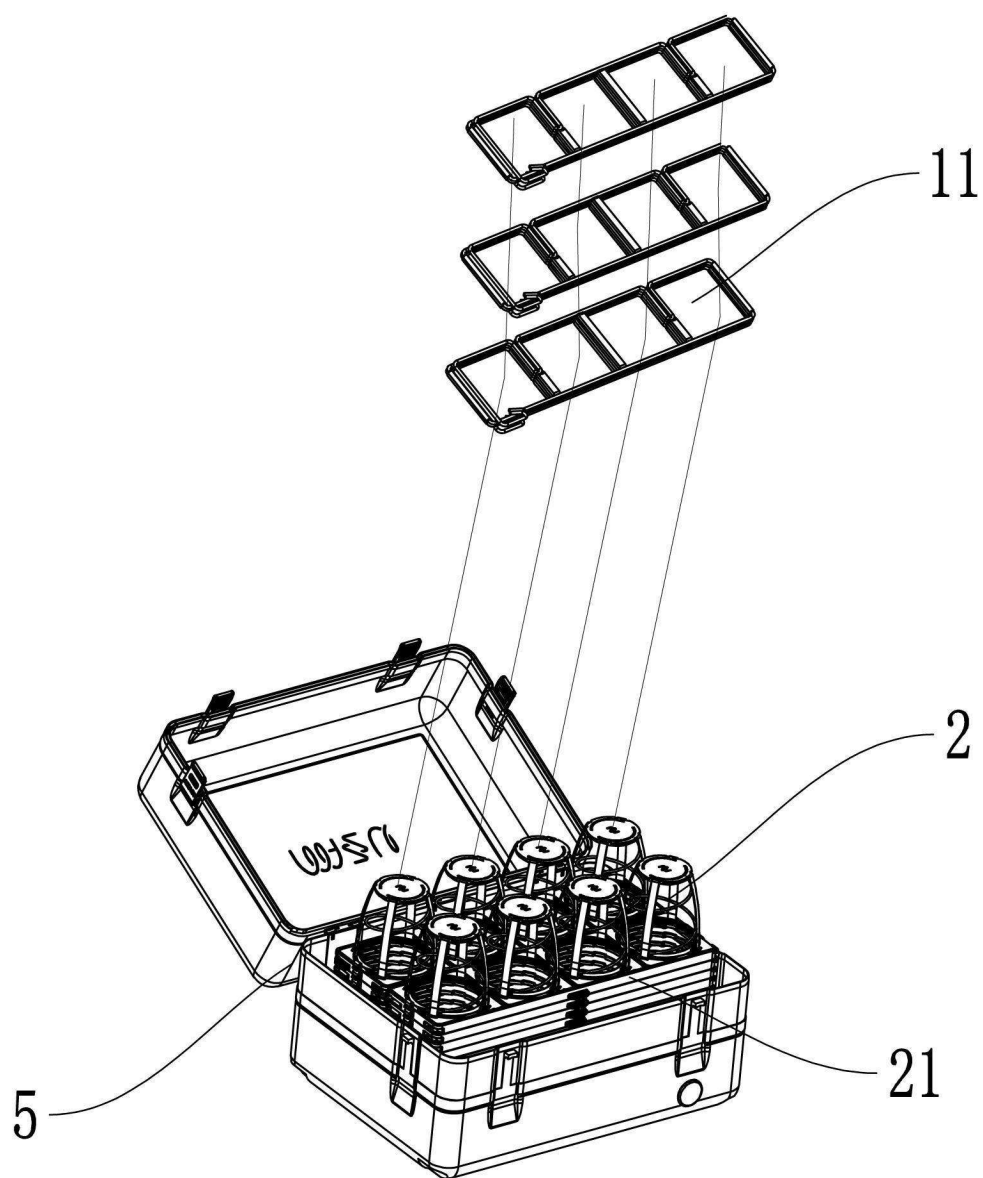


FIG. 10

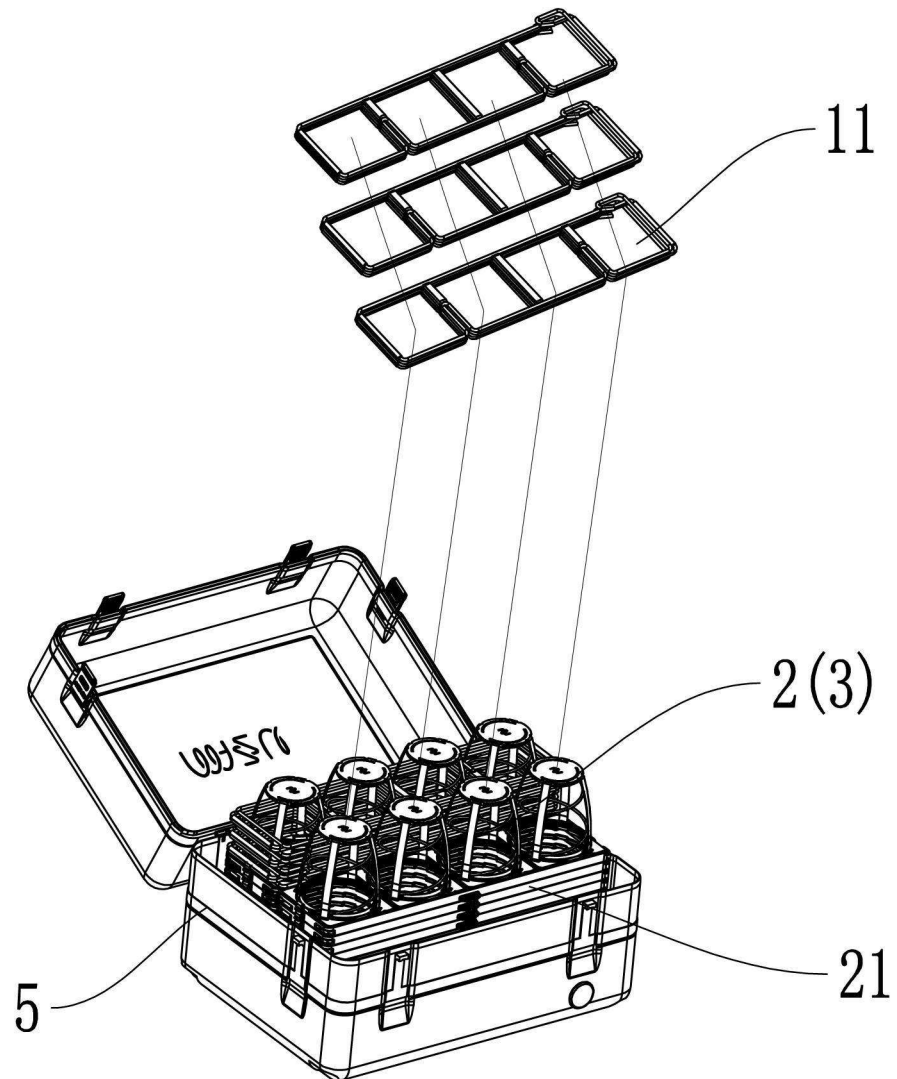


FIG. 11

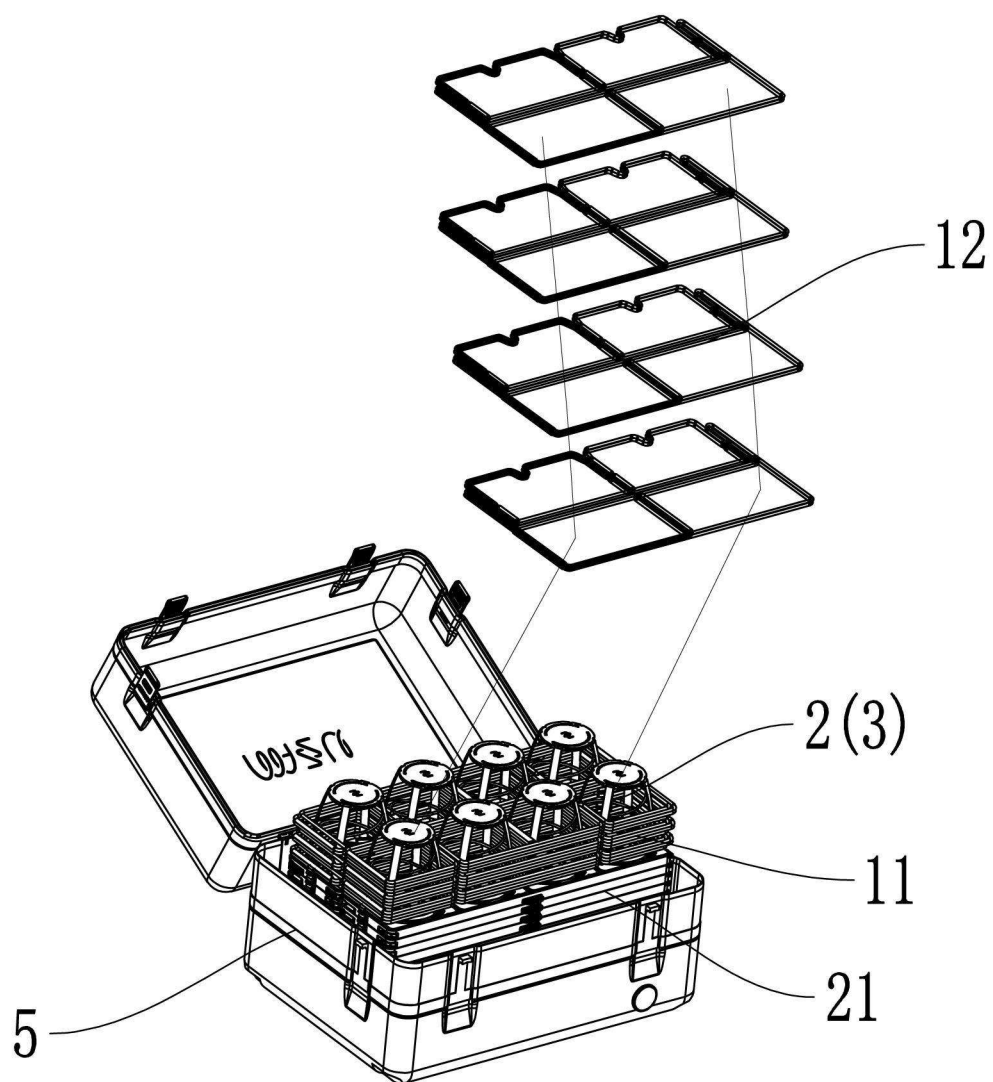


FIG. 12

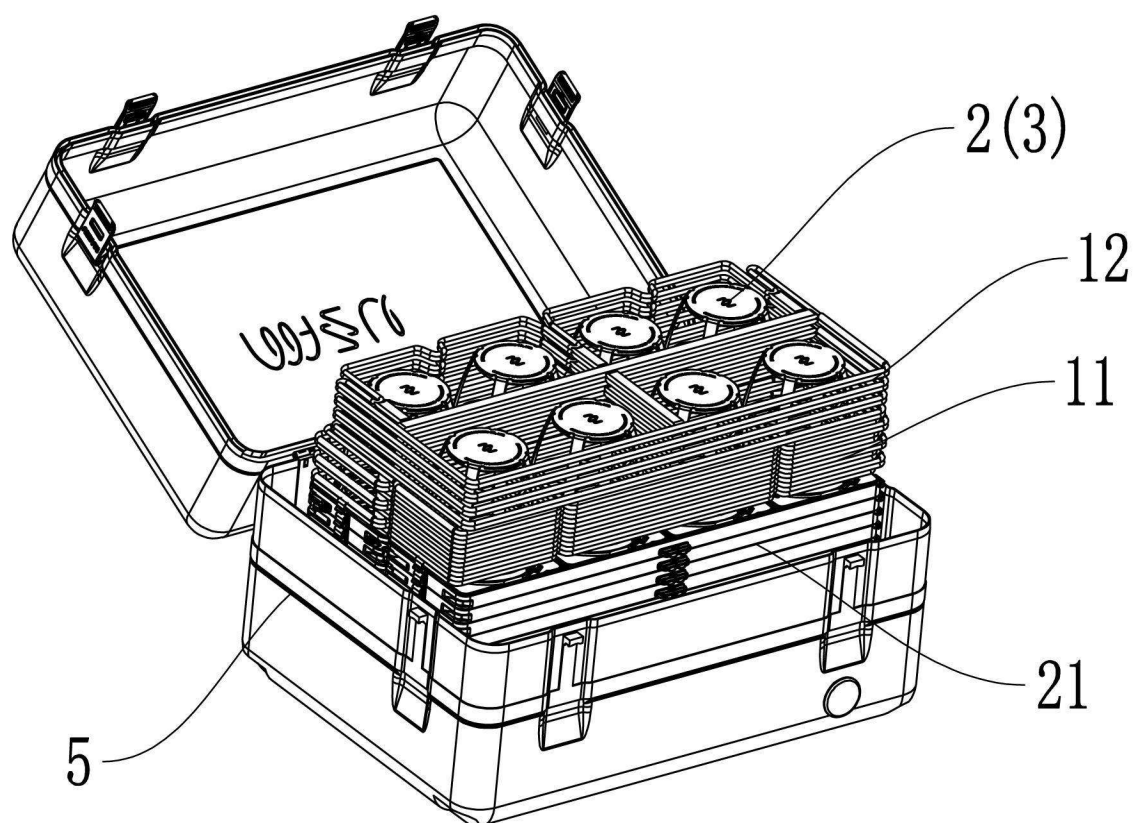


FIG. 13

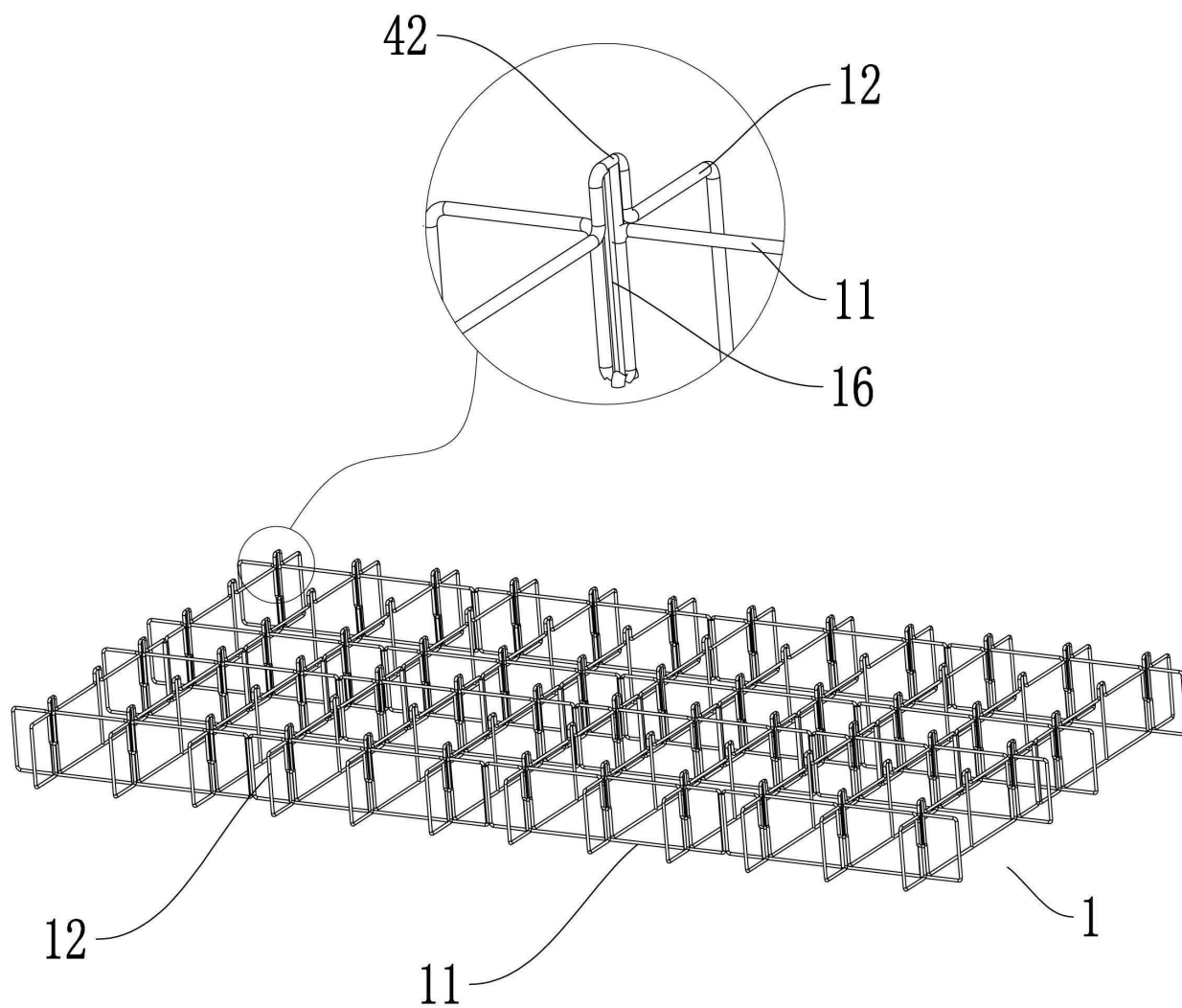


FIG. 14

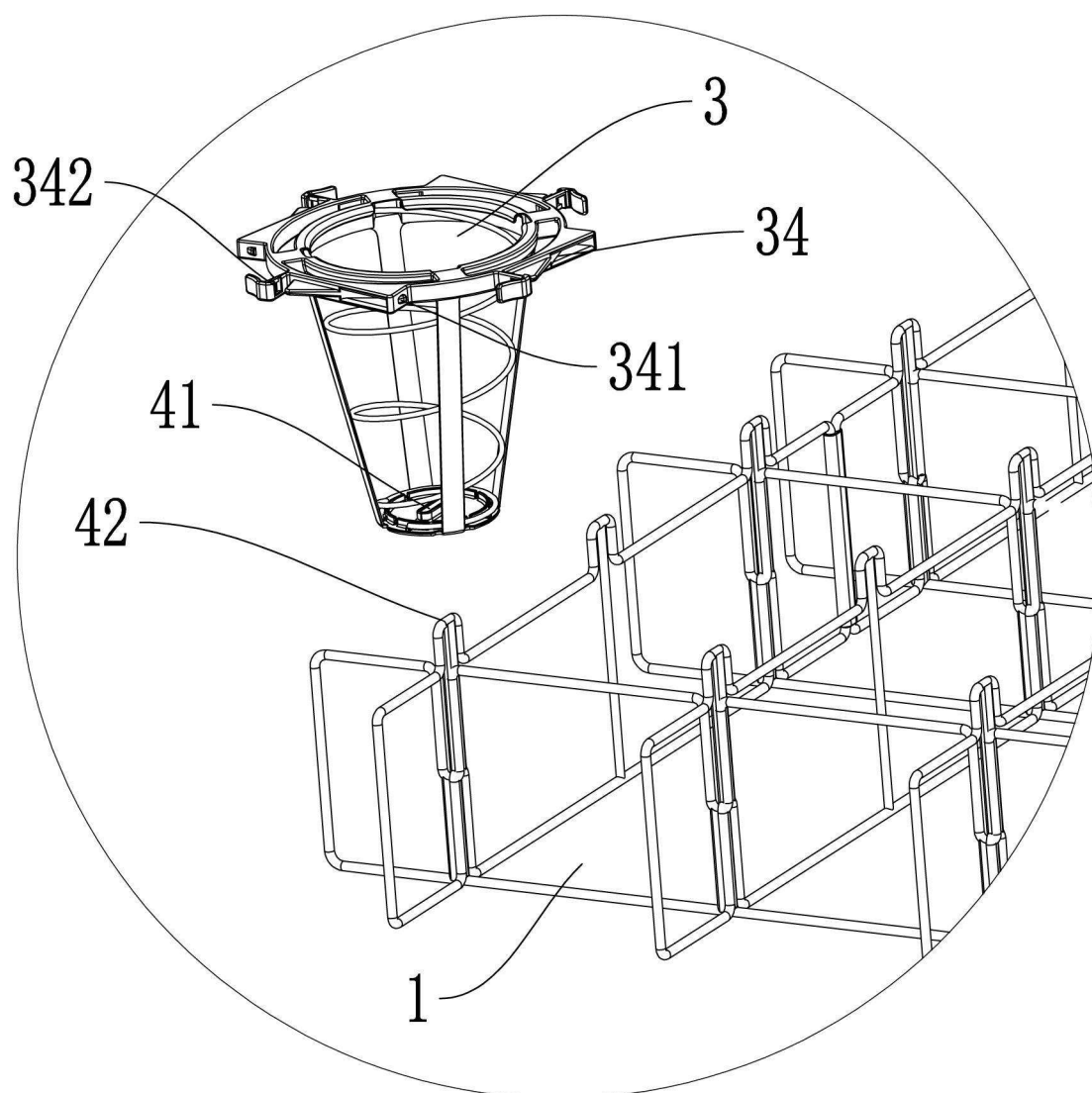


FIG. 15

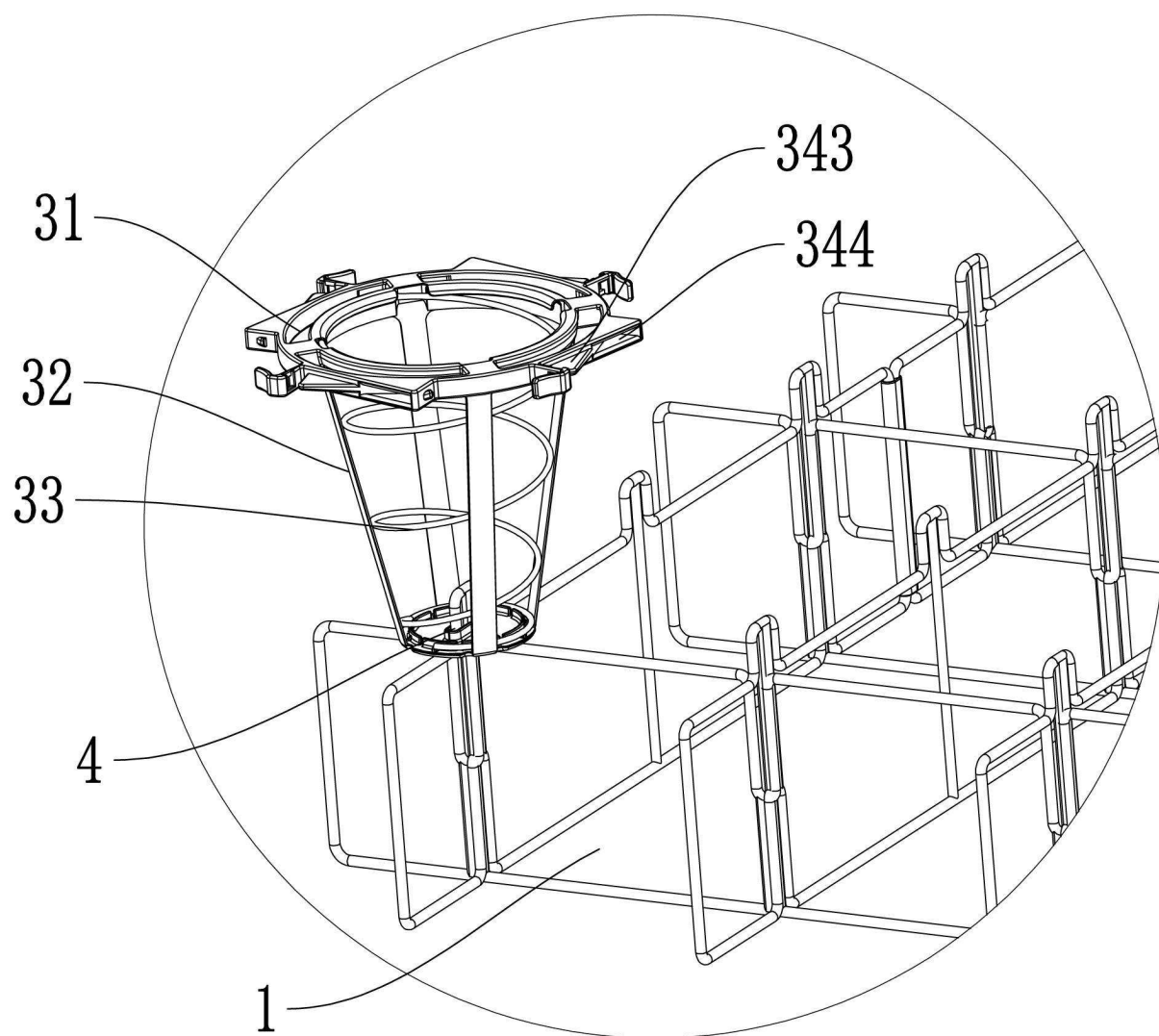


FIG. 16

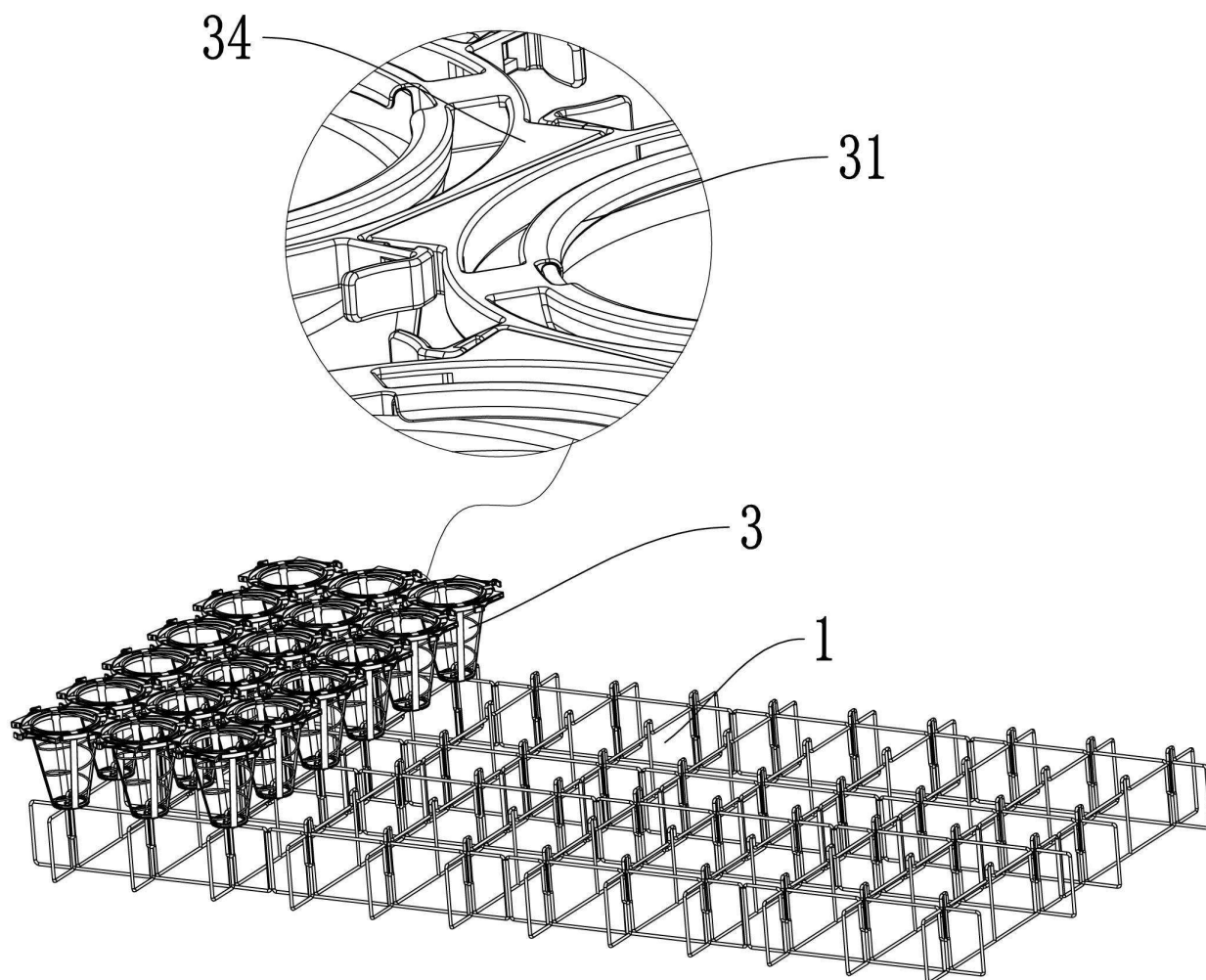


FIG. 17

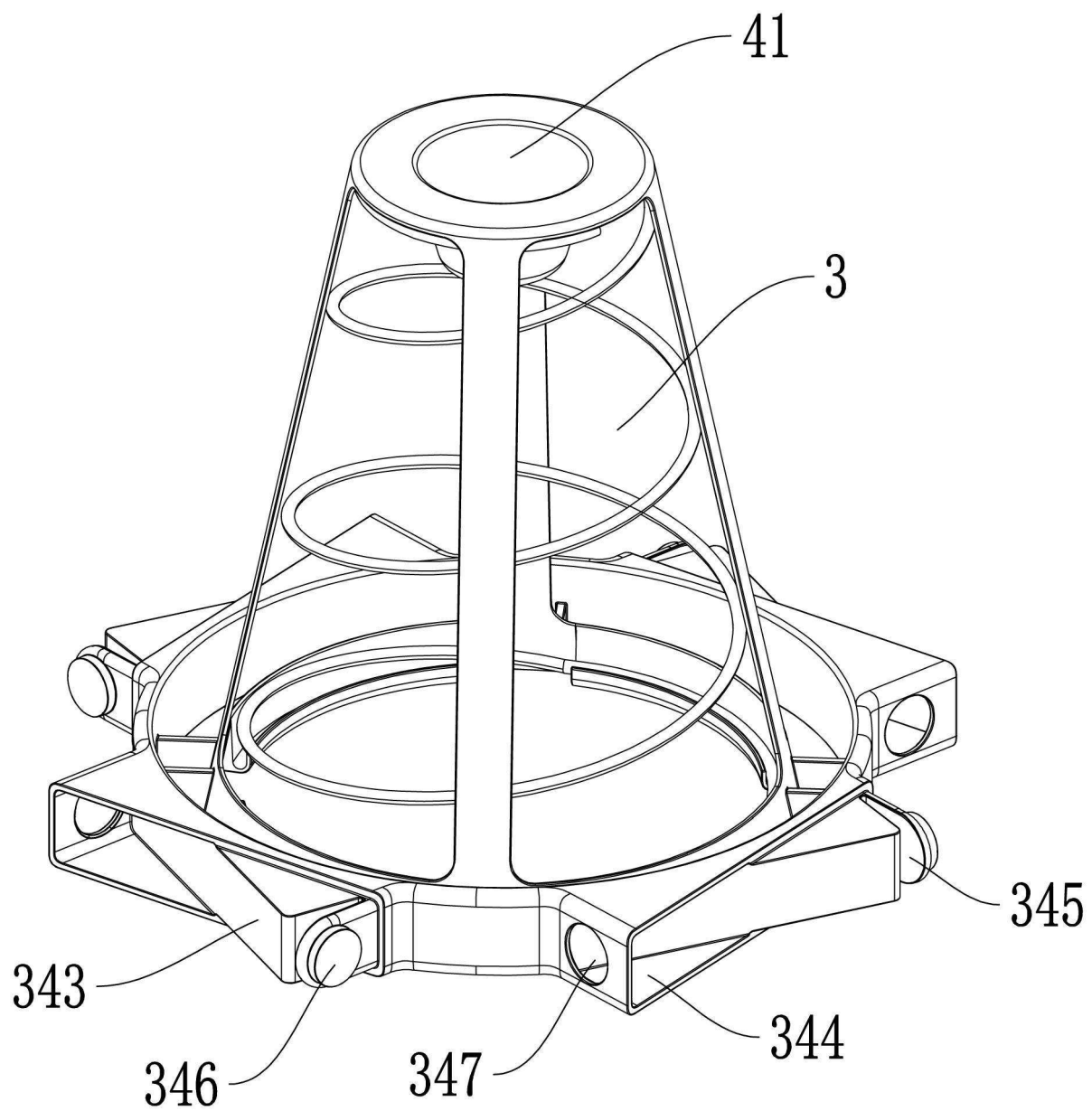


FIG. 18

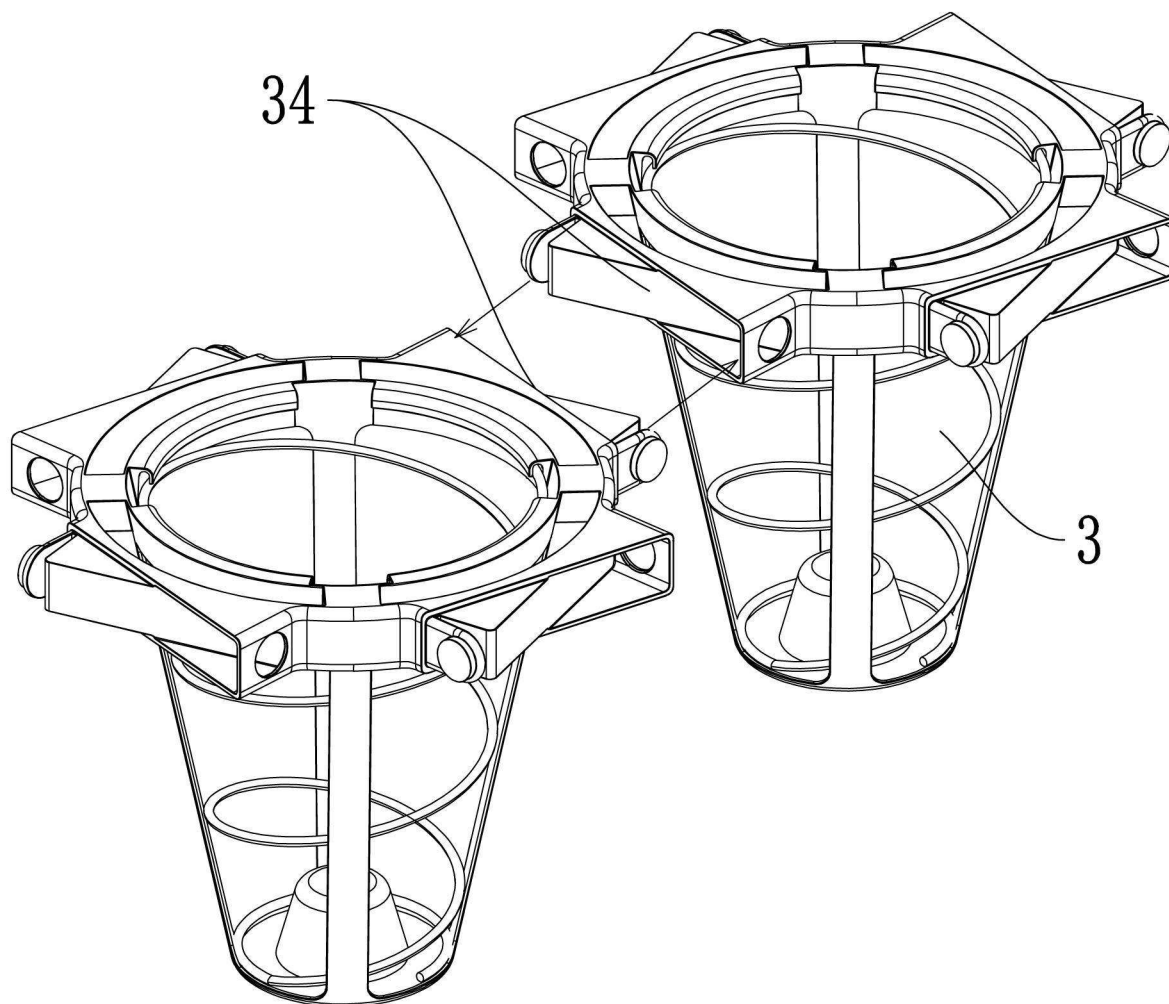


FIG. 19

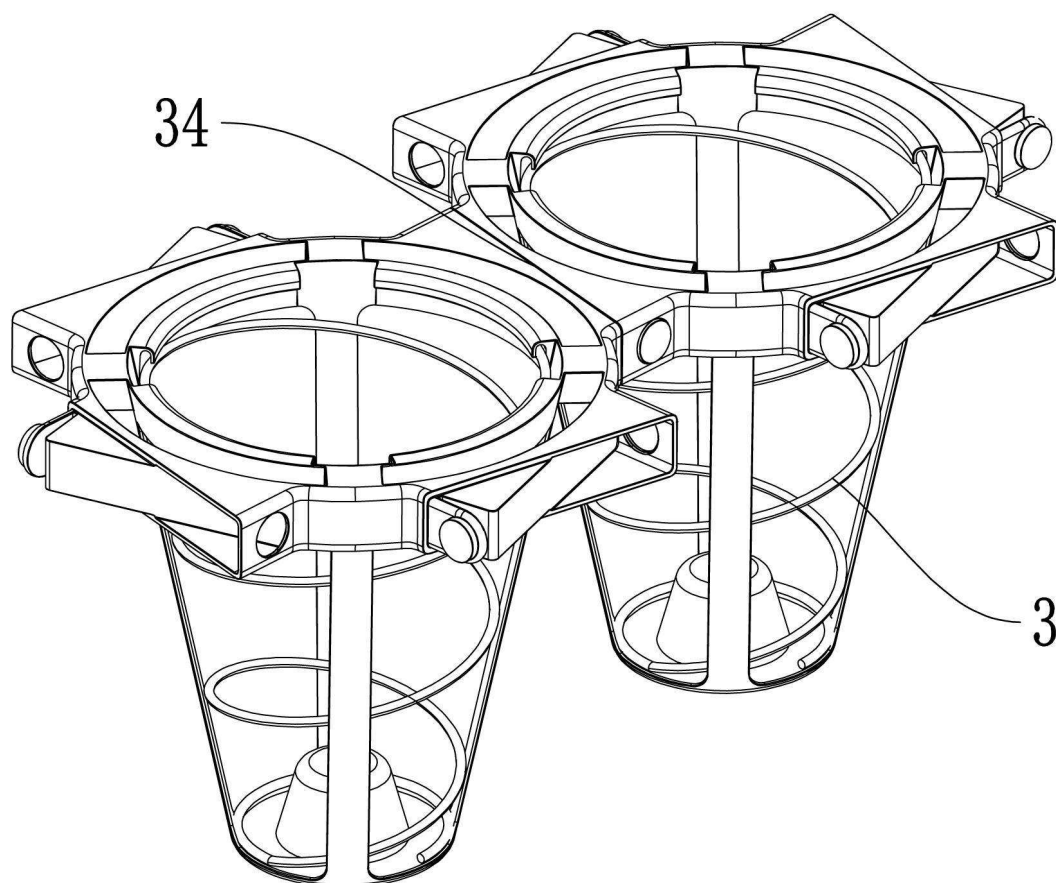


FIG. 20

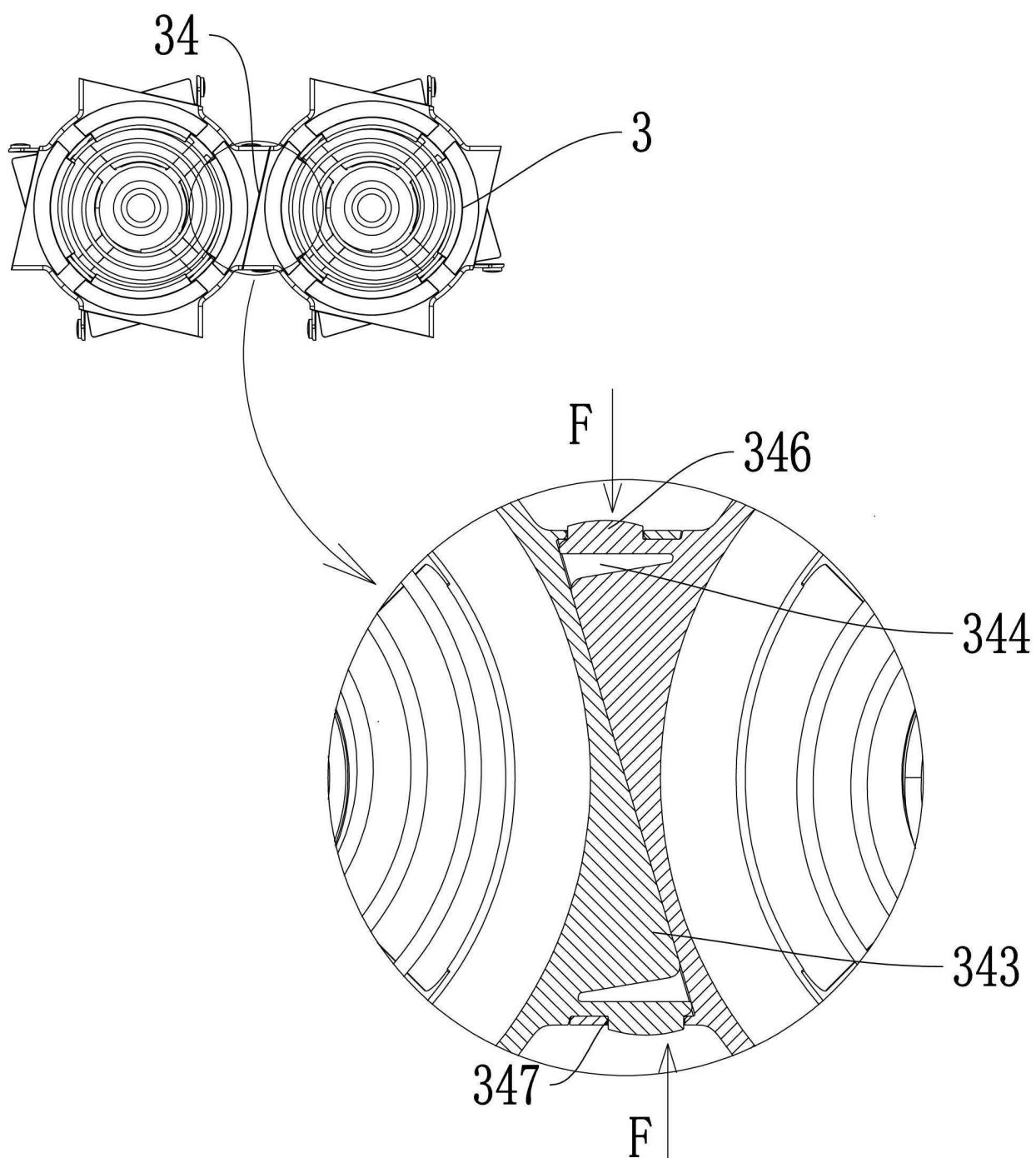


FIG. 21

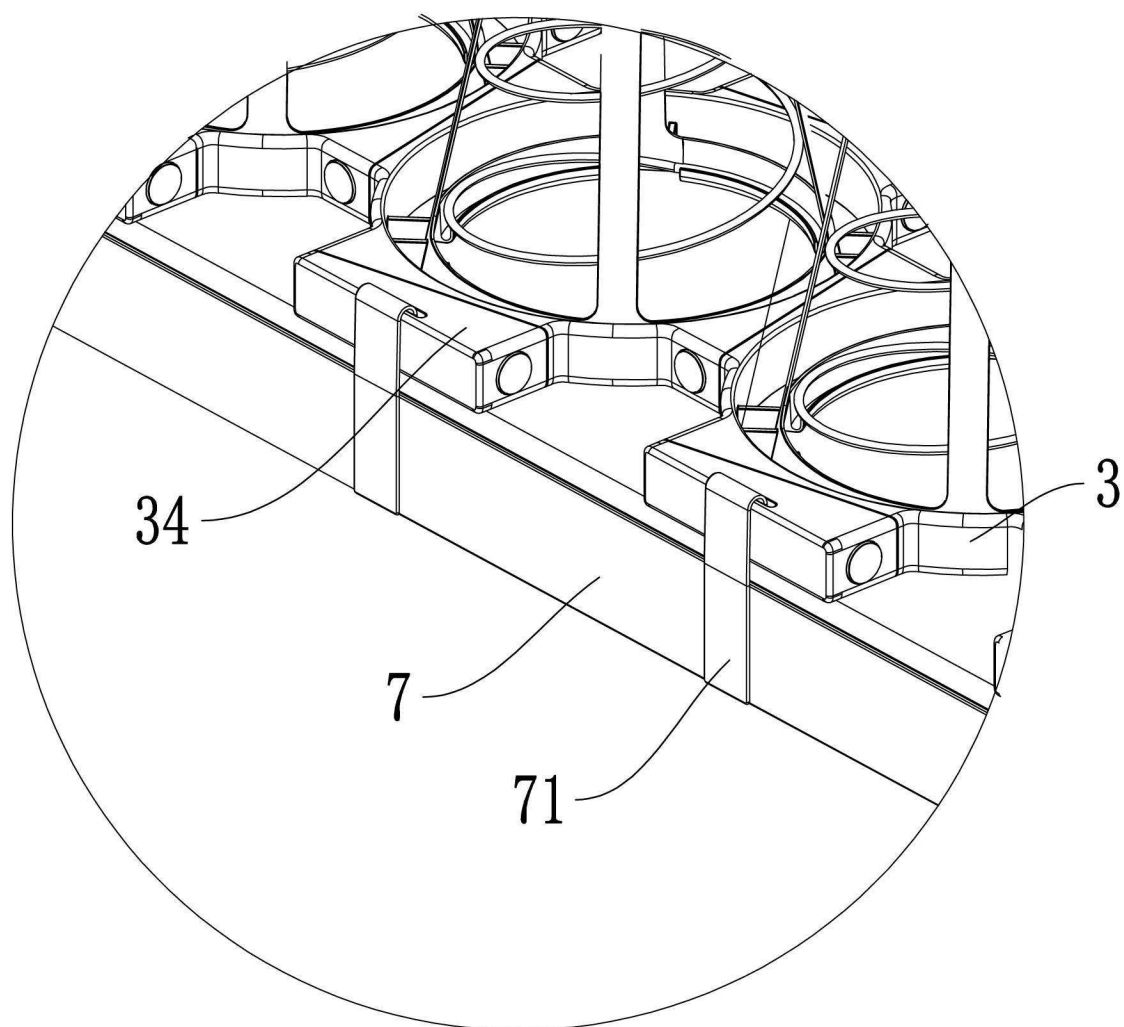


FIG. 22

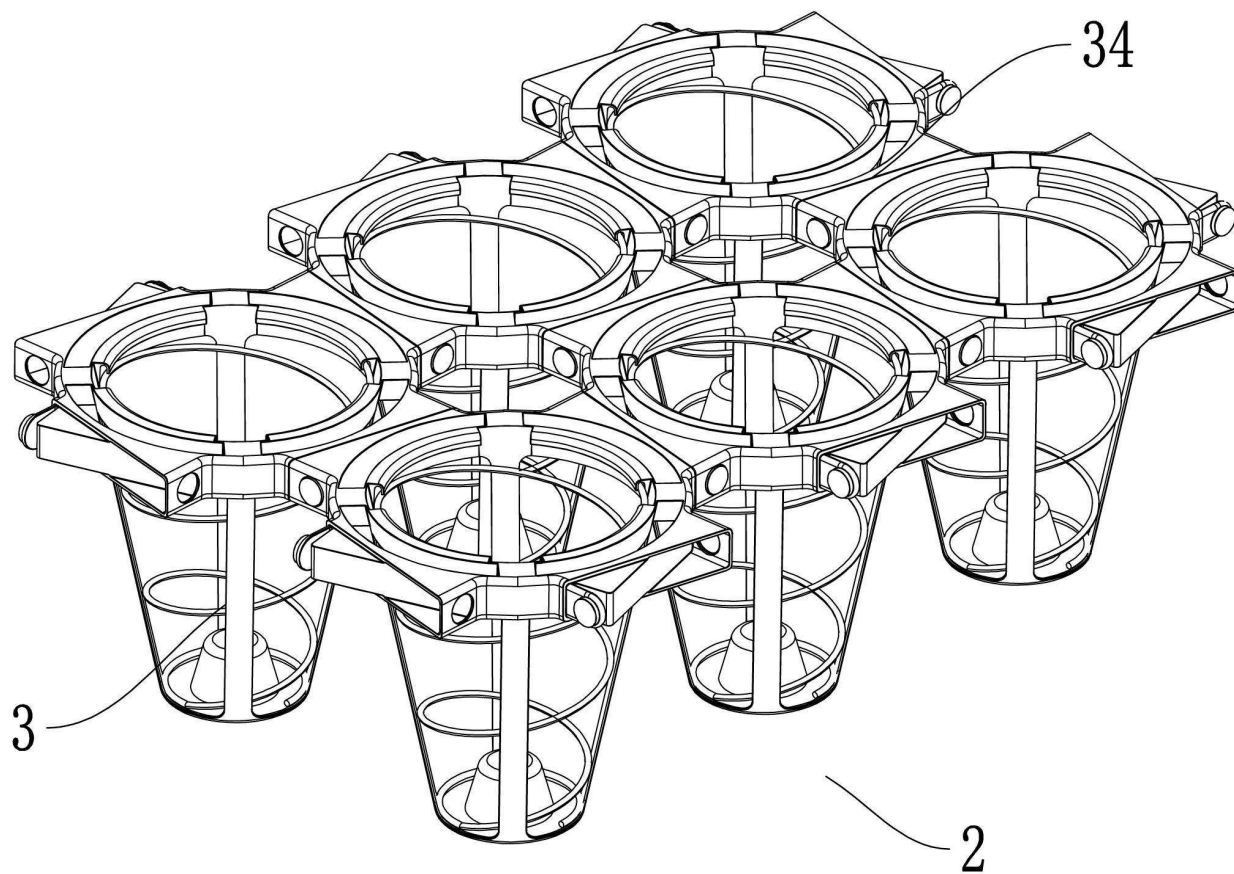


FIG. 23

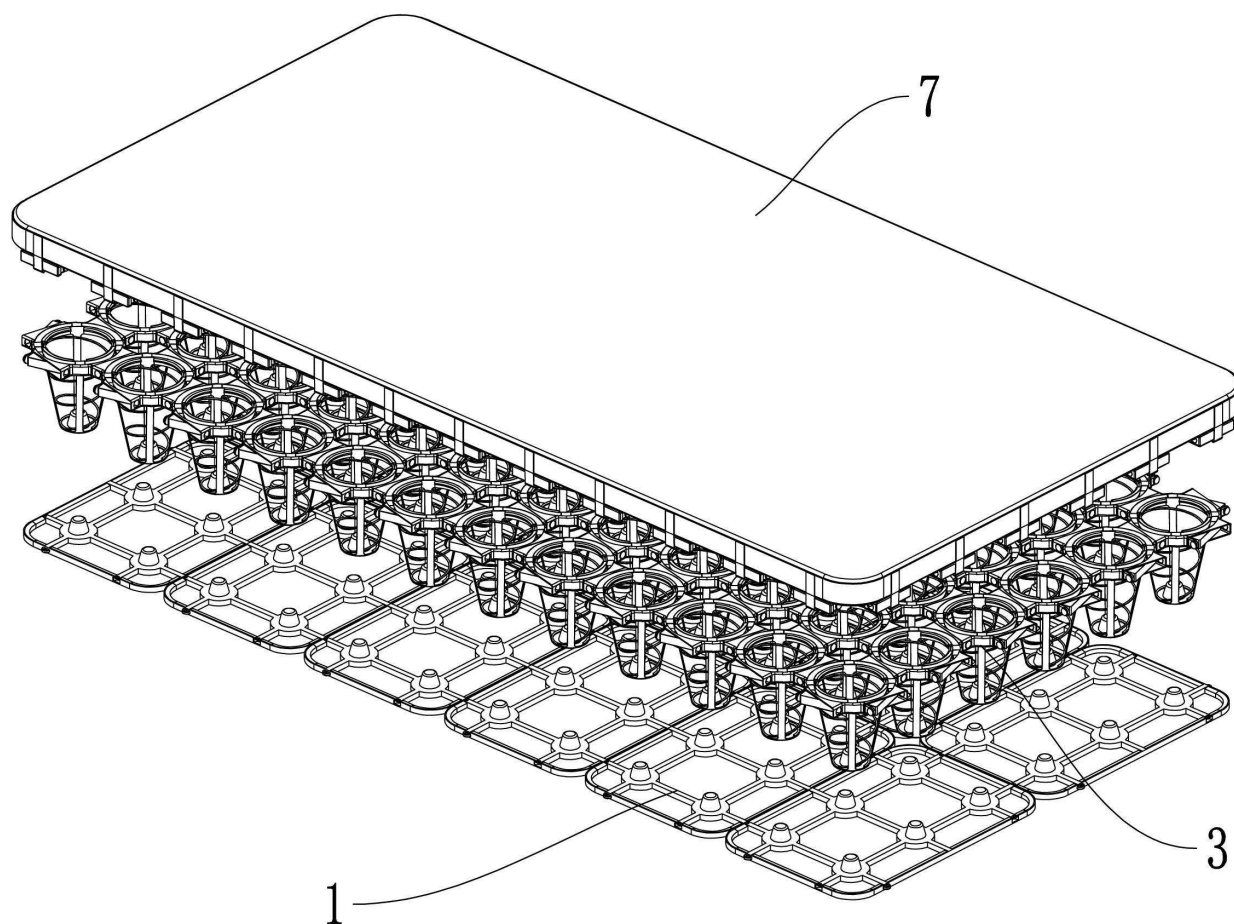


FIG. 24

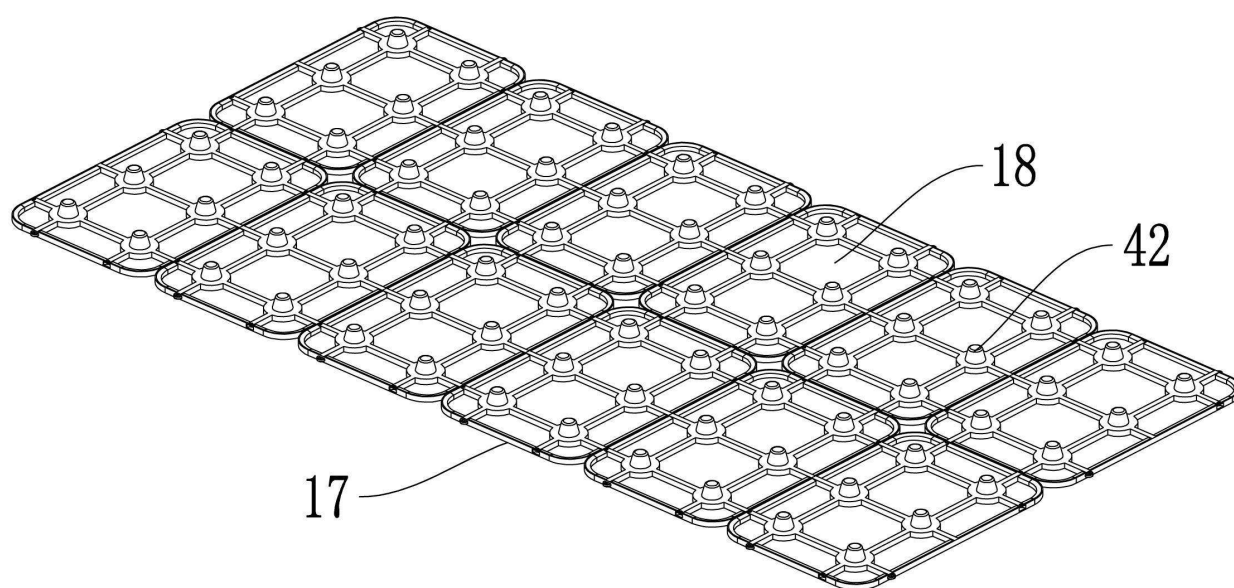


FIG. 25

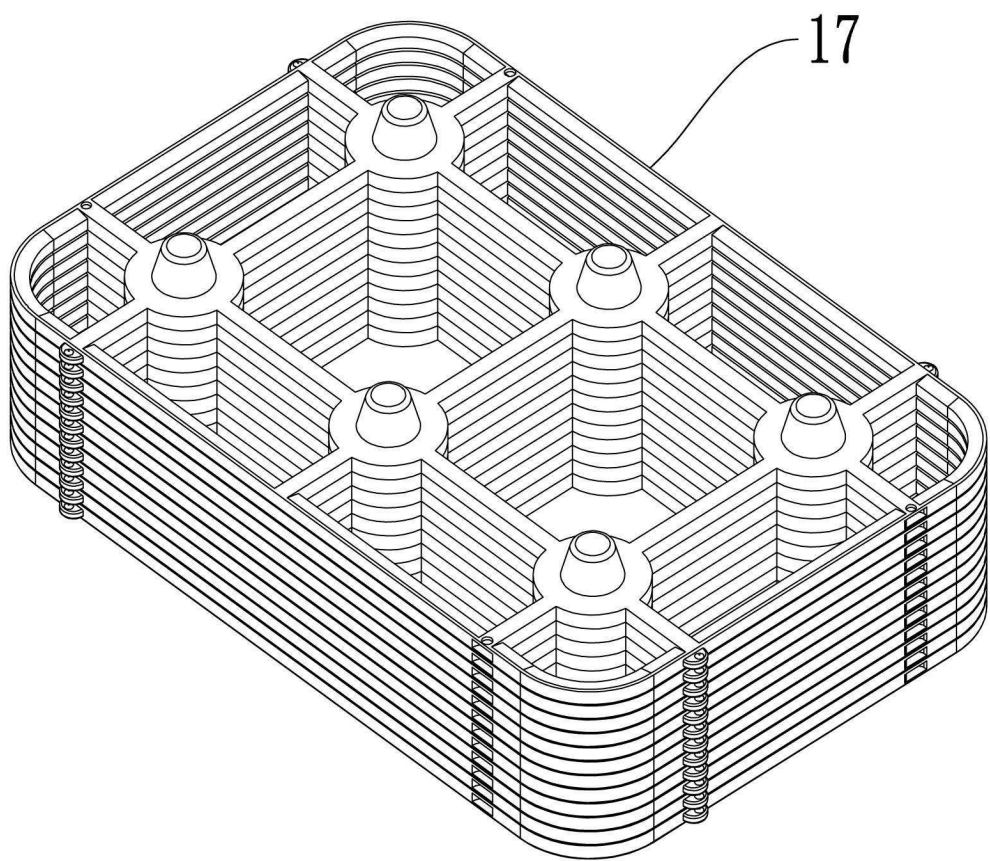


FIG. 26

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2024/139126

A. CLASSIFICATION OF SUBJECT MATTER

A47C23/053(2006.01)i; A47C23/043(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

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

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

CNTXT, CNABS, CNKI, WPABSC, ENTXTC, ENTXT, DWPI: 厦门新技术集成, 冷鹭浩, 组合, 组立, 拆卸, 便携, 模块, 分体, 拼装, 拼接, 组装, 折叠, 床垫, 弹性垫, 框架, 弹簧, 弹性, portable, combin+, assemble, fold+, matt?ess, elastic+, cushion, spring, frame

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 221489536 U (NEW TEC INTEGRATION XIAMEN CO., LTD.) 09 August 2024 (2024-08-09) description, paragraphs [0070]-[0113], and figures 1-26	1-14
X	CN 112674535 A (NEW TEC INTEGRATION XIAMEN CO., LTD.) 20 April 2021 (2021-04-20) description, paragraphs [0007] and [0225]-[0342], and figures 1A-6, 12A-13D, and 16	10-13
A	CN 207721529 U (XIAMEN ZHIYANG METAL PRODUCTS MANUFACTURING CO., LTD.) 14 August 2018 (2018-08-14) entire document	1-14
A	CN 220024629 U (JIAXING MUSI SMART HOME CO., LTD.) 17 November 2023 (2023-11-17) entire document	1-14
A	KR 101464892 B1 (JANG, Soon Howa) 26 November 2014 (2014-11-26) entire document	1-14

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

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"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 05 March 2025	Date of mailing of the international search report 10 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/CN2024/139126

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	TW 201615132 A (XU HANZHONG) 01 May 2016 (2016-05-01) entire document	1-14
A	US 2002100118 A1 (MOSSBECK, Neils S. et al.) 01 August 2002 (2002-08-01) entire document	1-14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN2024/139126

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	221489536	U	09 August 2024	None			
CN	112674535	A	20 April 2021	CN	112674535	B	01 October 2024
				CN	118986106	A	22 November 2024
				WO	2021073588	A1	22 April 2021
CN	207721529	U	14 August 2018	None			
CN	220024629	U	17 November 2023	None			
KR	101464892	B1	26 November 2014	None			
TW	201615132	A	01 May 2016	EP	201615132	A1	27 April 2016
				TW	I556770	B	11 November 2016
US	2002100118	A1	01 August 2002	WO	02060301	A1	08 August 2002
				US	6484339	B2	26 November 2002

REFERENCES CITED IN THE DESCRIPTION

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- CN 202323425906 [0001]