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(54) TENT HAVING REINFORCEMENT MECHANISM

(57) Provided in the present disclosure is a tent. The tent comprises at least three leg poles; a plurality of outer telescopic units, connected between each two adjacent leg poles; a plurality of inner telescopic units, each inner telescopic unit being connected to each leg pole and provided with an inner end part, and the outer telescopic units and the inner telescopic units constituting a top frame of the tent; and a center lock, used for locking the tent in an unfolded state when implementing locking, and allowing the tent to be folded into a folded state when implementing unlocking, the inner end parts of the inner telescopic units being rotatably connected to the center lock. The tent further comprises: at least one reinforcement pole unit, having an outer end part and an inner end part, the outer end part of the reinforcement pole unit being rotatably connected to an outer telescopic unit, and the inner end part of the reinforcement pole unit being rotatably connected to the center lock. The tent shows relatively high strength, and avoids inward complete deformation of the outer telescopic units.

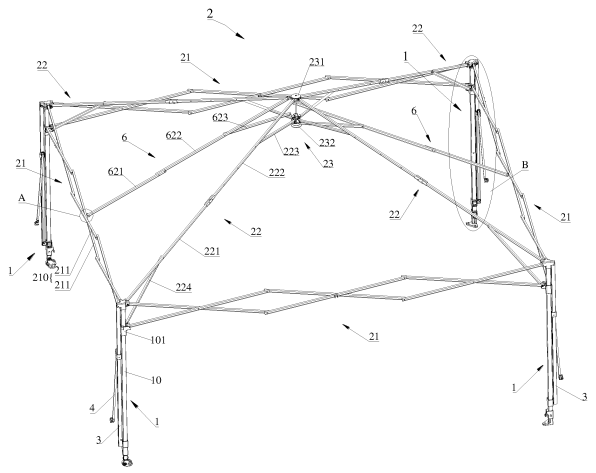

FIG. 1

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Description

[0001] The present application claims priority to Chinese Patent Application No. CN 2022207262950 filed on March 28, 2022.

TECHNICAL FIELD

[0002] The present disclosure pertains to the field of outdoor articles, and relates to a canopy, and in particular, to a canopy having a reinforcement mechanism.

BACKGROUND

[0003] A canopy is widely used in outdoor activities, such as outdoor camping, or the like, and has functions of windproof, rainproof, anti-mosquito and warmth keeping. The canopy is usually designed to be foldable to have an unfolded state and a folded state benefit for carrying and storage. A top frame of a foldable canopy is typically composed of a plurality of outer retractable units and a plurality of inner retractable units, each outer retractable unit is connected between adjacent legs, an outer end portion of each inner retractable unit is connected to one corresponding leg, inner end portions of the inner retractable units are connected by a center lock, and the center lock locks the canopy in the unfolded state or allows the canopy to be converted to the folded state after unlocking. The outer retractable units of some canopies, especially canopies of large sizes, have insufficient strength and are prone to inward bending deformation.

SUMMARY

[0004] The present disclosure provides an improved canopy having a reinforcement mechanism, which has relatively high strength, and avoids inward deformation of outer retractable units.

[0005] A canopy is provided, including:

at least three legs;

a plurality of outer retractable units, each outer retractable unit being connected between two adjacent legs of the at least three legs;

a plurality of inner retractable units, each inner retractable unit being connected to one of the at least three legs and having an inner end portion, and the outer retractable units and the inner retractable units constituting a top frame of the canopy; and

a center lock configured to lock the canopy in an unfolded state after locking, and allow the canopy to be folded into a folded state after unlocking, the inner end portion of each inner retractable unit being rotatably connected to the center lock;

the canopy further including:

at least one reinforcing rod unit having an outer end portion and an inner end portion, the outer end portion of the reinforcing rod unit being rotatably connected to one of the plurality of outer retractable units, and the inner end portion of the reinforcing rod unit being rotatably connected to the center lock.

[0006] In an embodiment, the inner end portion of each inner retractable unit and/or the inner end portion of the reinforcing rod unit are/is rotatably connected to the center lock by a hitch mechanism, the hitch mechanism includes a hitch pin and a connecting piece which are fitted with each other, a hitch pin groove for accommodating the hitch pin is formed in the connecting piece, the hitch pin groove has a notch for the hitch pin to enter, and the notch is configured to allow the hitch pin to enter the hitch pin groove in a direction intersecting with a center line thereof. The outer retractable unit and the center lock are connected by fitting the connecting piece with the hitch pin, such that hinging by screws is avoided, assembly is convenient, assembly efficiency is improved, and a cost is reduced.

[0007] In an embodiment, the center lock has a plurality of connecting portions arranged at intervals along a perimetric direction of the center lock, opposite surfaces of two adjacent connecting portions of the plurality of connecting portions are provided with hitch pins respectively, the connecting piece is located between the two adjacent connecting portions, and the connecting piece accommodates two hitch pins.

[0008] In an embodiment, the connecting piece includes a plug connected with or integrally formed with the inner end portion of each inner retractable unit or the reinforcing rod unit and a hook portion extending in a bending mode, one end of the hook portion and the plug are fixedly connected or integrally formed, the hitch pin groove is formed between the hook portion and the plug, and the notch is formed between the other end of the hook portion and the plug.

[0009] In an embodiment, a connecting rib is connected between the other end of the hook portion and the plug, and two notches are provided on two opposite sides of the connecting rib respectively.

[0010] In an embodiment, the center lock comprises a top cap and a bottom cap which are locked or unlocked respect to each other, the top cap and the bottom cap are provided with hitch pins respectively, and the connecting piece comprises an upper connecting piece connected to the hitch pin on the top cap and a lower connecting piece connected to the hitch pin on the bottom cap.

[0011] In an embodiment, the hook portion of the upper connecting piece has a first inclined inner surface opposite to the plug thereof.

[0012] In an embodiment, the notch of the hitch pin groove faces upwards, the hook portion of the lower connecting piece has a second inclined inner surface opposite to the plug thereof and a limiting inner surface opposite to the hitch pin located therein, the limiting inner surface is located between the second inclined inner surface and the notch, and an edge of the limiting inner surface close to the notch is lower than an edge of the

limiting inner surface close to the second inclined inner surface.

[0013] In an embodiment, the reinforcing rod unit includes a first reinforcing rod and a second reinforcing rod which are rotatably connected, an end portion of the first reinforcing rod is provided with the upper connecting piece and rotatably connected to the top cap through the upper connecting piece, and an end portion of the second reinforcing rod is provided with the lower connecting piece and rotatably connected to the bottom cap through the lower connecting piece; and/or the inner retractable unit includes a first top rod and a second top rod which are rotatably connected, an end portion of the first top rod is provided with the upper connecting piece and rotatably connected to the top cap through the upper connecting piece, and an end portion of the second top rod is provided with the lower connecting piece and rotatably connected to the bottom cap through the lower connecting piece.

[0014] In an embodiment, the reinforcing rod unit further includes a third reinforcing rod having an end portion rotatably connected to the other end portion of the first reinforcing rod, each outer retractable unit includes at least one connecting rod assembly rotatably connected between the legs, the connecting rod assembly includes a first connecting rod and a second connecting rod which can be relatively unfolded and closed, middles of the first connecting rod and the second connecting rod are rotatably connected by a pivot, the other end portion of the third reinforcing rod is rotatably connected to a pivot base, and the pivot base is connected to the pivot.

[0015] In an embodiment, between each outer retractable unit and the center lock, one reinforcing rod unit is arranged.

[0016] In an embodiment, the canopy further comprises an overhanging rod, the overhanging rod has an unfolded position and a folded position after the canopy is unfolded, and when the overhanging rod is in the unfolded position, an inner end portion of the overhanging rod is connected to one of the legs, and an outer end portion of the overhanging rod is offset from the leg, and when the overhanging rod is in the folded position, the outer end portion of the overhanging rod and the leg are drawn close to each other.

[0017] In an embodiment, the canopy further comprises a cross rod, the cross rod has a first end portion rotatably connected to the overhanging rod and a second end portion for being detachably connected with one of the outer retractable units, the second end portion of the cross rod is disconnected from the outer retractable unit when the overhanging rod is in the unfolded position, and the second end portion of the cross rod is connected with the outer retractable unit when the overhanging rod is in the folded position; during the canopy being converted from an unfolded state to a folded state, the second end portion of the cross rod is disconnected from the outer retractable unit, and the overhanging rod is converted from the folded position to the unfolded position.

[0018] In the canopy of the present disclosure, the reinforcing rod unit is arranged between the center lock and the outer retractable unit, which can effectively improve strength of the top frame of the canopy after the canopy is unfolded, avoids the problem of inward bending deformation of the outer retractable unit, and improves the strength of the canopy.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] To describe the technical solution of the present application more clearly, the following briefly describes the accompanying drawings required for describing the embodiments. Apparently, the accompanying drawings in the following description show merely some embodiments of the present disclosure, and a person of ordinary skill in the art may still derive other drawings from these accompanying drawings without creative efforts.

FIG. 1 is a schematic structural diagram of a canopy of an embodiment of the present disclosure, wherein the overhanging rods are not extended out.

FIG. 2a is a partial enlarged view of part A in FIG. 1.

FIG. 2b is a partial enlarged view of part B in FIG. 1.

FIG. 3 is a schematic structural diagram of the canopy shown in FIG. 1, wherein two overhanging rods on the left side are extended out.

FIG. 4 is a schematic structural diagram of the canopy shown in FIG. 1, wherein all the overhanging rods are extended out.

FIG. 5 is a front view of the canopy shown in FIG. 4.

FIG. 6 is a schematic structural diagram of the canopy of FIG. 1 after folded.

FIG. 7 is a schematic partial diagram of the canopy shown in FIG. 1, wherein the overhanging rod is not extended.

FIG. 8 is a schematic diagram of the portion shown in FIG. 7, wherein the overhanging rod is extended out.

FIG. 9 is another schematic partial exploded diagram of the canopy shown in FIG. 1.

FIG. 10a is still another schematic partial structural diagram of the canopy shown in FIG. 1.

FIG. 10b is a schematic diagram of the portion shown in FIG. 10, wherein the cross rod is not shown.

FIG. 11 is a schematic diagram of a connecting process of a second end portion of the cross rod and a connecting rod.

FIG. 12 is a schematic structural diagram of the second end portion of the cross rod.

FIG. 13 is a schematic perspective diagram of a center lock and a hitch mechanism.

FIG. 14 is a sectional view of the center lock and the hitch mechanism.

FIG. 15 is a schematic assembled diagram of the center lock and an inner retractable unit.

FIGS. 16a and 16b are schematic perspective diagrams of two connecting pieces respectively.

FIG. 17 is a top view of another canopy of an embodiment of the present disclosure.

FIG. 18 is a schematic partial perspective diagram of the canopy shown in FIG. 17.

Reference numerals:

[0020]

1-leg; 10-leg body; 101-sliding sleeve; 102-locking hole; 11-fixed joint; 12-foot pad; 13-roller;

2-top frame; 21-outer retractable unit; 210-connecting rod assembly; 211-connecting rod; 211a-positioning protrusion; 212-third pivot; 22-inner retractable unit; 221-third top rod; 222-first top rod; 223-second top rod; 224-inclined rod; 23-center lock; 231-top cap; 232-bottom cap; 233-connecting portion;

3-overhanging rod; 30-fixed base; 301-first pivot; 302-second pivot;

4-cross rod; 41-clamping groove portion; 410-notch; 411-positioning groove;

5-support rod; 51-support base; 52-unlock button;

6-reinforcing rod unit; 621-third reinforcing rod; 621a-fourth pivot; 622-first reinforcing rod; 623-second reinforcing rod; 624-pivot base;

7-hitch mechanism; 70-hitch pin; 71-upper connecting piece; 71a-first inclined inner surface; 72-lower connecting piece; 72a-second inclined inner surface; 72b-limiting inner surface; 700-plug; 701-bending portion; 702-notch; 703-connecting rib.

DETAILED DESCRIPTION

[0021] Preferred embodiments of the present disclosure are described in detail below with reference to the accompanying drawings, such that the advantages and features of the present disclosure can be more readily understood by those skilled in the art. It should be noted here that the description of these embodiments is intended to assist in understanding of the present disclosure, but does not constitute a limitation of the present disclosure. Furthermore, the technical features involved in the embodiments of the present disclosure described below may be combined with each other as long as they do not conflict with each other.

[0022] Referring to FIGS. 1 to 12, a foldable canopy of the present embodiment has an unfolded state and a folded state, and includes a foldable canopy frame body 2; the canopy frame body 2 can be independently supported on the ground, and the canopy frame body 2 is covered with a cloth cover (not shown) for blocking the sun, keeping out wind and rain, or the like; a part (for example, an edge part) of the cloth cover, which is called surrounding cloth, can hang down to a side of the canopy frame body 2. As shown in FIGS. 1 and 3 to 5, the canopy frame body 2 includes a plurality of legs 1 extending in an up-down direction and a top frame connected to upper portions of the legs 1, and is supported on the ground by the legs 1, and most of the cloth cover covers the top frame. The canopy further includes a plurality of overhanging rods 3 having inner end portions and outer end portions, and the inner end portion of the overhanging rods 3 are rotatably connected to the legs 1, particularly by pivots. The number and positions of the overhanging rods 3 are in one-to-one correspondence with the number and positions of the legs 1; that is, the inner end portion of each overhanging rod 3 is rotatably connected to the respective leg 1, and the surrounding cloth is connected to the outer end portions of the overhanging rods 3, can be unfolded by the overhanging rods 3 to increase a sunshade area as an eave, and can also hang down to the side of the canopy along with folding of the overhanging rods 3 to be used as side surrounding cloth. Each overhanging rod 3 has a folded position and an unfolded position, and the outer end portion of the overhanging rod 3 is close to the leg 1 in the folded position and is offset from the leg 1 in the unfolded position. That is, the overhanging rod 3 has a folded position in which the overhanging rod is close to the leg 1 and an unfolded position in which the overhanging rod is unfolded relative to the leg 1. After the overhanging rod 3 is unfolded, the surrounding cloth is extended outwards, such that the sunshade area of the canopy can be increased. Further, the overhanging rod 3 on the left side extends leftwards in the unfolded position; that is, the outer end portion of the overhanging rod 3 is located on the left side of the leg 1; the overhanging rod 3 on the right side extends rightwards in the unfolded position; that is, the outer end portion of the overhanging rod 3 is located on the right side of the leg 1; therefore, the surrounding cloth on the left side and the right side can be unfolded, eave areas on the left side and the right side of the canopy are increased, and the sunshade areas on the left side and the right side are increased. When the overhanging rod 3 is in the folded position, the surrounding cloth hangs down and is located on the side of the canopy.

[0023] The top frame includes a plurality of foldable outer retractable units 21, and the outer retractable units 21 are connected between two adjacent legs 1. The canopy further includes a plurality of cross rods 4, and the number and positions of the plural cross rods 4 are in one-to-one correspondence with the number and the positions of the plural overhanging rods 3. As shown in FIGS. 7 to 12, each cross rod 4 has a first end portion rotatably connected to the overhanging rod 3 and a second end portion for being detachably connected with the outer retractable unit 21. The second end portion of the cross rod 4 is disconnected from the outer retractable unit 21 when the overhanging rod 3 is in the folded position, and the second end portion of the cross rod 4 is connected with the outer retractable unit 21 when the overhanging rod 3 is in the unfolded position. In the process that the canopy frame body 2 is converted from the unfolded state to the folded state, the second end portion of the cross rod 4 is disconnected from the outer

retractable unit 21, and the overhanging rod 3 is converted from the unfolded position to the folded position. The second end portion of the cross rod 4 is detachably connected with a rod of the outer retractable unit 21 and configured to be automatically separated from the outer retractable unit 21 by a force from the overhanging rod 3 when the outer retractable unit 21 is folded, an implementation of which is described in detail below.

[0024] It should also be noted that in the present embodiment, the overhanging rod 3 is directly and rotatably connected to the leg 1 by the pivot; in some other embodiments, the overhanging rod 3 can be indirectly and rotatably connected to the leg 1 by other components, such as a sliding sleeve, a connecting cap, or the like, on the leg 1. Furthermore, the overhanging rod 3 can be detachably connected with the leg, for example, be detachably inserted in the leg.

[0025] The outer retractable unit 21 includes a connecting rod 211 which can be rotated downwards when the canopy frame body 2 is folded; the second end portion of the cross rod 4 is provided with a clamping groove portion 41 capable of being clamped on the connecting rod 211, and the clamping groove portion 41 has a notch 410 facing downwards, as shown in FIG. 12. A clamping groove formed by the clamping groove portion 41 preferably extends upwards from a lower surface of the clamping groove portion 41, and a profile of the clamping groove is approximately in an inverted U shape in a cross section of the clamping groove portion 41 perpendicular to a length direction of the connecting rod 211. When the canopy frame body 2 is folded, the connecting rod 211 may be rotated downwards to be disconnected from the clamping groove of the clamping groove portion 41, and the cross rod 4 and the outer retractable unit 21 are disconnected, thus avoiding that since the overhanging rod 3 is forgotten to be folded, the canopy frame body 2 cannot be folded, or the overhanging rod 3 and the rod piece of the canopy frame body 2 are damaged. In the present embodiment, the overhanging rods 3 are not unfolded in a diagonal direction of the canopy; as shown in FIGS. 3 and 4, each of the overhanging rods 3 extends in a length direction of a first outer retractable unit 21 (for example, the outer retractable unit located on the front side); that is, the overhanging rod 3 extends in substantially the same direction as the first outer retractable unit 21 in a top view. The cross rod 4 connected with the overhanging rod 3 is detachably connected with a second outer retractable unit 21, and the second outer retractable unit 21 intersects with the above-mentioned first outer retractable unit 21, for example, the outer retractable unit located on the left side.

[0026] As shown in FIGS. 10b to 12, a positioning protrusion 211a is formed on the connecting rod 211 fitted with the cross rod 4, and a positioning groove 411 fitted with the positioning protrusion 211a is provided in the clamping groove portion 41 to restrict sliding of the clamping groove portion 41 in the length direction of the connecting rod 211. The positioning groove 411 is communicated with the clamping groove formed by the clamping groove portion 41 and extends upwards from the lower surface of the clamping groove portion 41, and the positioning protrusion 211a enters the positioning groove 411 when the clamping groove portion 41 is clamped on the connecting rod 211; the positioning groove 411 has two opposite limiting surfaces, the whole limiting surfaces are not parallel to the length direction of the connecting rod 211, and the positioning protrusion 211a is located between the two limiting surfaces to prevent the clamping groove portion 41 from moving back and forth on the connecting rod 211. The positioning protrusion 211a specifically includes a pin, a pop-rivet, or a rivet fixed on the connecting rod 211; still further, the positioning protrusion 211a is located at a pivot position of the connecting rod 211 and another rod piece (preferably, another rod piece of an eave frame), and may be a part of or provided on the pivot for pivoting the connecting rod 211 and the other rod piece. In the present embodiment, each cross rod 4 is a single rod; while in some other embodiments, the cross rod 4 may be formed by a plurality of rod pieces.

[0027] The canopy further includes a plurality of support rods 5 with first end portions and second end portions, and the number and positions of the plurality of support rods 5 are in one-to-one correspondence with the number and the positions of the overhanging rods 3. As shown in FIGS. 2b and 7 to 12, the first end portion of each support rod 5 is rotatably connected to the leg 1 in a mode of being slidable in the up-down direction, and the second end portion is rotatably connected to the overhanging rod 3. Specifically, the first end portion of the support rod 5 is rotatably connected to a support base 51, and the support base 51 is connected to the leg 1 in a mode of being slidable in the up-down direction. The support base 51 is preferably a sliding sleeve which is fitted on the leg 1 in a mode of being slidable in the up-down direction, and the support rod 5 has a lower end portion pivotally connected to the sliding sleeve and an upper end portion pivotally connected to the overhanging rod 3. An overhanging locking mechanism is provided between the support base 51 and the leg 1, and the overhanging locking mechanism locks the support base 51 and the leg 1 when the overhanging rod 3 is in the unfolded position. The overhanging locking mechanism can be of a known structure; for example, the support base 51 is provided with a movable locking piece (not shown), the leg 1 is provided with a locking hole 102 fitted with the locking piece, and the locking piece is detachably inserted into the locking hole 102. In the unfolded position, the locking piece on the support base 51 is inserted into the locking hole 102 to lock the overhanging rod 3 in the unfolded position, such that the overhanging rod is stably unfolded; when the state is required to be converted to the folded position, an unlock button 52 on the support base 51 is pressed to separate the locking piece from the locking hole 102, the support base 51 slides down to a lower portion of the leg 1 to drive the overhanging rod 3 to

be folded until the outer end portion of the overhanging rod and the leg 1 are drawn close to each other, and meanwhile, the first end portion (lower end portion) of the support rod 5 and the lower end portion of the leg 1 are also drawn close to each other.

[0028] Further, a fixed base 30 is provided between the inner end portion and the outer end portion of the overhanging rod 3, and the fixed base 30 is approximately located in the middle of the overhanging rod 3. The first end portion of the cross rod 4 is rotatably connected to the fixed base 30 by a first pivot 301, and the second end portion (upper end portion) of the support rod 5 is rotatably connected to the fixed base 30 by a second pivot 302. An included angle formed between an axis of the first pivot 301 and/or the second pivot 302 and a horizontal plane is smaller than 10 degrees when the overhanging rod 3 is in the folded position. Specifically, when the overhanging rod 3 is in the folded position, the axes of the first pivot 301 and the second pivot 302 are preferably parallel to the horizontal plane or only inclined by a small angle, and the axis of the pivot connecting the overhanging rod 3 and the leg 1 is also preferably parallel to the horizontal plane or only inclined by a small angle, such that the overhanging rod 3 and the cross rod 4 can automatically fall down under the action of gravity and hang down to the side of the leg 1. Further, when the overhanging rod 3 is in the folded position, the support rod 5 is drawn close to a front side or a rear side of the overhanging rod 3; moreover, the support rod 5 is completely shielded by the overhanging rod 3 when viewed from the front side or the rear side.

[0029] As shown in FIGS. 2b and 7 to 9, the leg 1 includes a leg body 10 extending in the up-down direction, a fixed joint 11 fixed to an upper end portion of the leg body 10, and a foot pad 12 fixed to a lower end portion of the leg body 10; the inner end portion of the overhanging rod 3 is pivotally connected to the fixed joint 11, the support base 51 is slidably fitted on the leg body 10, and the locking hole 102 is formed in the leg body 10. The foot pad 12 provides a large contact area with the ground, and rollers 13 are provided on the foot pads 12 of several legs 1 (for example, the two legs 1 on the right side) to facilitate transportation of the canopy. Hereinafter, the "upper end portion of the leg 1" and the "lower end portion of the leg 1" refer to the fixed joint 11 and the foot pad 12 respectively, unless otherwise specified. Further, some or all of the foot pads 12 are provided with insertion holes; after the canopy is folded, the canopy can be covered with a protective bag with an opened lower end, and the lower end of the protective bag is connected to the insertion hole by a connecting assembly; for example, the protective bag is connected to the canopy by inserting a bolt on a connecting band into the insertion hole of the foot pad 12.

[0030] As shown in FIGS. 1 and 3 to 5, the top frame in the present embodiment includes a plurality of foldable outer retractable units 21 and a plurality of foldable inner retractable units 22. The outer retractable units 21 are connected between two adjacent legs 1; the number of the legs 1 is four, and each of the front, rear, left and right sides of the canopy is provided with one outer retractable unit 21. Each outer retractable unit 21 includes at least one connecting rod assembly 210 rotatably connected between the adjacent legs 1, each connecting rod assembly 210 includes two connecting rods 211 capable of being relatively unfolded and closed, and middles of the two connecting rods 211 are rotatably connected by a third pivot 212 to form a cross-shaped scissor-like structure. The upper end portion (specifically, the fixed joint 11) of the leg 1 is pivotally connected with an end portion of one connecting rod 211 in the connecting rod assembly 210 connected therewith; the leg 1 (specifically, the leg body 10) is further provided with a sliding sleeve 101, the sliding sleeve 101 is fitted on the leg 1 in a mode of being slidable in the up-down direction, and the sliding sleeve 101 is pivotally connected with an end portion of the other connecting rod 211 in the connecting rod assembly 210. During folding, the sliding sleeve 101 is slid downwards, and the two connecting rods 211 of the connecting rod assembly 210 get close to each other in a lateral direction, such that the legs 1 are close to each other, thereby reducing sizes of the canopy in front-rear and left-right directions, as shown in FIG. 6. Specifically, in the present embodiment, each outer retractable unit 21 is formed by three connecting rod assemblies 210 which are rotatably connected in sequence. The above-mentioned clamping groove portion 41 is preferably detachably connected with the upper end portion of the connecting rod 211 connected with the upper end portion of the leg 1, and the above-mentioned positioning protrusion 211a is also formed on the upper end portion of the connecting rod 211.

[0031] Each inner retractable unit 22 includes a first top rod 222 and a third top rod 221, one end portion of the first top rod is rotatably connected with one end portion of the third top rod, the other end portion of the third top rod 221 is rotatably connected to the upper end portion of the leg 1, and the other end portion of the first top rod 222 of each inner retractable unit 22 is rotatably connected to a center lock 23. The center lock 23 includes a top cap 231 and a bottom cap 232 which can be locked to or separated from each other, and the other end portion of the first top rod 222 is rotatably connected to the top cap 231; each inner retractable unit 22 further includes a second top rod 223, one end portion of the second top rod 223 is rotatably connected to the first top rod 222, and the other end portion is rotatably connected to the bottom cap 232. Each inner retractable unit 22 further includes an inclined rod 224, an upper end portion of the inclined rod 224 is rotatably connected to the third top rod 221, and a lower end portion is rotatably connected to the sliding sleeve 101 on the leg 1. After the top cap 231 and the bottom cap 232 are locked, the canopy frame body 2 is locked in the unfolded state by the center lock 23; when the top cap 231 and the bottom cap 232 are unlocked, the inclined rod 224 moves downwards along with the sliding sleeve 101,

and pulls the inner retractable unit 22 to be folded; that is, the third top rod 221 and the first top rod 222 rotate downwards, such that the inner end portion of the third top rod 221 and the outer end portion of the first top rod 222 are drawn close to the lower end portion of the leg 1, the top cap 231 and the upper end portion of the leg 1 are drawn close to each other, and the lower end portion of the second top rod 223, the bottom cap 232 and the outer end portion of the first top rod 222 are drawn close to each other.

[0032] The canopy frame body 2 further includes a reinforcing rod unit 6 connected between one of the outer retractable units 21 and the center lock 23. Specifically, the reinforcing rod unit 6 includes a third reinforcing rod 621 and a first reinforcing rod 622, one end portion of the third reinforcing rod is rotatably connected with one end portion of the first reinforcing rod, the other end portion of the third reinforcing rod 621 is rotatably connected to the outer retractable unit, and the other end portion of the third reinforcing rod 622 is rotatably connected to the center lock 23, specifically, the top cap 231. The reinforcing rod unit 6 further includes a second reinforcing rod 623, one end portion of the second reinforcing rod 623 is rotatably connected to the first reinforcing rod 622, and the other end portion is rotatably connected to the bottom cap 232. In the present embodiment, the other end portion of the third reinforcing rod 621 is rotatably connected to a cross connection junction of the middle connecting rod assembly 210. Specifically, the other end portion of the third reinforcing rod 621 is rotatably connected to a pivot base 624 by a fourth pivot 621a, the pivot base 624 is fixedly connected to the third pivot 212, and an axis of the fourth pivot 621a and an axis of the third pivot 212 form an included angle greater than zero and less than 180 degrees, and preferably are perpendicular to each other. The canopy of the present embodiment has two reinforcing rod units 6 provided on left and right sides of the top frame respectively.

[0033] It should also be noted that, in the present embodiment, the inner end portion of each inner retractable unit 22 and the inner end portion of the reinforcing rod unit 6 are rotatably connected to the center lock 23 by a hitch mechanism 7, and the hitch mechanism 7 includes a hitch pin 70 and a connecting piece (specifically, an upper connecting piece 71 and a lower connecting piece 72 described below) which are fitted with each other; a hitch pin groove for accommodating the hitch pin 70 is formed in the connecting piece, the hitch pin groove has a notch 702 for the hitch pin 71 to enter, and the notch 702 is configured such that the hitch pin 70 enters the hitch pin groove in a direction intersecting with a center line thereof. That is, unlike a traditional screw connecting mode (a screw is inserted into a screw hole of the rod piece substantially along a center line thereof), in the present embodiment, the hitch pin 70 enters the hitch pin groove in the connecting piece from an outer circumferential side of the connecting piece. Specifically, the connecting piece is substantially a hook-like component, and the connecting piece is hooked by the hitch pin 70, as shown in FIGS. 13 to 16b. Each of the top cap 231 and the bottom cap 232 of the center lock 23 has a plurality of protruding connecting portions 233 arranged at intervals along a perimetric direction thereof, and the top cap 231 and the bottom cap 232 generally have petal shapes. The opposite surfaces of every two adjacent connecting portions 233 are provided with the hitch pins 70 respectively, the connecting piece is located between the two adjacent connecting portions 233, and each connecting piece is connected and fitted with two hitch pins 70. The connecting pieces includes a plug 700 connected with or integrally formed with the inner end portion of the inner retractable unit 22 or the reinforcing rod unit 6 and a hook portion 701 extending in a bending mode; the plug 700 is specifically inserted into an end portion of the rod piece (such as the inner end portion of the first reinforcing rod 622, the inner end portion of the second reinforcing rod 623, the inner end portion of the first top rod 222 or the inner end portion of the second top rod 223) and is fastened and connected thereto by a screw; one end of the hook portion 701 and the plug 700 are fixedly connected or integrally formed, a space between the hook portion 701 and the plug 700 is the above hitch pin groove, and the notch 702 for the hitch pin 70 to enter the hook portion 701 is formed between the other end of the hook portion 701 and the plug 700. A connecting rib 703 is connected between the other end of the hook portion 701 and the plug 700, and two notches 702 are formed in two opposite sides of the connecting rib 703 respectively, such that two hitch pins 70 can be clamped in the notches. A width of the connecting rib 703 is smaller than a distance between two adjacent hitch pins 70, such that the connecting rib can pass between the two hitch pins 70.

[0034] Each of the top cap 231 and the bottom cap 232 is provided with the hitch pin 70, and the connecting pieces include an upper connecting piece 71 hooked on the hitch pin 70 on the top cap 231 and a lower connecting piece 72 hooked on the hitch pin 70 on the bottom cap 232. Each of the upper connecting piece 71 and the lower connecting piece 72 has the plug 700, the hook portion 701 and the notch 702, and the difference is only that inner surfaces of the hook portions 701 are slightly different. As shown in FIGS. 14 and 16a, the notch 702 of the upper connecting piece 71 faces upwards, the hook portion 701 of the upper connecting piece 71 has a first inclined inner surface 71a opposite to the plug 700 thereof, and the first inclined inner surface 71a is substantially opposite and parallel to a surface of the plug 700. Referring to FIGS. 4 and 16b, the notch 702 of the lower connecting piece 72 faces upwards, the hook portion 701 of the lower connecting piece 72 has a second inclined inner surface 72a opposite to the plug 700 thereof and a limiting inner surface 72b opposite to the hitch pin 70 located therein, the limiting inner surface 72b is located between the second inclined inner surface 72a and the notch 702, and the limiting surface is located

above the hitch pin 70 and directly faces the hitch pin 70; specifically, an edge of the limiting surface close to the notch 702 is lower than an edge of the limiting surface close to the second inclined inner surface 72a, such that the hitch pin 70 is prevented from sliding out of the notch 702 of the lower connecting piece 72 during turning and folding of the rod piece. Specifically, the hitch pin 70 is integrally formed on the top cap 231 and the bottom cap 232.

[0035] Specifically, the inner end portion of the first top rod 222 of each inner retractable unit 22 is fixedly arranged with one upper connecting piece 71, and the upper connecting pieces 71 are hung on the hitch pins 70 of the top cap 231 to be rotatably connected with the top cap 231; the inner end portion of the second top rod 223 of each inner retractable unit 22 is fixedly arranged with one lower connecting piece 72, and the low connecting pieces 72 are hung on the hitch pins 70 of the bottom cap 232 to be rotatably connected with the bottom cap 232. The inner end portion of the first reinforcing rod 622 of each reinforcing rod unit 6 is fixedly arranged with one upper connecting piece 71, and the upper connecting pieces 71 are hung on the hitch pins 70 of the top cap 231 to be rotatably connected with the top cap 231; the inner end portion of the second reinforcing rod 623 of each reinforcing rod unit 6 is fixedly arranged with one lower connecting piece 72, and the low connecting pieces 72 are hung on the hitch pins 70 of the bottom cap 232 to be rotatably connected with the bottom cap 232. During assembly, the hitch pins 70 are slid into the connecting pieces from the notches 702, the rod pieces are then pulled downwards, the hitch pins 70 enter the connecting pieces, and under self-weight of the rods and the action of other rods, the connecting pieces are kept in a state of being hung on the hitch pins 70, which ensures that the inner retractable units 22 are effectively connected with the center lock 23, the reinforcing rod units 6 are effectively connected with the center lock 23, and separation is avoided during normal use; compared with a traditional screw connection mode, assembly is convenient and a cost is low.

[0036] In the canopy shown in FIGS. 1 and 2 to 4, the reinforcing rod units 6 are provided only between the outer retractable units 21 on the left and right sides and the center lock 23. In the canopy shown in FIGS. 17 to 18, the reinforcing rod units 6 are provided between each outer retractable unit 21 and the center lock 23; the first reinforcing rod 622 of each reinforcing rod unit 6 is connected to the top cap 231 of the center lock 23 through one hitch mechanism, and the second reinforcing rod 623 of each reinforcing rod unit 6 is connected to the bottom cap 232 of the center lock 23 through one hitch mechanism; the first top rod 222 of each inner retractable unit 22 is connected to the top cap 231 of the center lock 23 through one hitch mechanism, and the second top rod 223 of each inner retractable unit 22 is connected to the bottom cap 232 of the center lock 23 through one hitch mechanism.

[0037] A using method of the canopy includes: unfolding the canopy frame body 2, locking the top cap 231 and the bottom cap 232 to each other after unfolding to stably unfold the canopy, as shown in FIG. 1, and unfolding the overhanging rods 3 on one side as required, as shown in FIG. 3; or unfolding the overhanging rods 3 on both sides, as shown in FIGS. 4 and 5. A specific process of unfolding the overhanging rod 3 is as follows: the overhanging rod 3 is lifted, the support base 51 moves upwards therewith, the second end portion of the cross rod 4 is clamped to the positioning protrusion 211a on the connecting rod 211, and the overhanging locking mechanism performs locking to enable the overhanging rod 3 to be stably in the unfolded position. A specific process of folding the overhanging rod 3 is as follows: the overhanging locking mechanism performs unlocking, the second end portion of the cross rod 4 is disconnected from the connecting rod 211, the support base 51 slides downwards under the action of the gravity, and the overhanging rod 3 and the cross rod 4 automatically drop to the side of the leg body 10. When the canopy is required to be folded, the overhanging rod 3 can be folded in advance; if the overhanging rod is forgotten to be folded, in the process of folding the canopy frame body 2, the cross rod 4 can be automatically disconnected from the connecting rod 211 and released under the pressing action of an external force, and the process is specifically as follows: the top cap 231 and the bottom cap 232 are unlocked, the sliding sleeve 101 on the leg body 10 moves downwards, the connecting rods 211 of the outer retractable unit 21 rotate to approach each other, and especially, the connecting rod 211 connected with the cross rod 4 rotates downwards to be separated from the notch 410 on the clamping groove portion 41, and the canopy frame body 2 is normally folded.

[0038] After the canopy is unfolded, the overhanging rod 3 can be flexibly unfolded or folded as desired, and the overhanging rod can be quickly and conveniently unfolded and folded; the cross rod 4 can strengthen the overhanging rod 3 after the overhanging rod 3 is unfolded, and good strength is realized; particularly, when the canopy is folded, if the overhanging rod 3 is forgotten to be folded, the second end portion of the cross rod 4 can be automatically disconnected from the connecting rod 211 of the outer retractable unit 21 under the action of the external force along with the folding of the outer retractable unit 21, thus avoiding accident breaking of the overhanging rod 3 or damage to the structure of the canopy frame body 2 caused when the overhanging rod 3 is forgotten to be folded. Furthermore, the foldable reinforcing rod unit 6 is provided between the outer retractable unit 21 and the center lock 23, such that when the canopy frame body 2 is unfolded and folded, a pushing force applied by the cross rod 4 to the outer retractable unit 21 can be offset or reduced, thus avoiding the problem that the outer retractable unit 21 is recessed and deformed due to the pushing force of the cross rod 4. The canopy frame body 2 is locked by the center lock 23 and

can be quickly unfolded and folded.

[0039] As used in the specification and the appended claims, the terms "includes" and "comprises" only suggest the inclusion of the explicitly recited steps and elements, these steps and elements do not constitute an exclusive list, and the method or device may include other steps or elements. The term "and/or" used herein includes any combination of one or more related listed items.

[0040] The indefinite articles "a" and "an" preceding an element or component herein are intended to describe without limitation the number of instances (i.e., occurrences) of the element or component, unless the context clearly indicates. Therefore, "a" and "an" are to be understood as including one or at least one, and the singular form of the element or component also includes the plural form.

[0041] It should be noted that, unless otherwise specified, when a feature is referred to as being "fixed" or "connected" to another feature, it can be directly or indirectly fixed or connected to the other feature. Furthermore, the descriptions "upper", "lower", "left", "right", or the like, used in the present disclosure are only given with respect to the positional relationship of the components of the present disclosure in the drawings.

[0042] It will be further understood that the terms "first", "second", or the like, are used to describe various information, but the information should not be limited by these terms. These terms are only used to distinguish information of the same type, and do not indicate a particular order or degree of importance. Indeed, the expressions "first", "second", or the like, are used interchangeably throughout. For example, first information may also be referred to as second information, and similarly, second information may also be referred to as first information, without departing from the scope of the present disclosure.

[0043] The above-mentioned embodiments are merely illustrative of the technical concepts and features of the present disclosure, and are preferred embodiments, which are intended to enable those skilled in the art to understand the contents of the present disclosure and implement the present disclosure, and not to limit the protective scope of the present disclosure. All equivalent changes or modifications made in accordance with the principles of the present disclosure are intended to be included within the protective scope of the present disclosure.

Claims

1. A canopy, comprising:

at least three legs;
a plurality of outer retractable units, each outer retractable unit being connected between two adjacent legs of the at least three legs;
a plurality of inner retractable units, each inner retractable unit being connected to one of the at least three legs and having an inner end portion, and the outer retractable units and the inner retractable units constituting a top frame of the canopy; and
a center lock configured to lock the canopy in an unfolded state after locking, and allow the canopy to be folded into a folded state after unlocking, the inner end portion of each inner retractable unit being rotatably connected to the center lock;
is **characterized in that**, the canopy further comprises:
at least one reinforcing rod unit having an outer end portion and an inner end portion, the outer end portion of the reinforcing rod unit being rotatably connected to one of the plurality of outer retractable units, and the inner end portion of the reinforcing rod unit being rotatably connected to the center lock.

2. The canopy of claim 1, is **characterized in that**, the inner end portion of each inner retractable unit and/or the inner end portion of the reinforcing rod unit are/is rotatably connected to the center lock by a hitch mechanism, the hitch mechanism comprises a hitch pin and a connecting piece which are fitted with each other, a hitch pin groove for accommodating the hitch pin is formed in the connecting piece, the hitch pin groove has a notch for the hitch pin to enter, and the notch is configured to allow the hitch pin to enter the hitch pin groove in a direction intersecting with a center line thereof.

3. The canopy of claim 2, is **characterized in that**, the center lock has a plurality of connecting portions arranged at intervals along a perimetric direction of the center lock, opposite surfaces of two adjacent connecting portions of the plurality of connecting portions are provided with hitch pins respectively, the connecting piece is located between the two adjacent connecting portions, and the connecting piece accommodates two hitch pins.

4. The canopy of claim 3, is **characterized in that**, the connecting piece comprises a plug connected with or integrally formed with the inner end portion of each inner retractable unit or the reinforcing rod unit and a hook portion extending in a bending mode, one end of the hook portion and the plug are fixedly connected or integrally formed, the hitch pin groove is formed between the hook portion and the plug, and the notch is formed between the other end of the hook portion and the plug.

5. The canopy of claim 4, is **characterized in that**, a connecting rib is connected between the other end of

the hook portion and the plug, and two notches are provided on two opposite sides of the connecting rib respectively.

6. The canopy of claim 4, is **characterized in that**, the center lock comprises a top cap and a bottom cap which are locked or unlocked respect to each other, the top cap and the bottom cap are provided with hitch pins respectively, and the connecting piece comprises an upper connecting piece connected to the hitch pin on the top cap and a lower connecting piece connected to the hitch pin on the bottom cap.

7. The canopy of claim 6, is **characterized in that**, the hook portion of the upper connecting piece has a first inclined inner surface opposite to the plug thereof.

8. The canopy of claim 6 or 7, is **characterized in that**, the notch of the hitch pin groove faces upwards, the hook portion of the lower connecting piece has a second inclined inner surface opposite to the plug thereof and a limiting inner surface opposite to the hitch pin located therein, the limiting inner surface is located between the second inclined inner surface and the notch, and an edge of the limiting inner surface close to the notch is lower than an edge of the limiting inner surface close to the second inclined inner surface.

9. The canopy of claim 6, is **characterized in that**, the reinforcing rod unit comprises a first reinforcing rod and a second reinforcing rod which are rotatably connected, an end portion of the first reinforcing rod is provided with the upper connecting piece and rotatably connected to the top cap through the upper connecting piece, and an end portion of the second reinforcing rod is provided with the lower connecting piece and rotatably connected to the bottom cap through the lower connecting piece.

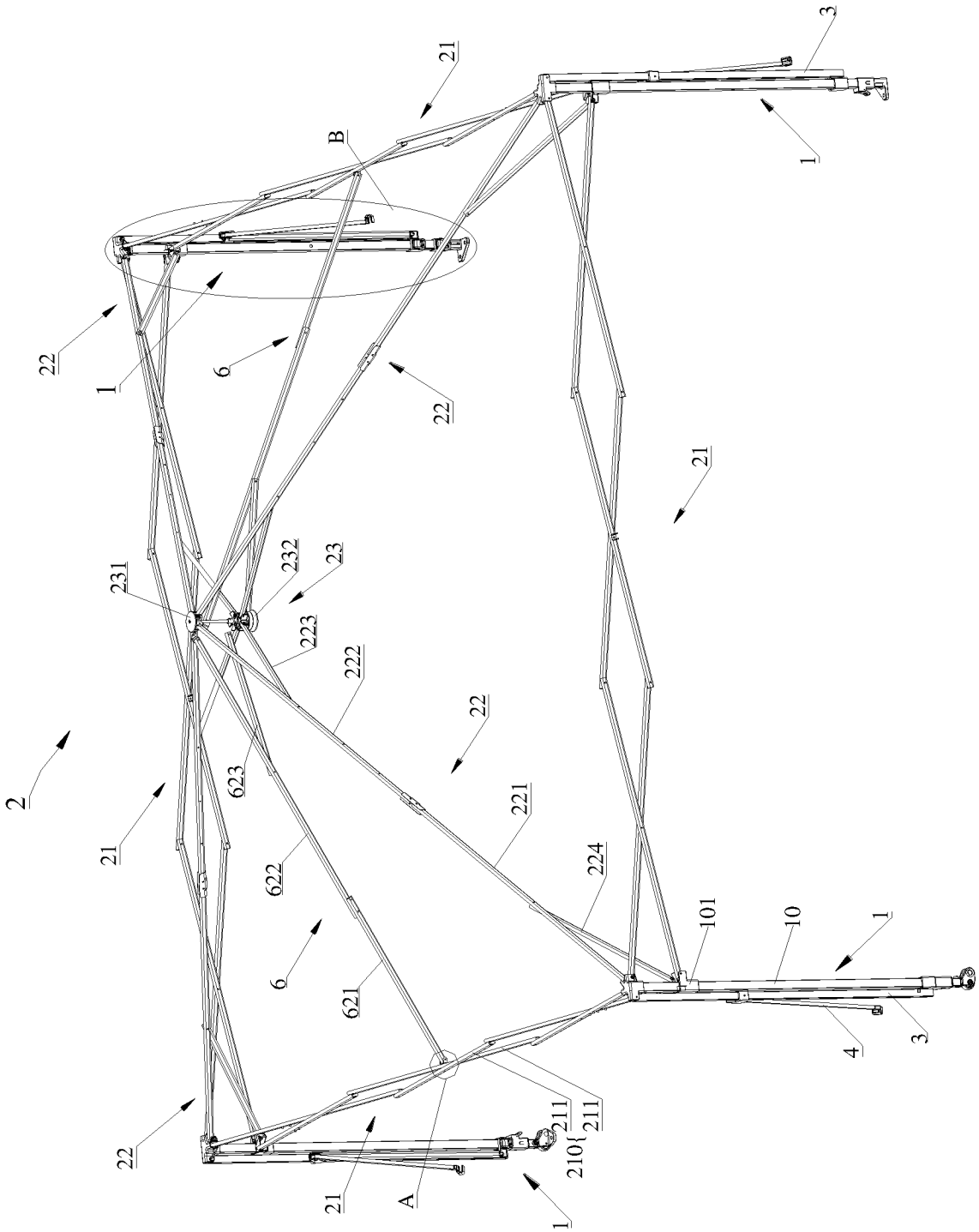
10. The canopy of claim 6 or 9, is **characterized in that**, each inner retractable unit comprises a first top rod and a second top rod which are rotatably connected, an end portion of the first top rod is provided with the upper connecting piece and rotatably connected to the top cap through the upper connecting piece, and an end portion of the second top rod is provided with the lower connecting piece and rotatably connected to the bottom cap through the lower connecting piece.

11. The canopy of claim 10, is **characterized in that**, the reinforcing rod unit further comprises a third reinforcing rod having an end portion rotatably connected to the other end portion of the first reinforcing rod, each outer retractable unit comprises at least one connecting rod assembly rotatably connected between the legs, the connecting rod assembly comprises a first connecting rod and a second connecting rod which are capable of being relatively unfolded and closed, middles of the first connecting rod and the second connecting rod are rotatably connected by a pivot, the other end portion of the third reinforcing rod is rotatably connected to a pivot base, and the pivot base is connected to the pivot.

12. The canopy of any one of the preceding claims, is **characterized in that**, between each outer retractable unit and the center lock, one reinforcing rod unit is arranged.

13. The canopy of any one of the preceding claims, is **characterized in that**, the canopy further comprises an overhanging rod, the overhanging rod has an unfolded position and a folded position after the canopy is unfolded, and when the overhanging rod is in the unfolded position, an inner end portion of the overhanging rod is connected to one of the legs, and an outer end portion of the overhanging rod is offset from the leg, and when the overhanging rod is in the folded position, the outer end portion of the overhanging rod and the leg are drawn close to each other.

14. The canopy of claim 13, is **characterized in that**, the canopy further comprises a cross rod, the cross rod has a first end portion rotatably connected to the overhanging rod and a second end portion for being detachably connected with one of the outer retractable units, the second end portion of the cross rod is disconnected from the outer retractable unit when the overhanging rod is in the unfolded position, and the second end portion of the cross rod is connected with the outer retractable unit when the overhanging rod is in the folded position; during the canopy being converted from an unfolded state to a folded state, the second end portion of the cross rod is disconnected from the outer retractable unit, and the overhanging rod is converted from the folded position to the unfolded position.


3
21
B
1
22
1
6
22
21
231
232
23
223
222
22
2
623
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221
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101
10
1
6
621
4
3
22
211
211
210
21
A
1

FIG. 1

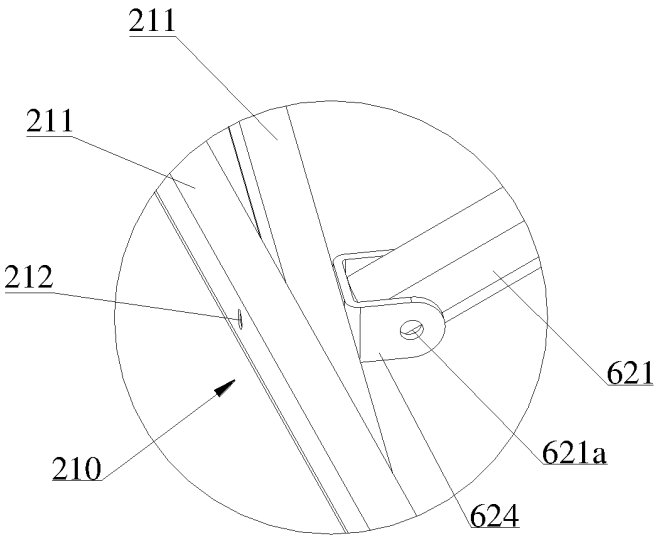

FIG. 2a

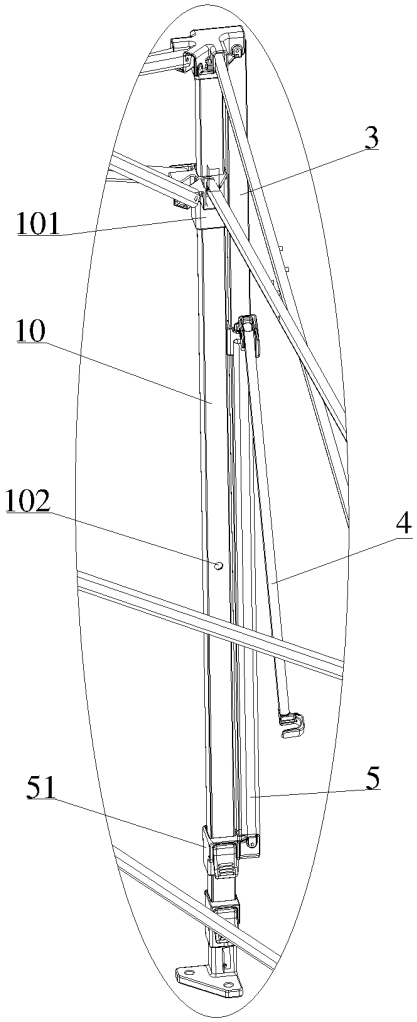

FIG. 2b

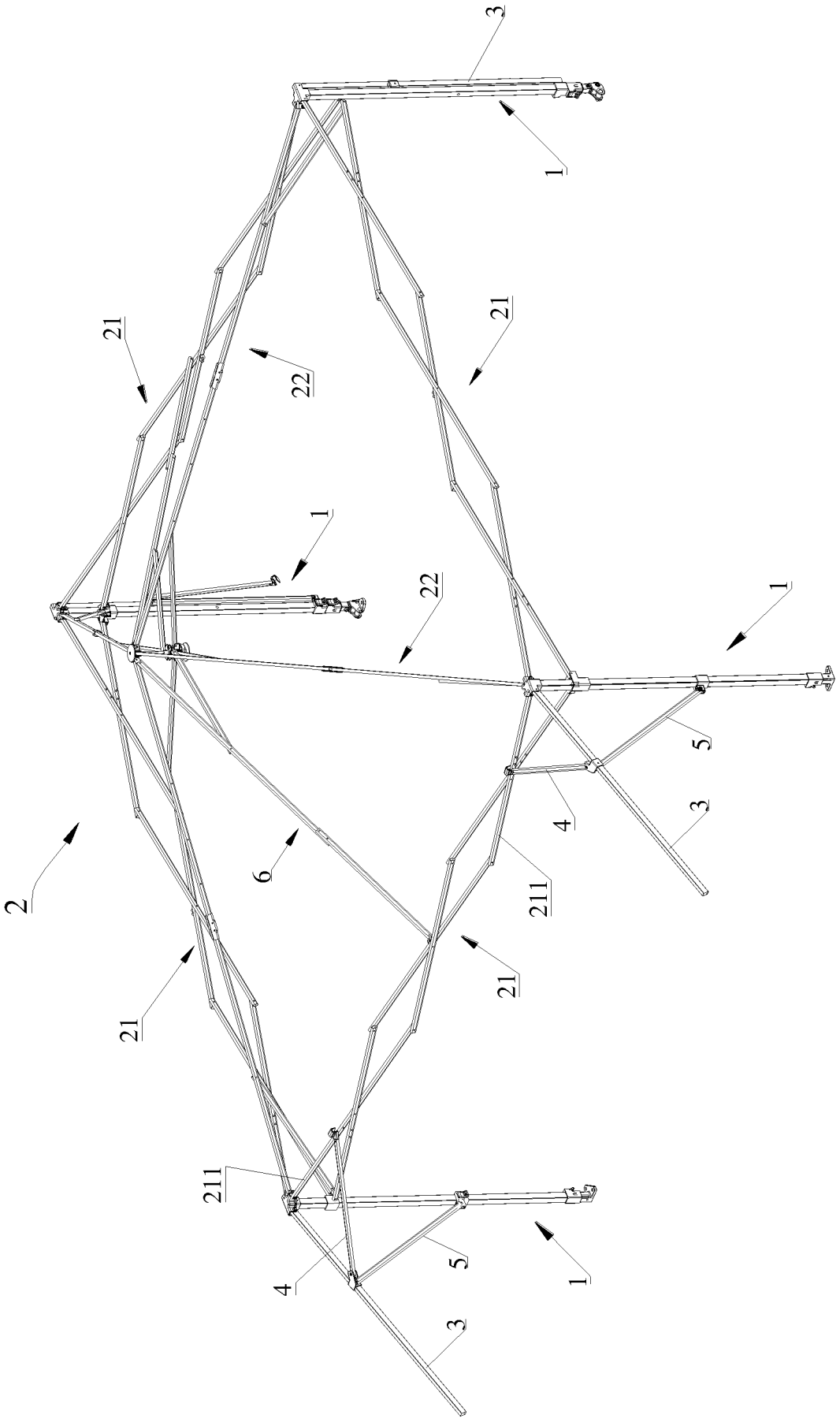

FIG. 3

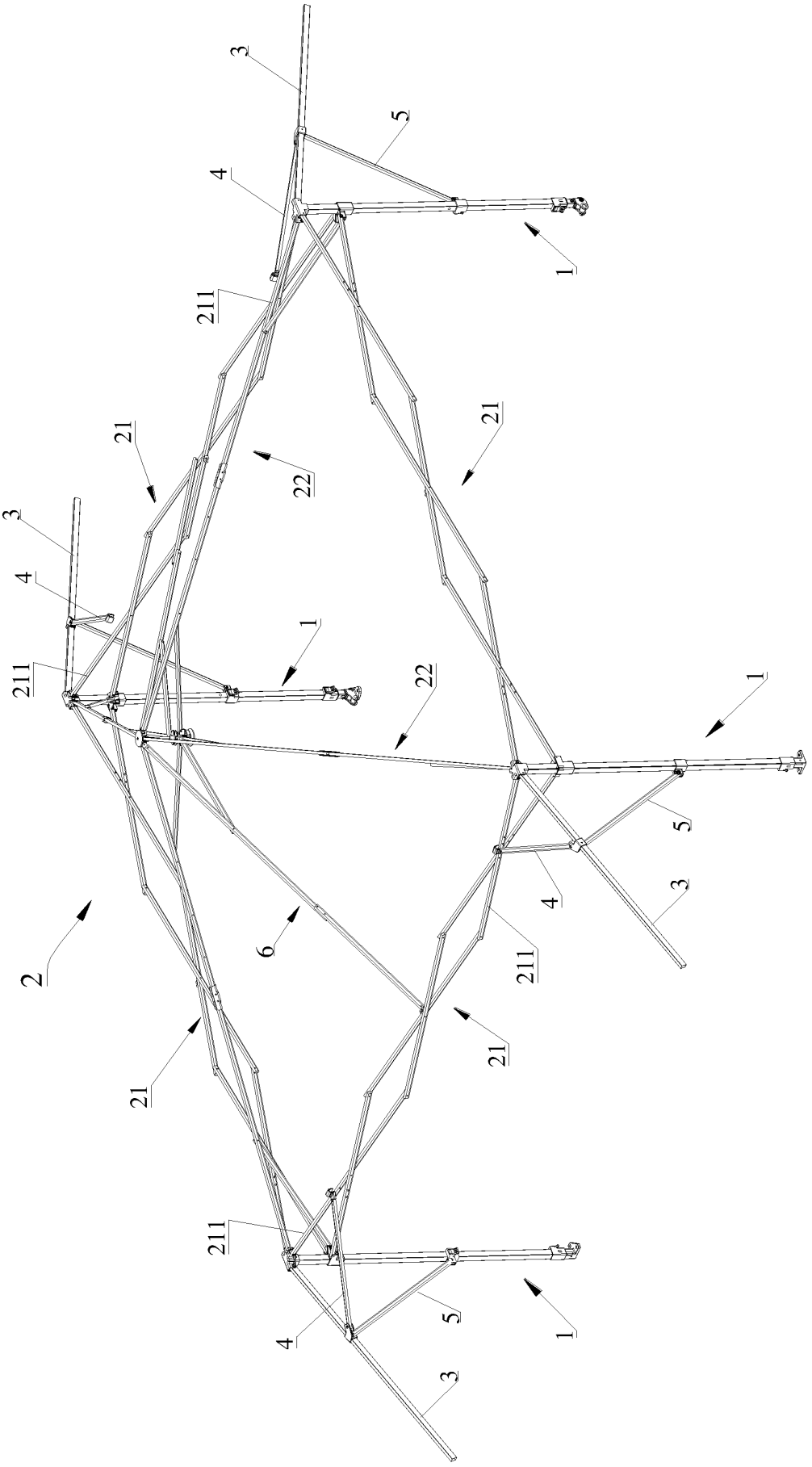

FIG. 4

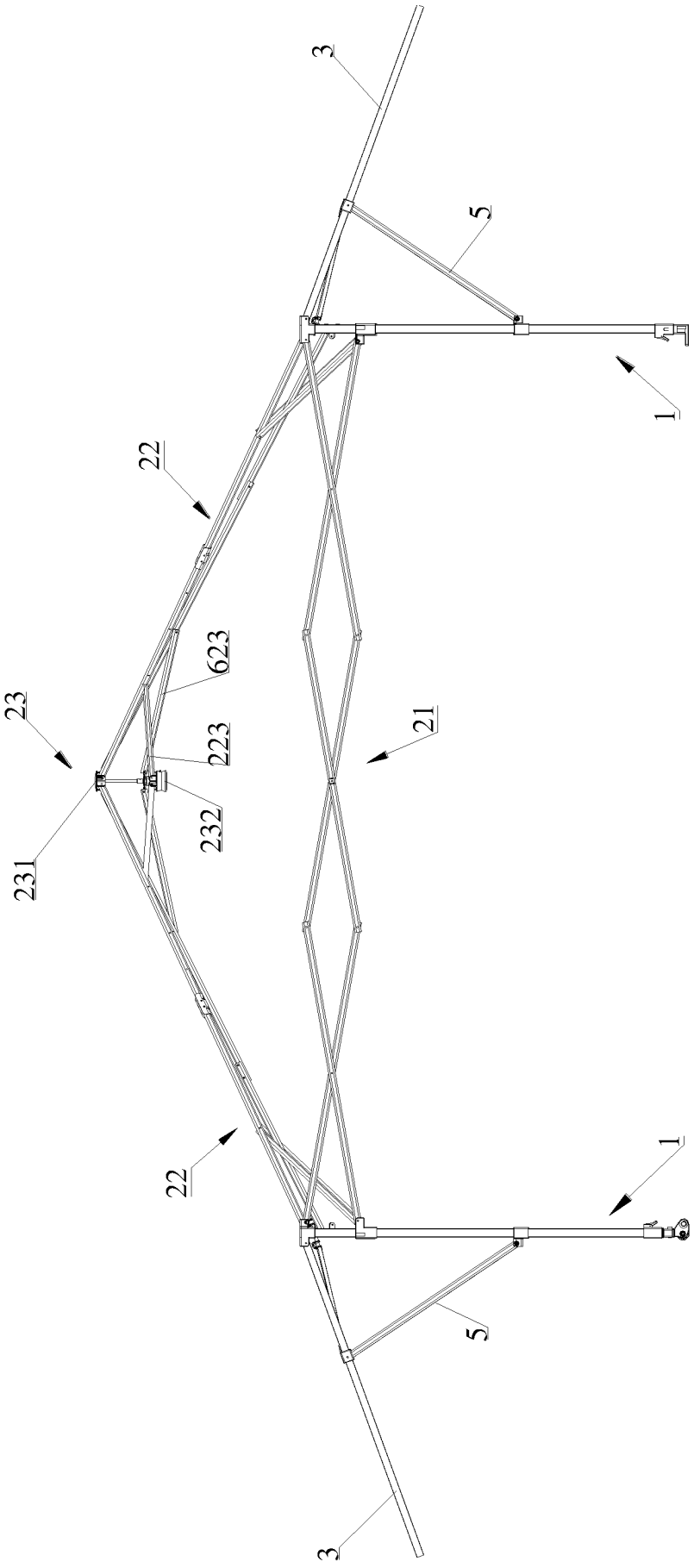

FIG. 5

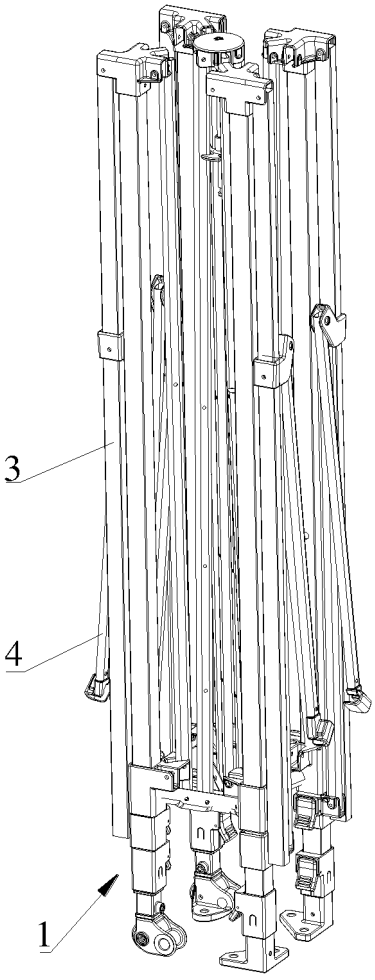

FIG. 6

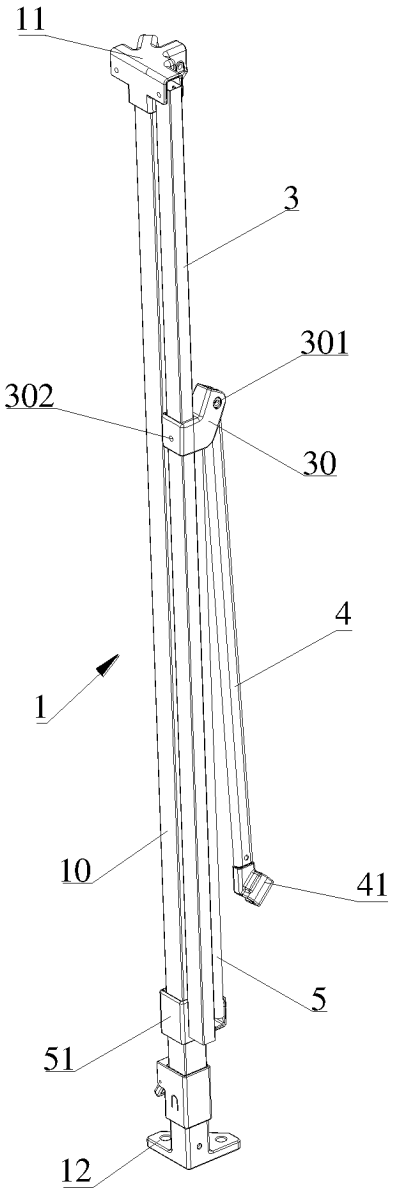

FIG. 7

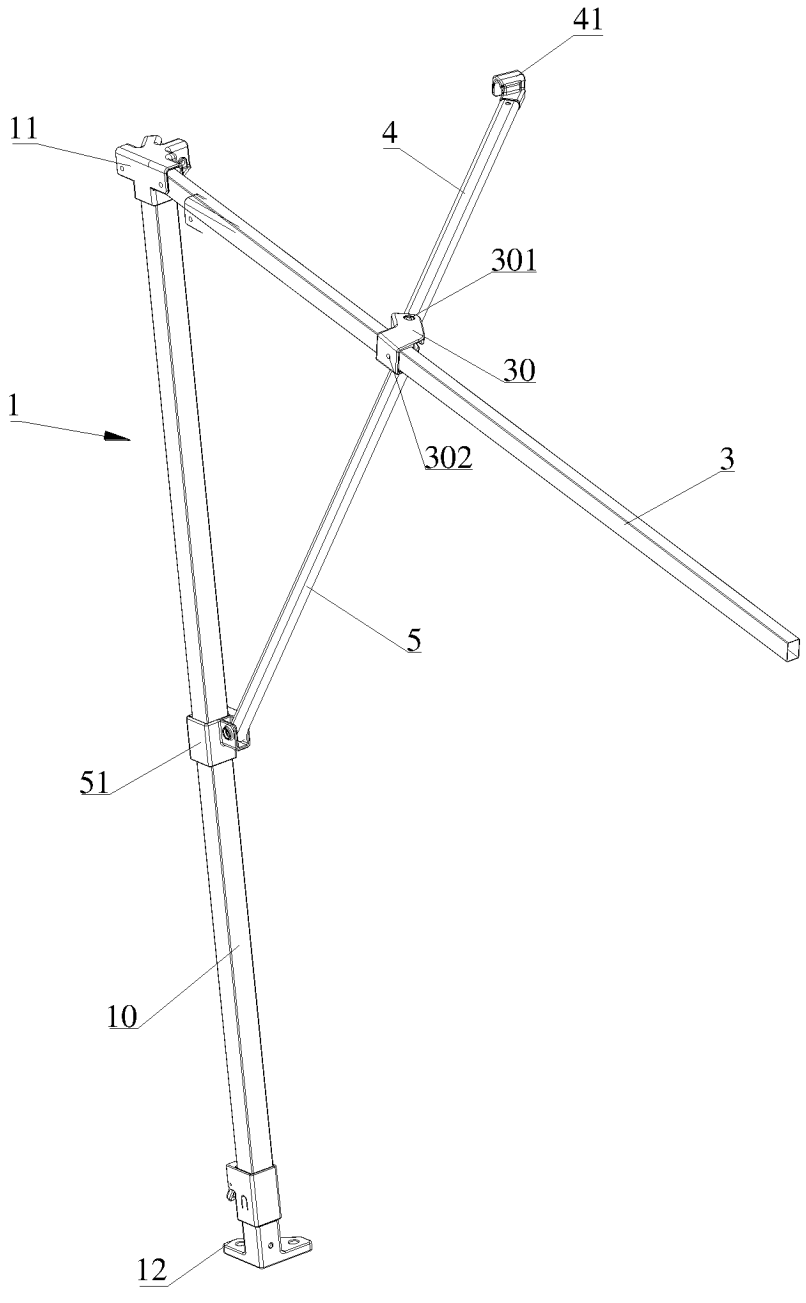

FIG. 8

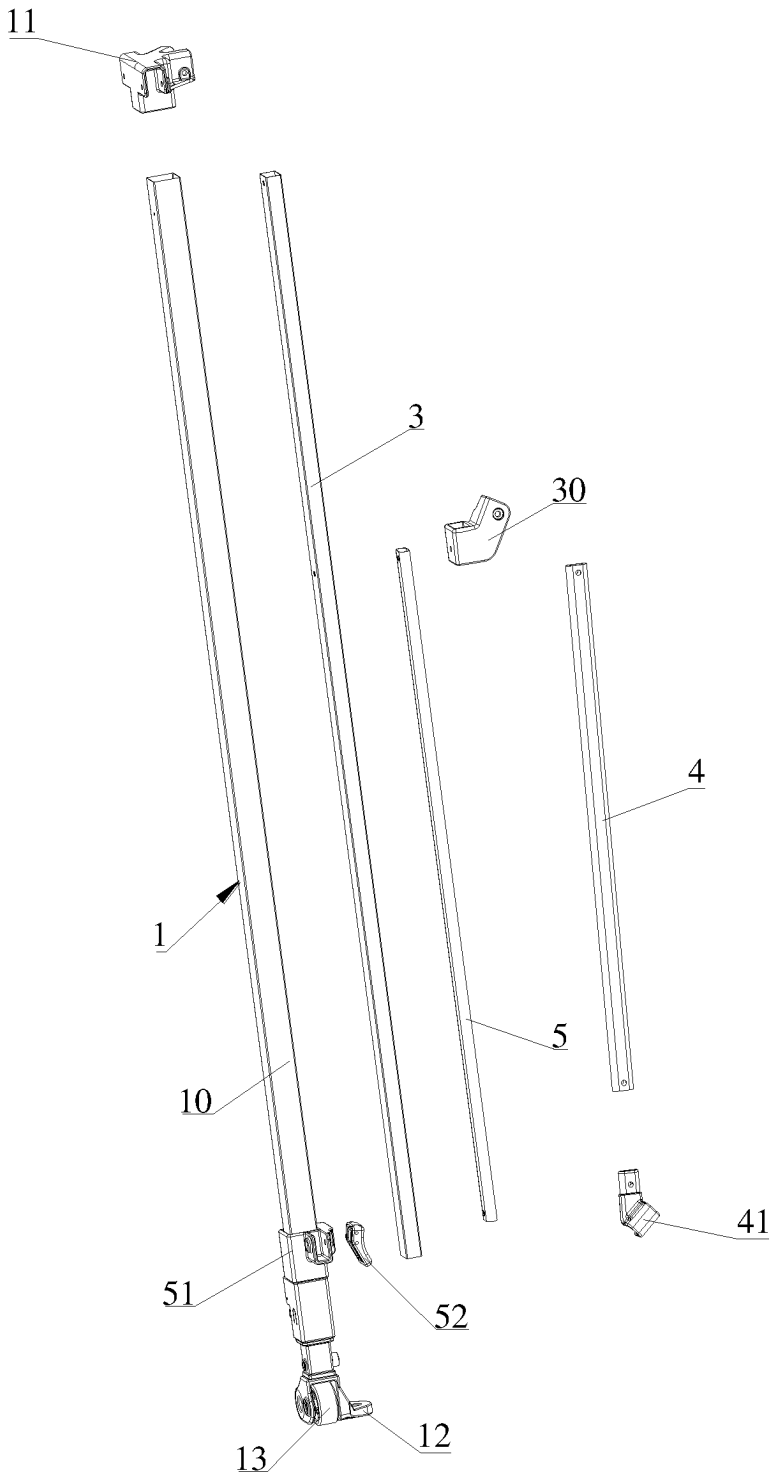

FIG. 9

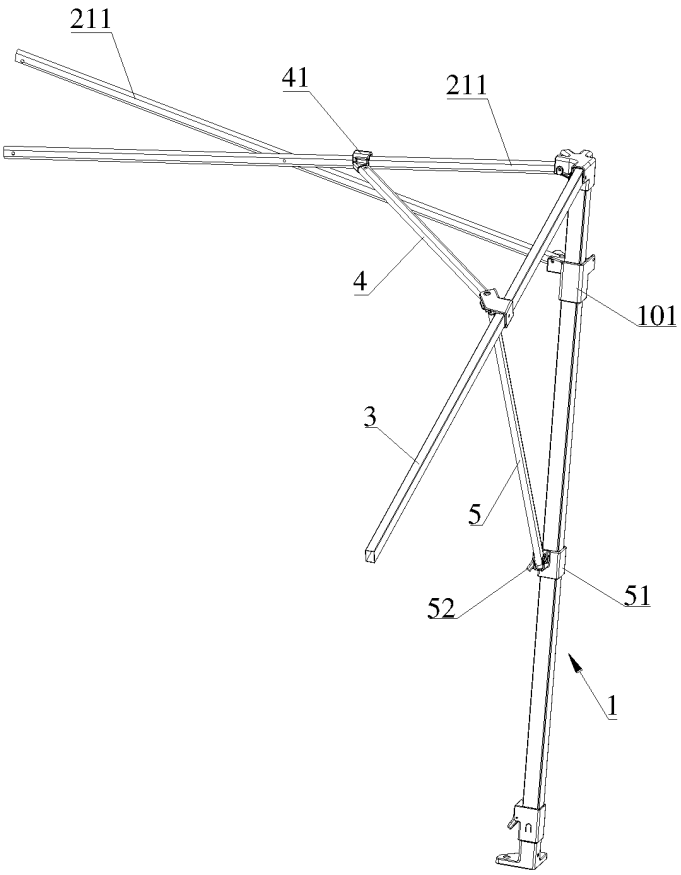

FIG. 10a

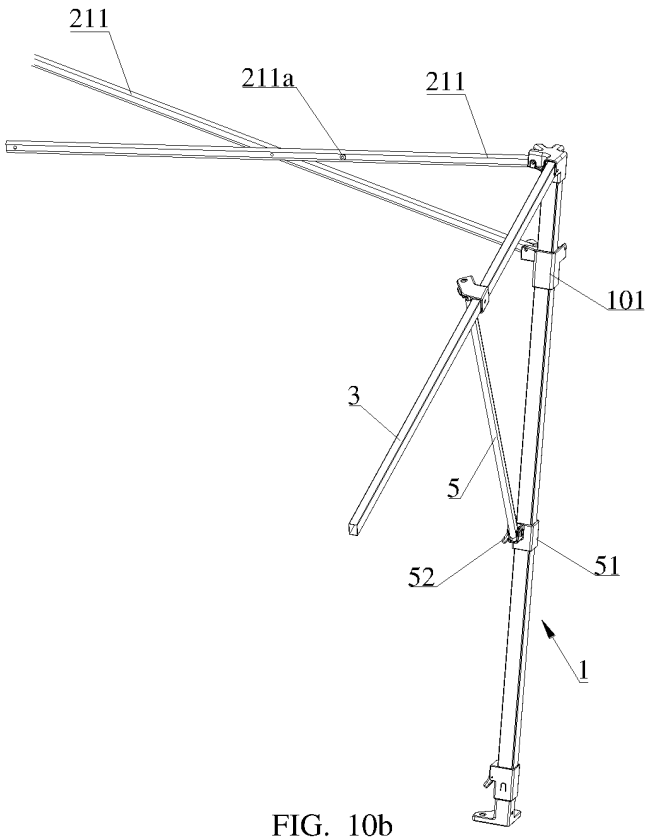

FIG. 10b

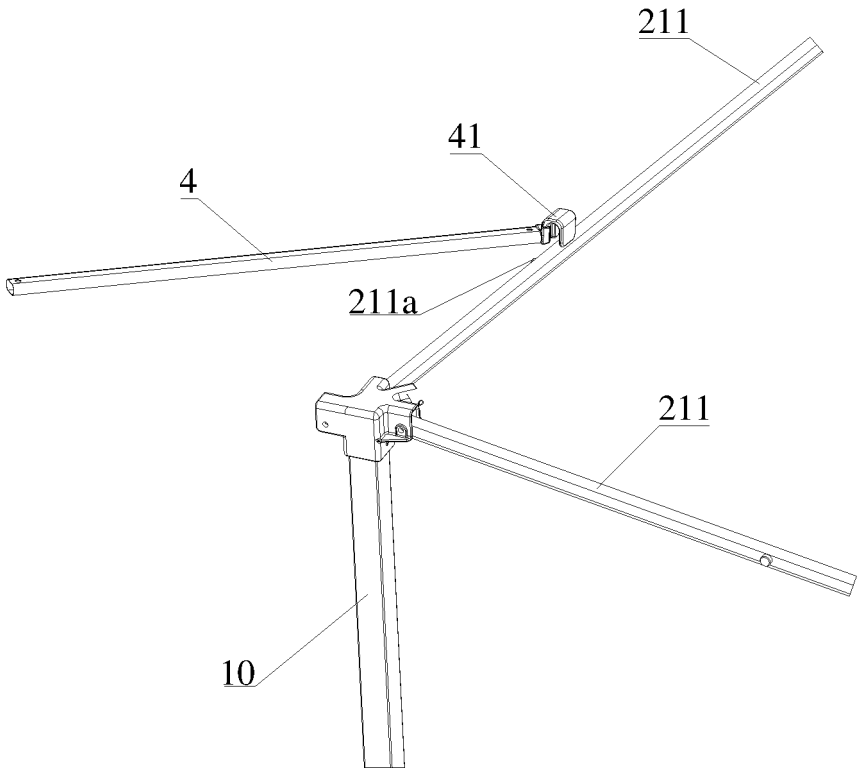

FIG. 11

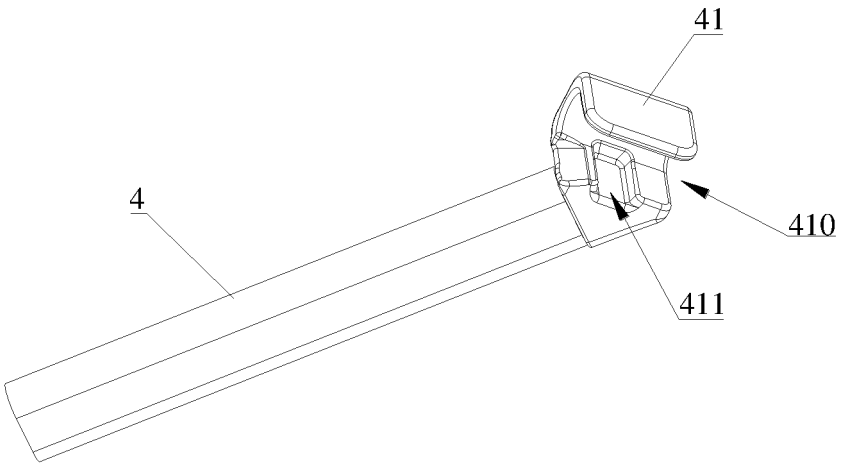

FIG. 12

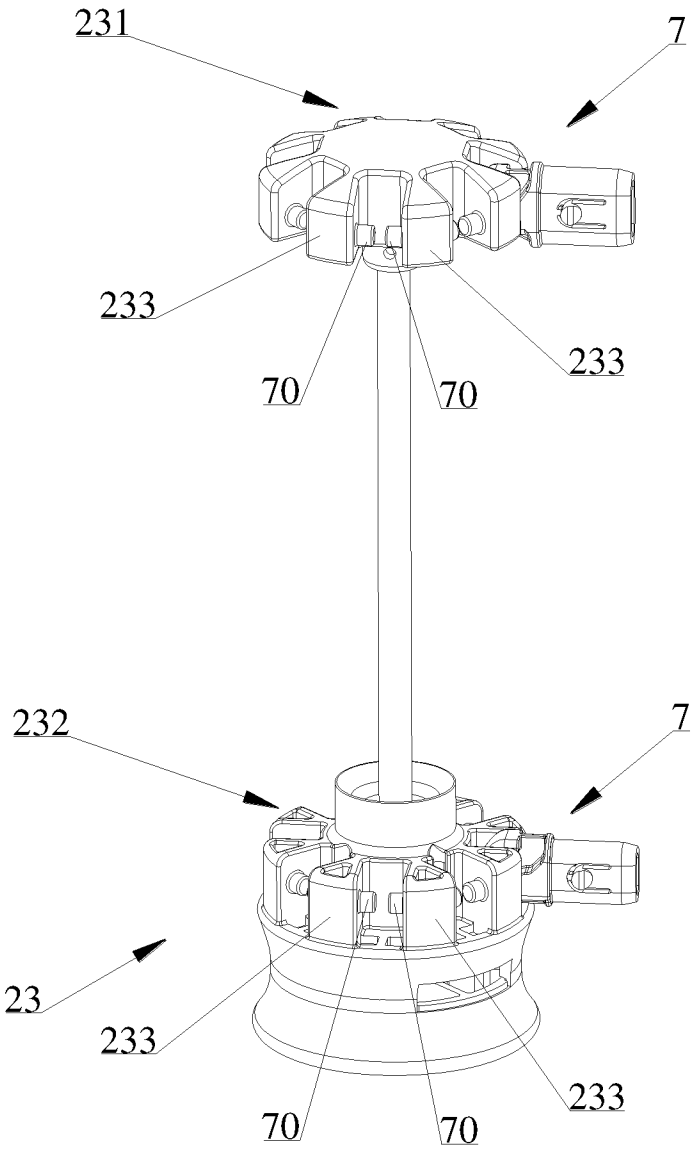

FIG. 13

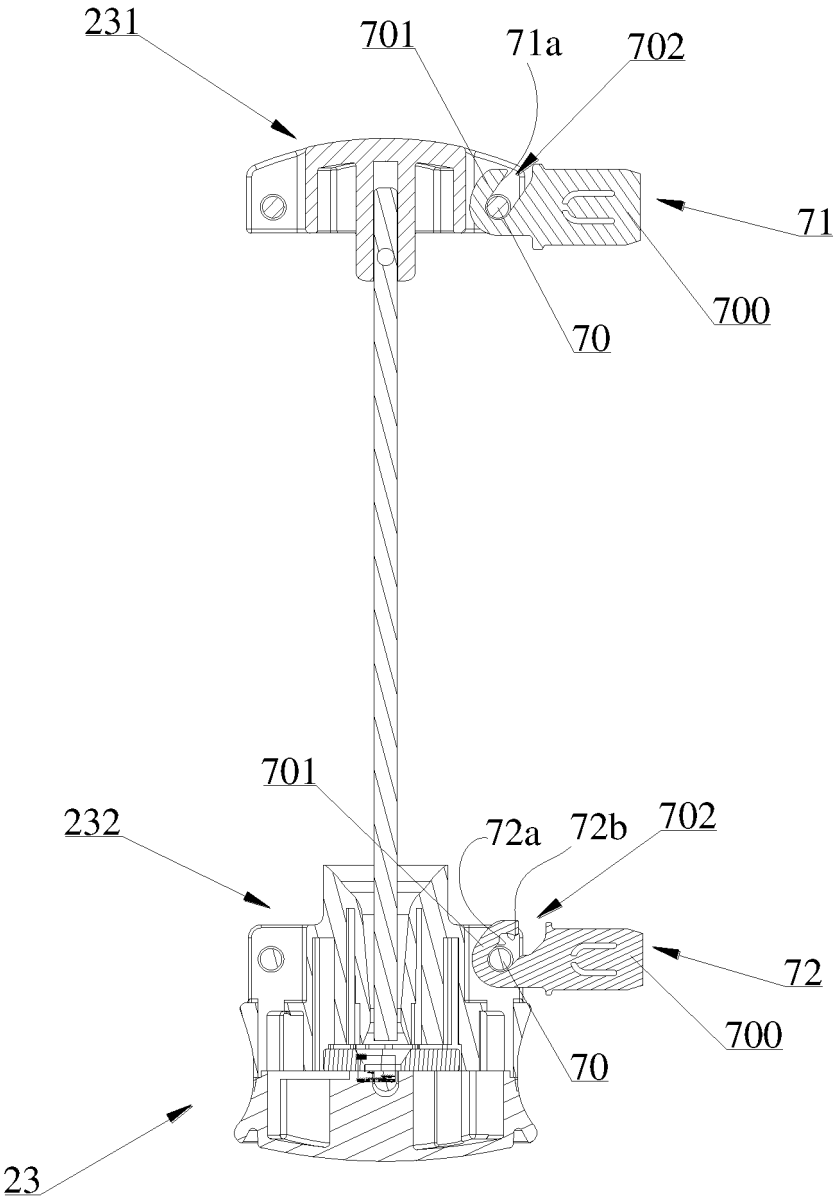

FIG. 14

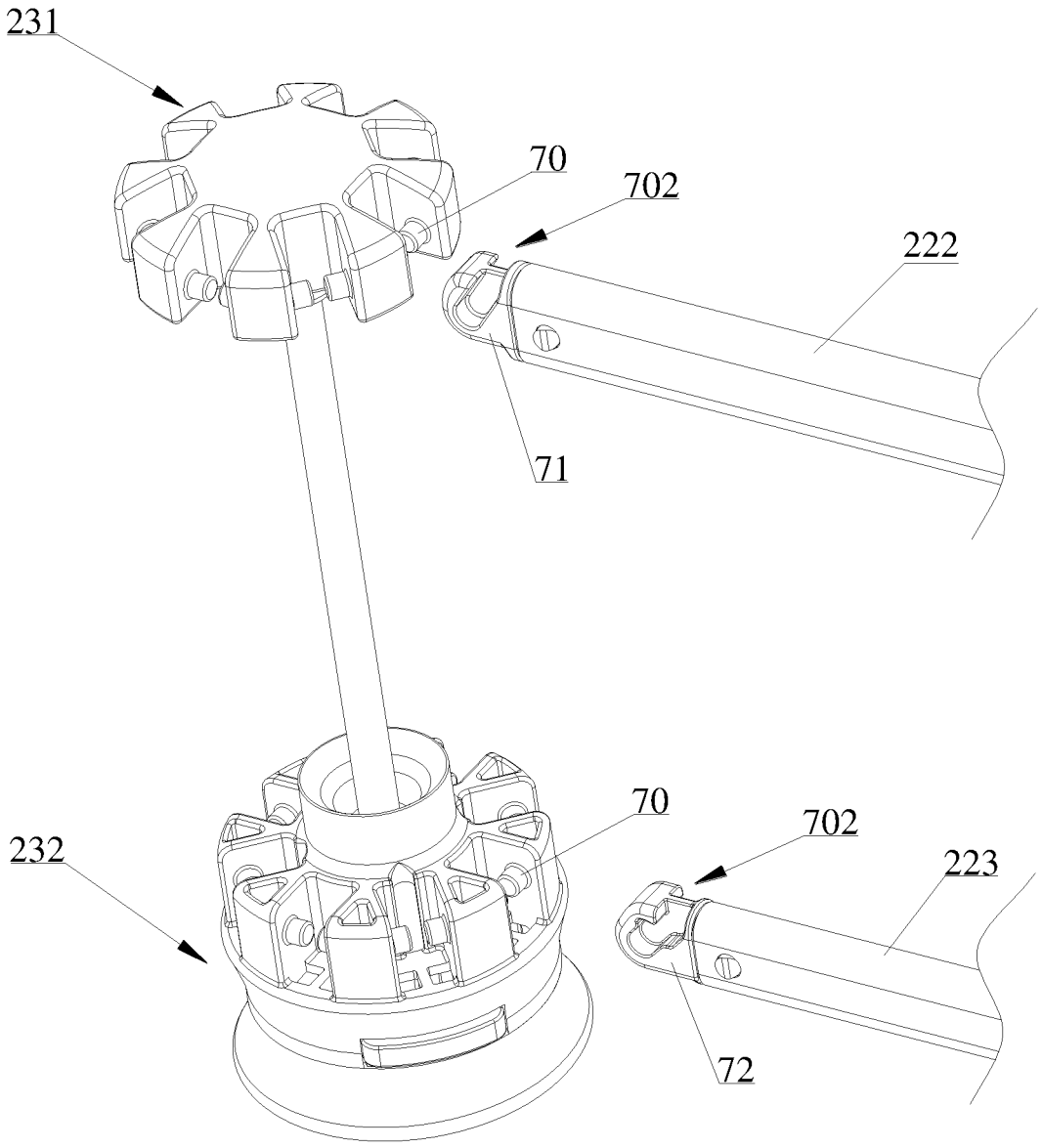

FIG. 15

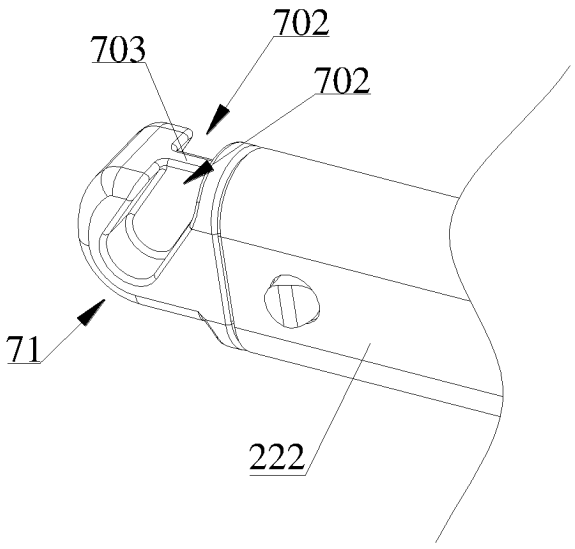

FIG. 16a

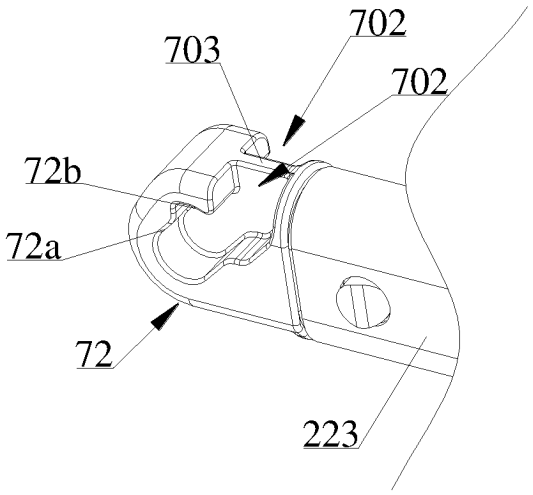

FIG. 16b

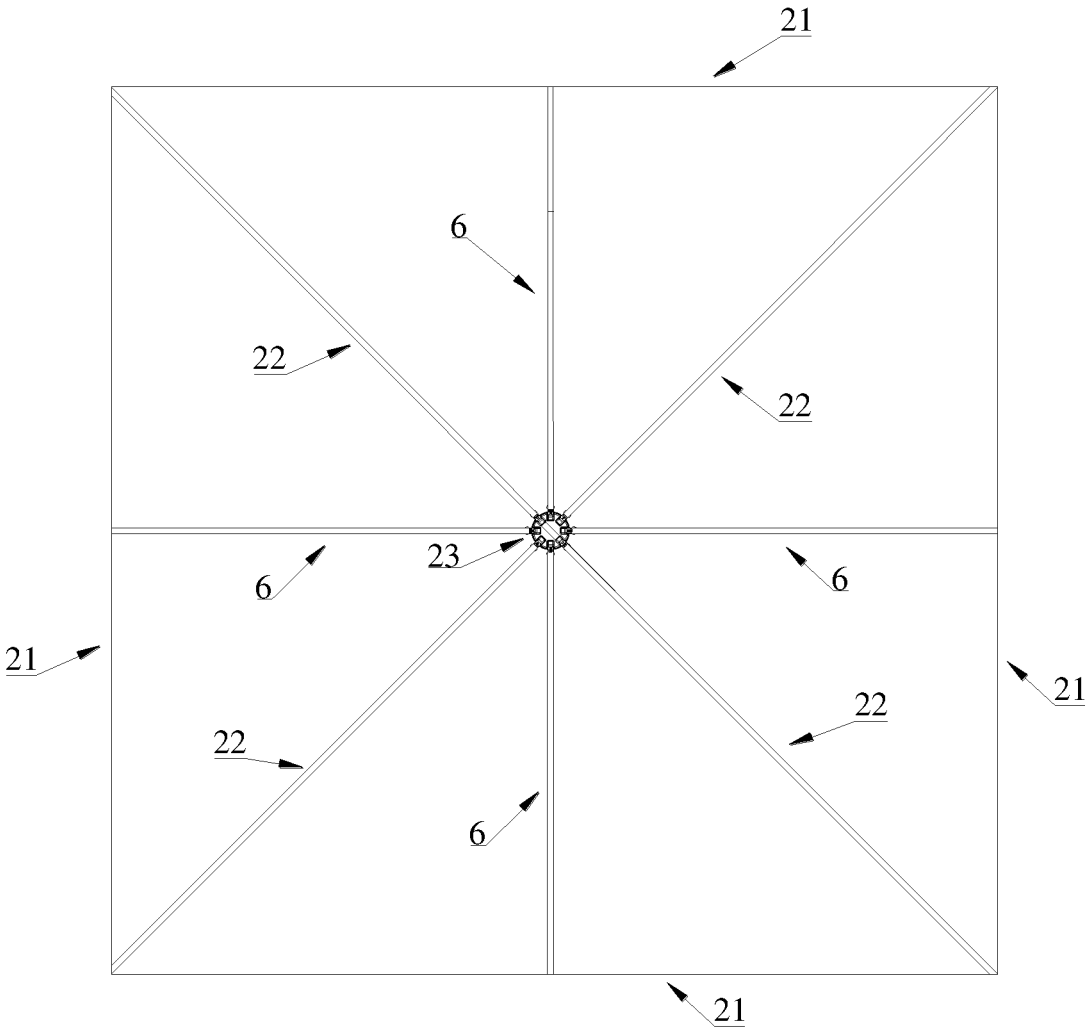

FIG. 17

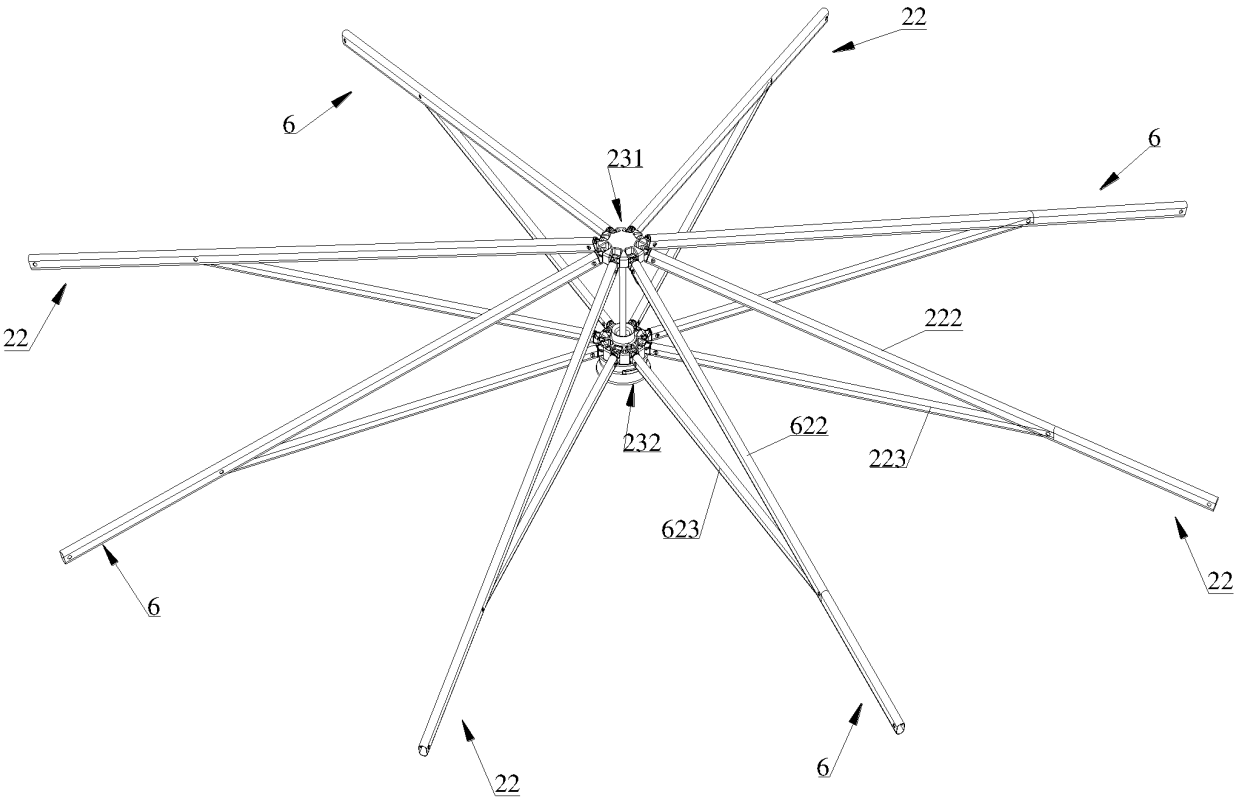

FIG. 18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/084056

A. CLASSIFICATION OF SUBJECT MATTER

E04H15/48(2006.01)i;E04H15/00(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:E04H15

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, VEN, CNKI: 檐, 横, 撑, 钩, 槽, 挂, 锁, 帽, eave, cross, support, sustain, brace, hook, groove, slot, recess, hang, lock, hat, cap

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 217129136 U (WEIZI E-COMMERCE (SHANGHAI) CO., LTD.) 05 August 2022 (2022-08-05) claims 1-11	1-14
X	CN 214835277 U (HENAN JIANSHENG LEISURE PRODUCTS CO., LTD.) 23 November 2021 (2021-11-23) description, paragraphs 3-26, and figures 1-4	1, 12
Y	CN 214835277 U (HENAN JIANSHENG LEISURE PRODUCTS CO., LTD.) 23 November 2021 (2021-11-23) description, paragraphs 3-26, and figures 1-4	2-11, 13
Y	CN 2721793 Y (FENGHAN (XIAMEN) PLASTIC DEVELOPMENT CO., LTD.) 31 August 2005 (2005-08-31) description, pages 1-4, and figures 1-6	2-11
Y	CN 206337894 U (CAMPVALLEY (XIAMEN) LEISURE PRODUCTS CO., LTD.) 18 July 2017 (2017-07-18) description, paragraph 4, and figures 1 and 2	13

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search	Date of mailing of the international search report
19 April 2023	**20 April 2023**
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.

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INTERNATIONAL SEARCH REPORT

International application No.
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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	CN 214463132 U (NINGBO MANDAO LEISURE PRODUCTS CO., LTD.) 22 October 2021 (2021-10-22) entire document	1-14
A	CN 215485101 U (ZHEJIANG HUIGUAN LEISURE PRODUCTS CO., LTD.) 11 January 2022 (2022-01-11) entire document	1-14
A	CN 208718492 U (NINGBO MANDAO LEISURE PRODUCT CO., LTD.) 09 April 2019 (2019-04-09) entire document	1-14
A	US 2010139728 A1 (ZENG CHUNRONG) 10 June 2010 (2010-06-10) entire document	1-14

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2023/084056

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 217129136 U	05 August 2022	None	
CN 214835277 U	23 November 2021	None	
CN 2721793 Y	31 August 2005	None	
CN 206337894 U	18 July 2017	None	
CN 214463132 U	22 October 2021	None	
CN 215485101 U	11 January 2022	None	
CN 208718492 U	09 April 2019	None	
US 2010139728 A1	10 June 2010	None	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 2022207262950 **[0001]**