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(54) **FRAME FOR SHADING PRODUCT AND
BEACH UMBRELLA**

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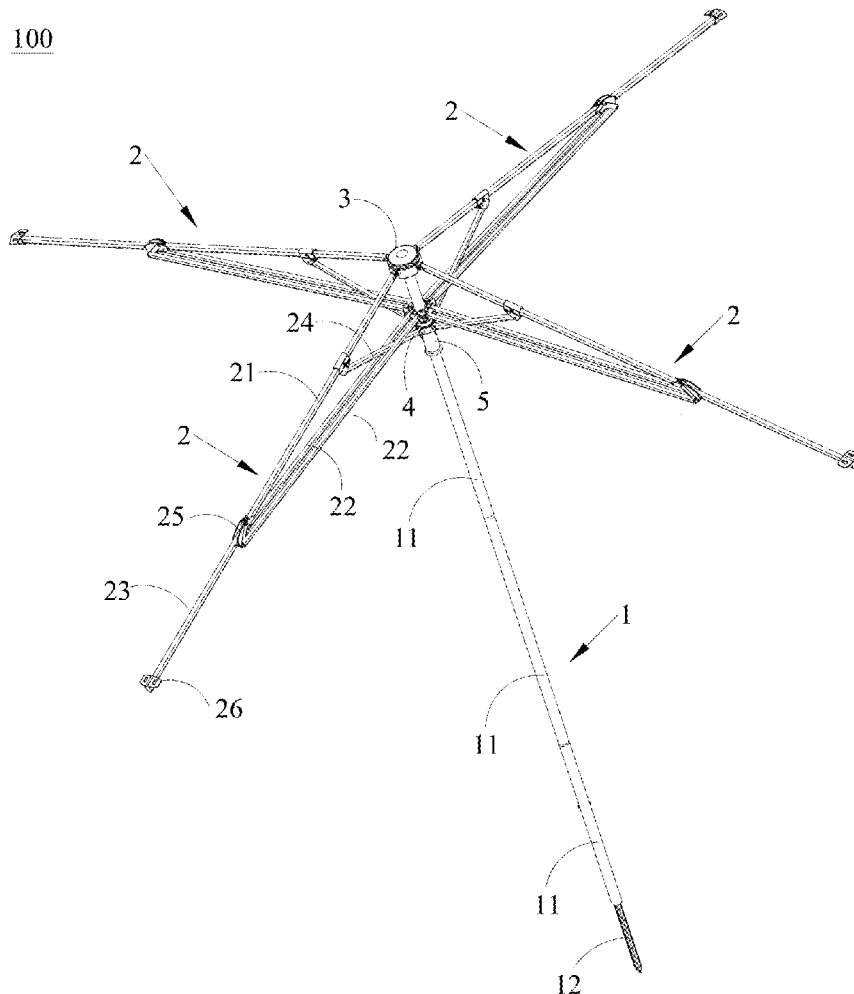
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(57) **ABSTRACT**

A frame for a shading product and a beach umbrella is provided. The frame for a shading product includes a central rod, a plurality of top frame units, a first slider arranged on the central rod and an extension rod. Each top frame unit includes a first top rod rotatably connected to the central rod and a second top rod. Each second top rod is rotatably connected to the first slider, and the first top rods, the second top rods, the central rod and the first slider form crank-slider mechanisms. The extension rod is pivotally connected to one top frame unit to allow the extension rod to flip upwards relative to the top frame unit when the frame for a shading product overturns on its side to the ground.



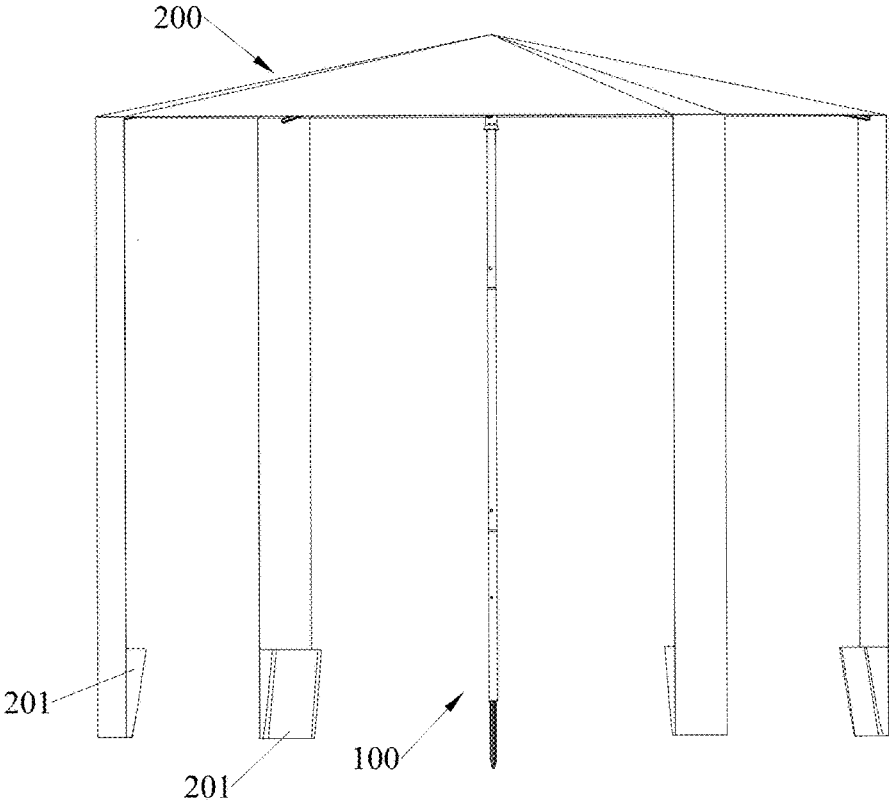


Fig. 1

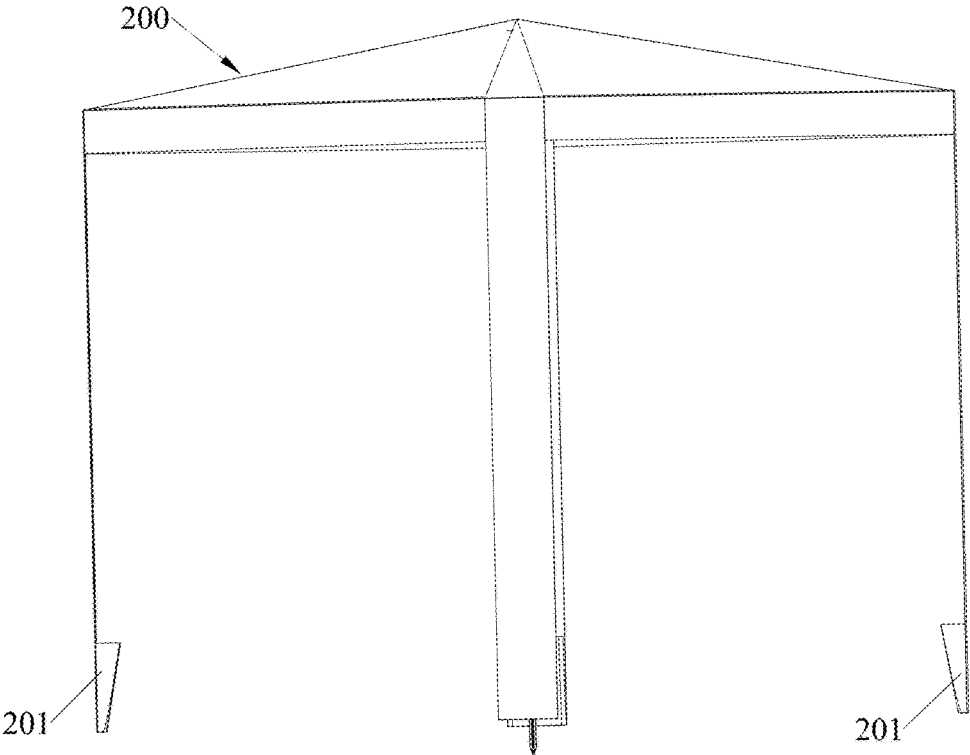


Fig. 2

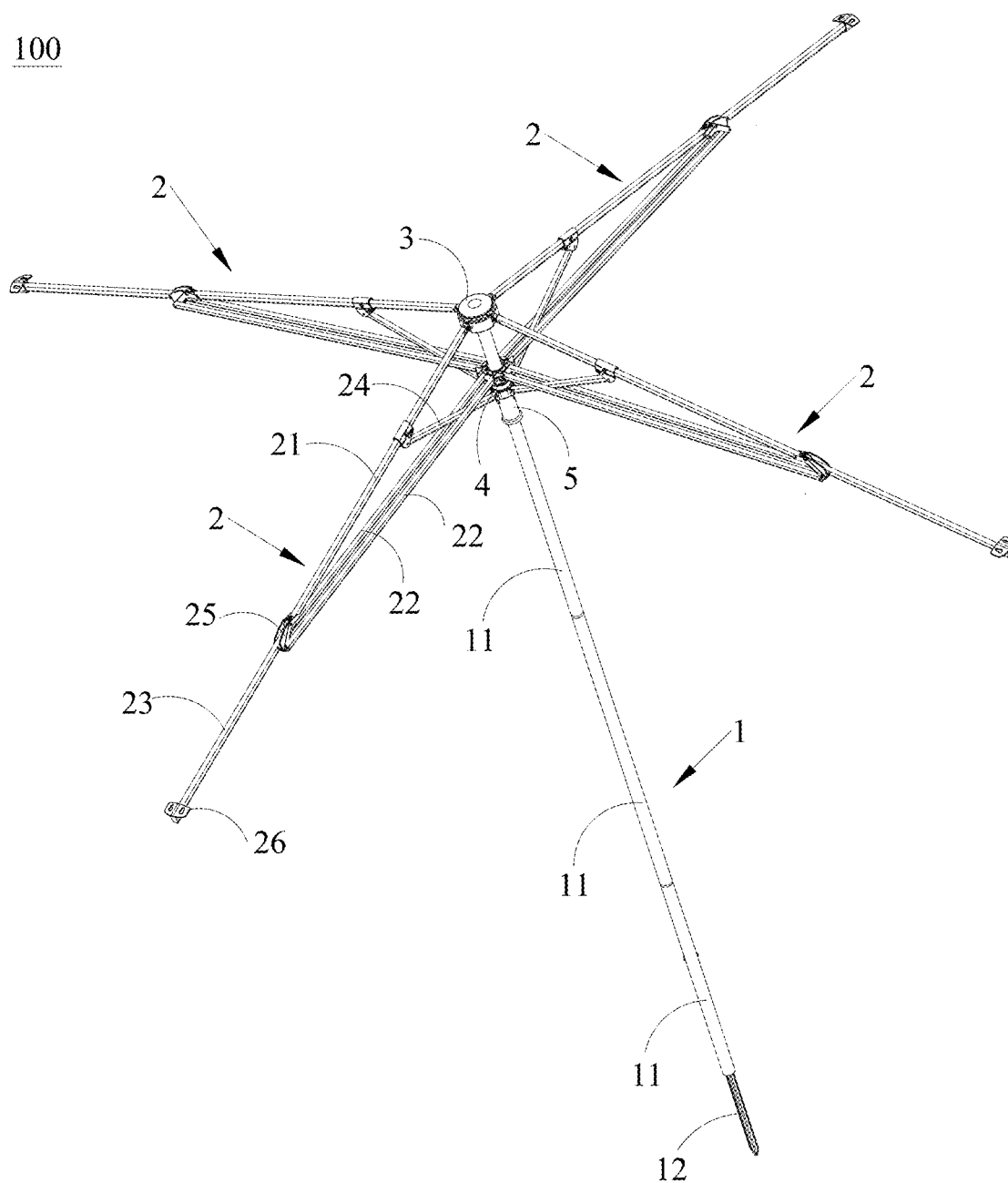


Fig. 3

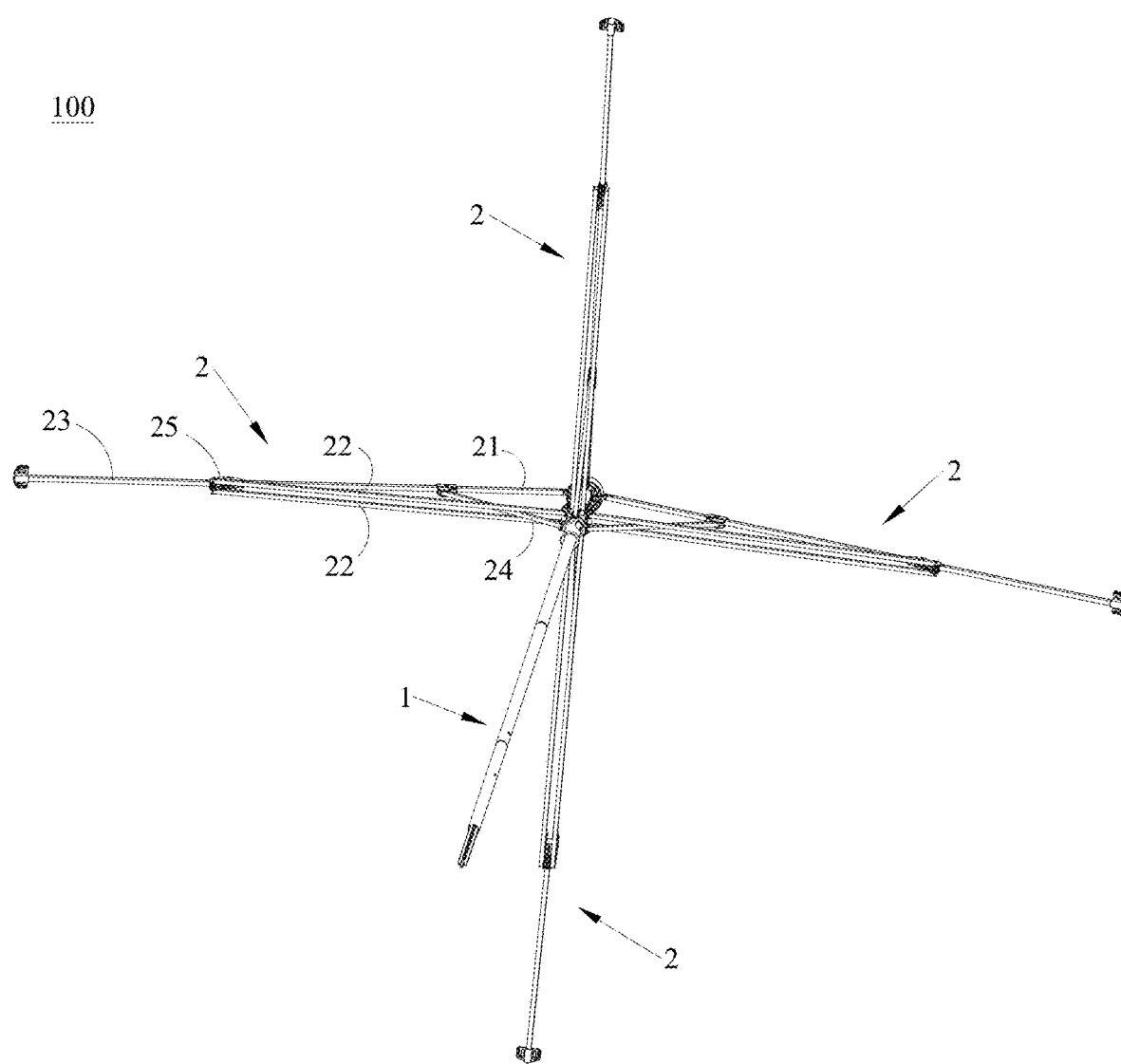


Fig. 4

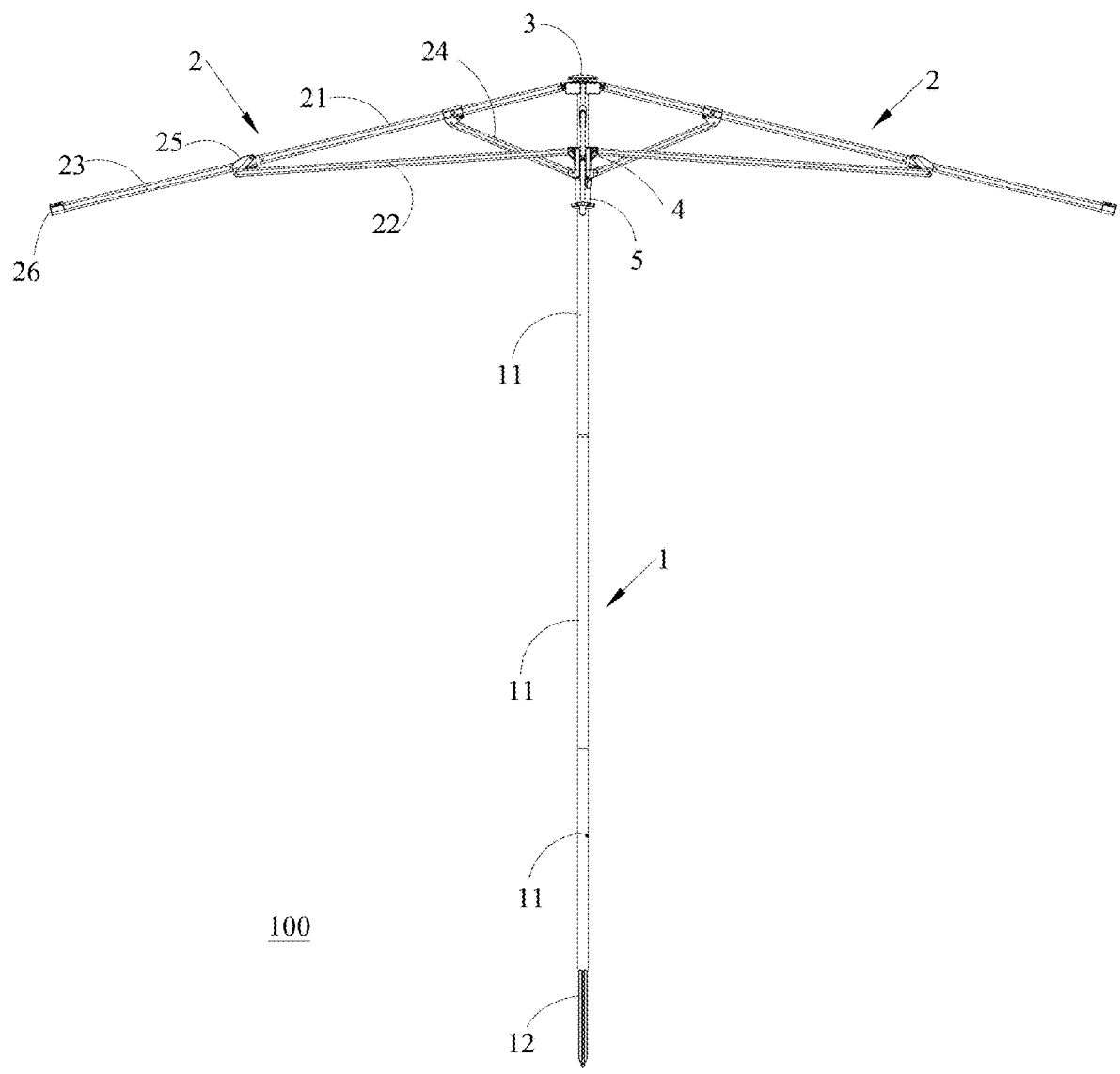


Fig. 5

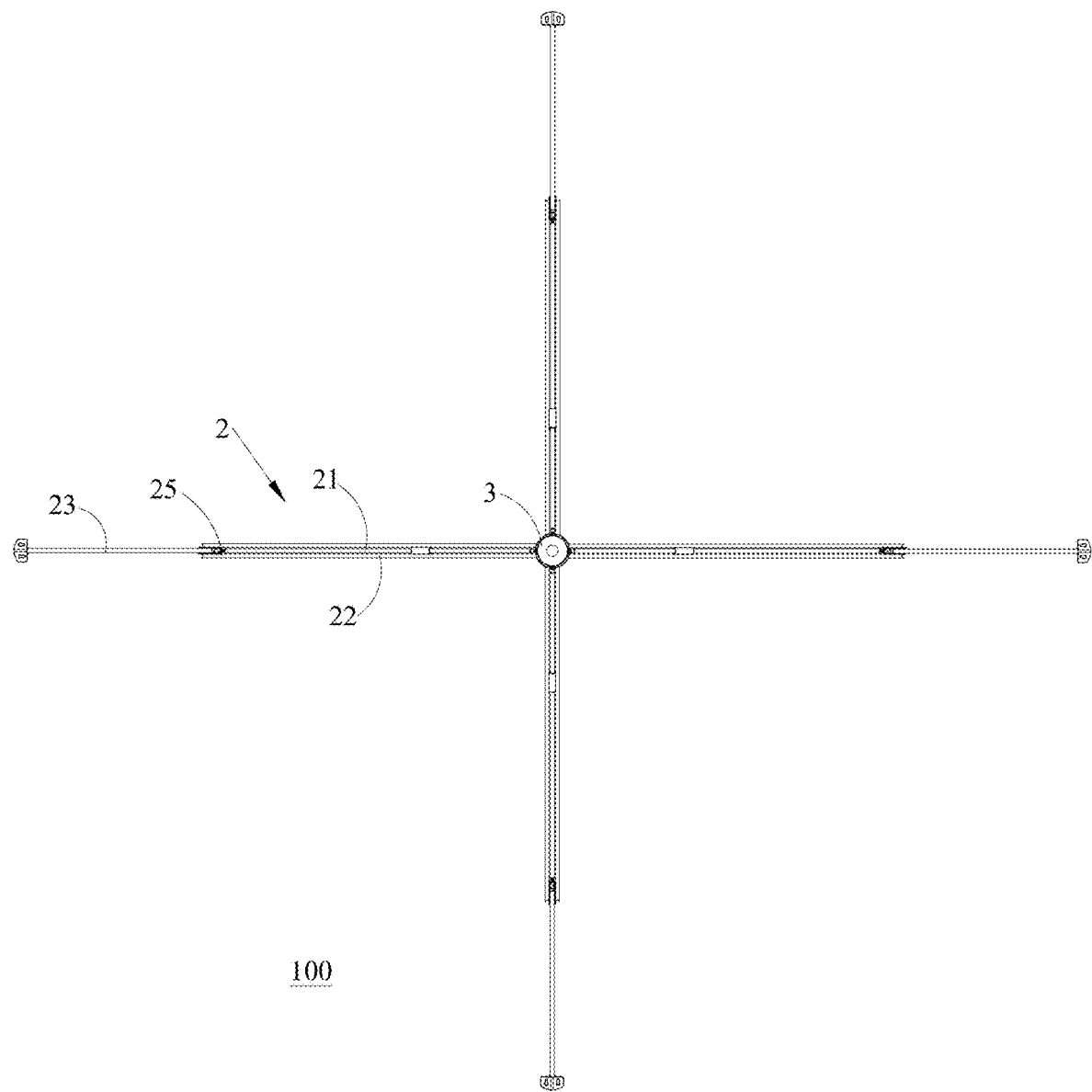


Fig. 6

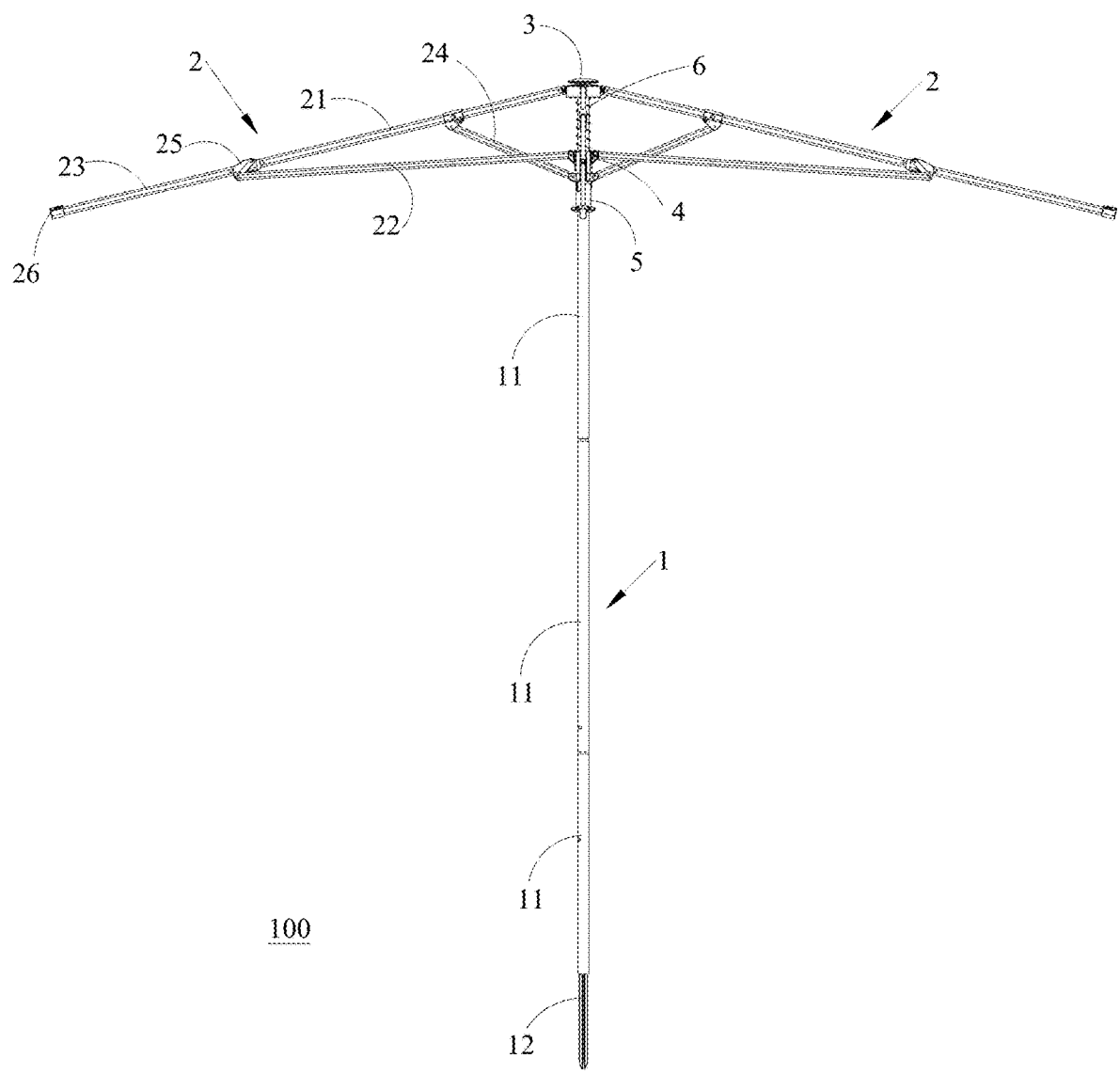


Fig. 7

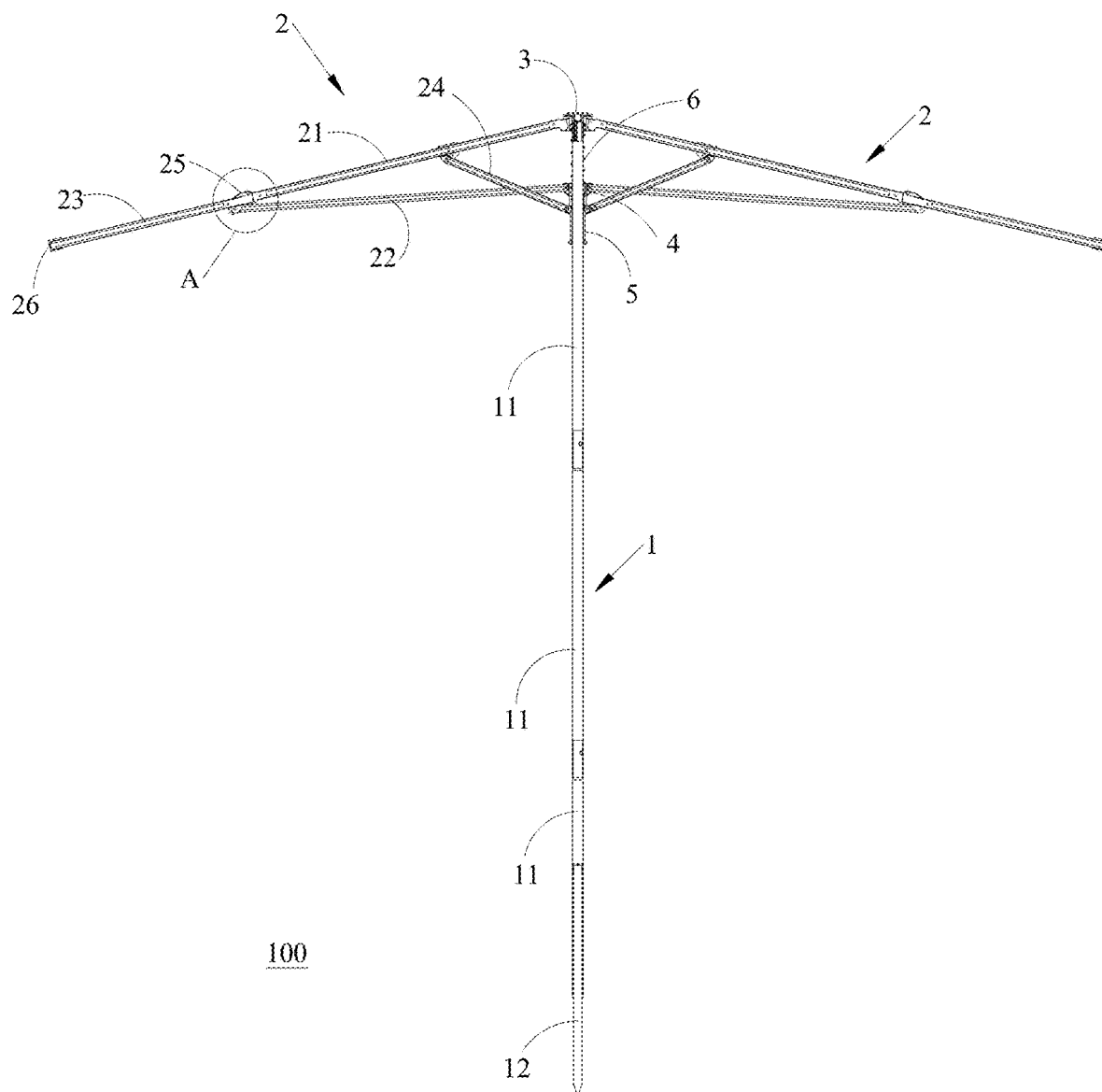


Fig. 8

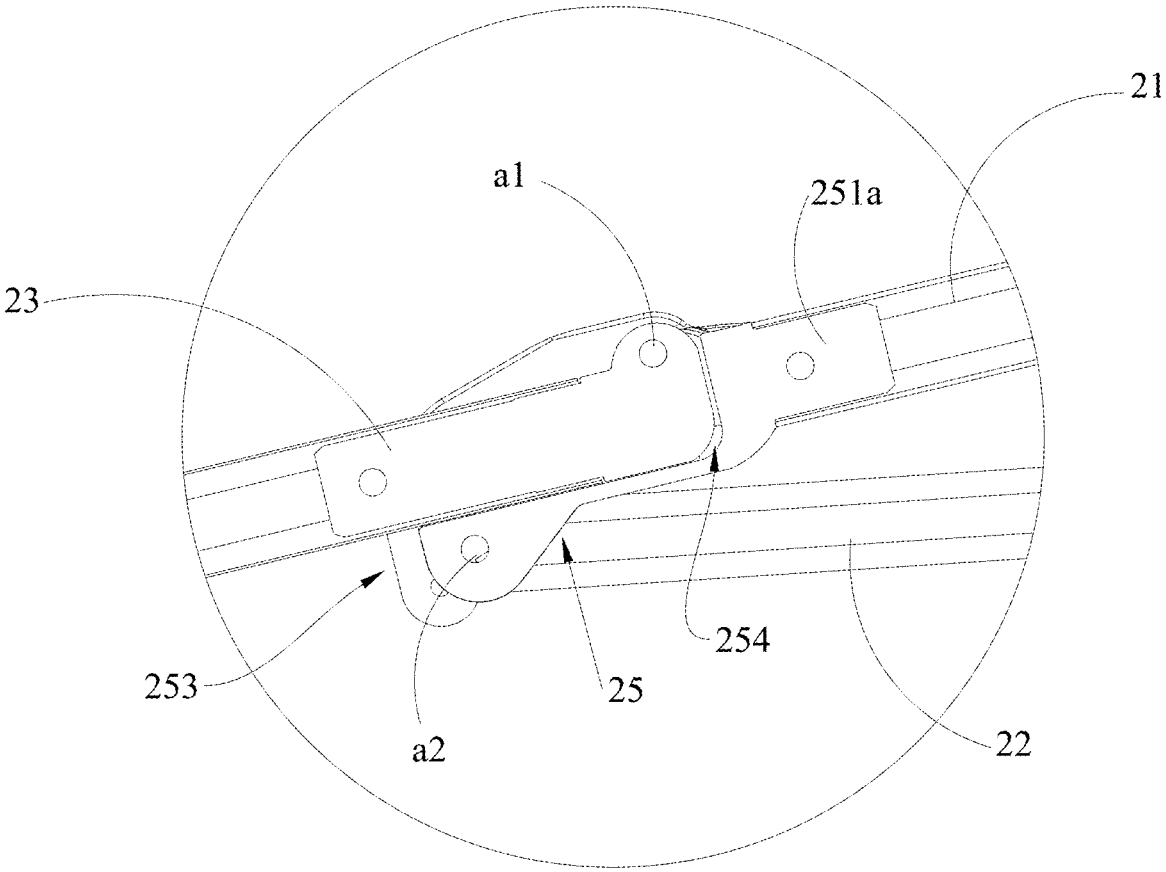


Fig. 9

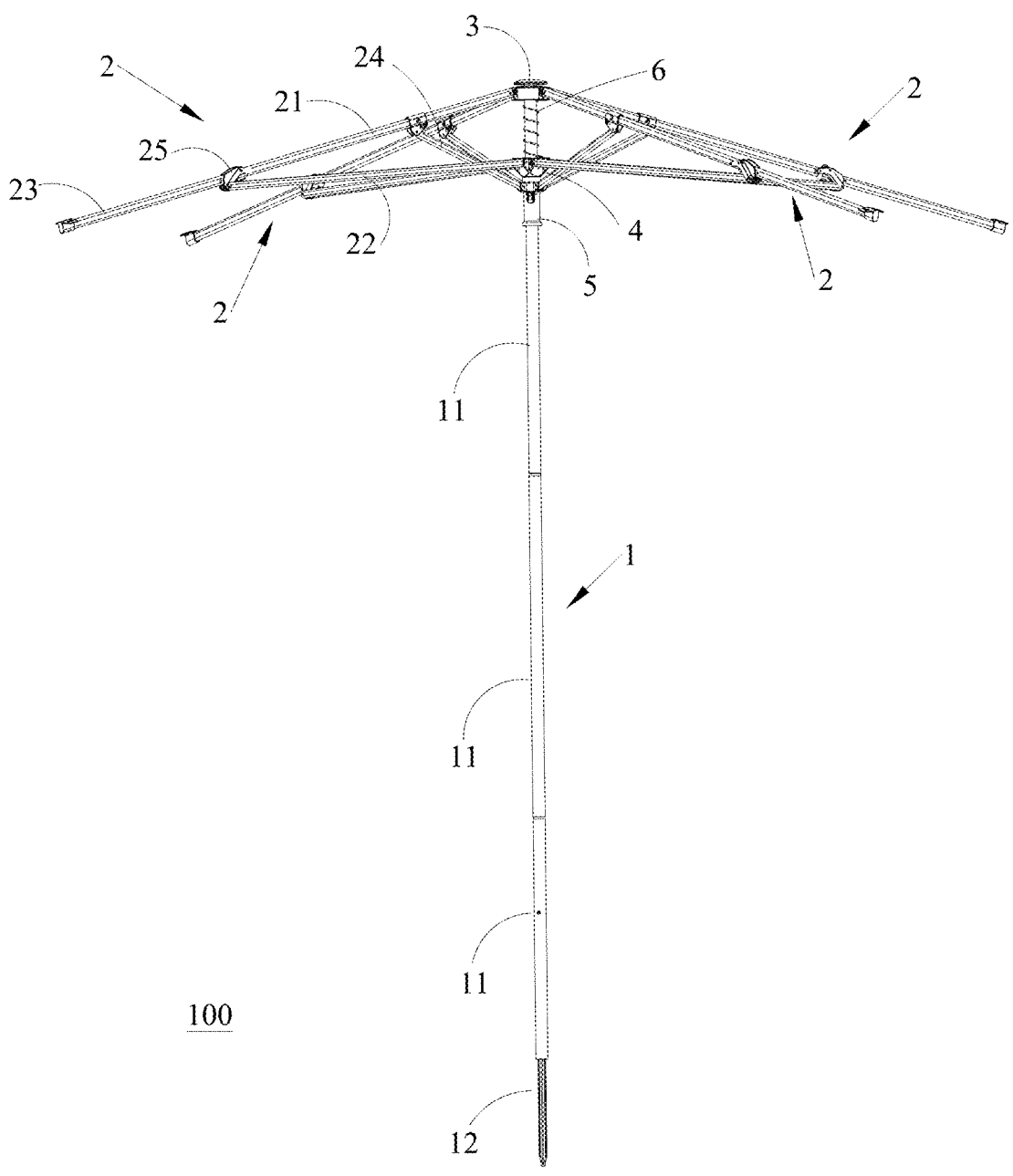


Fig. 10

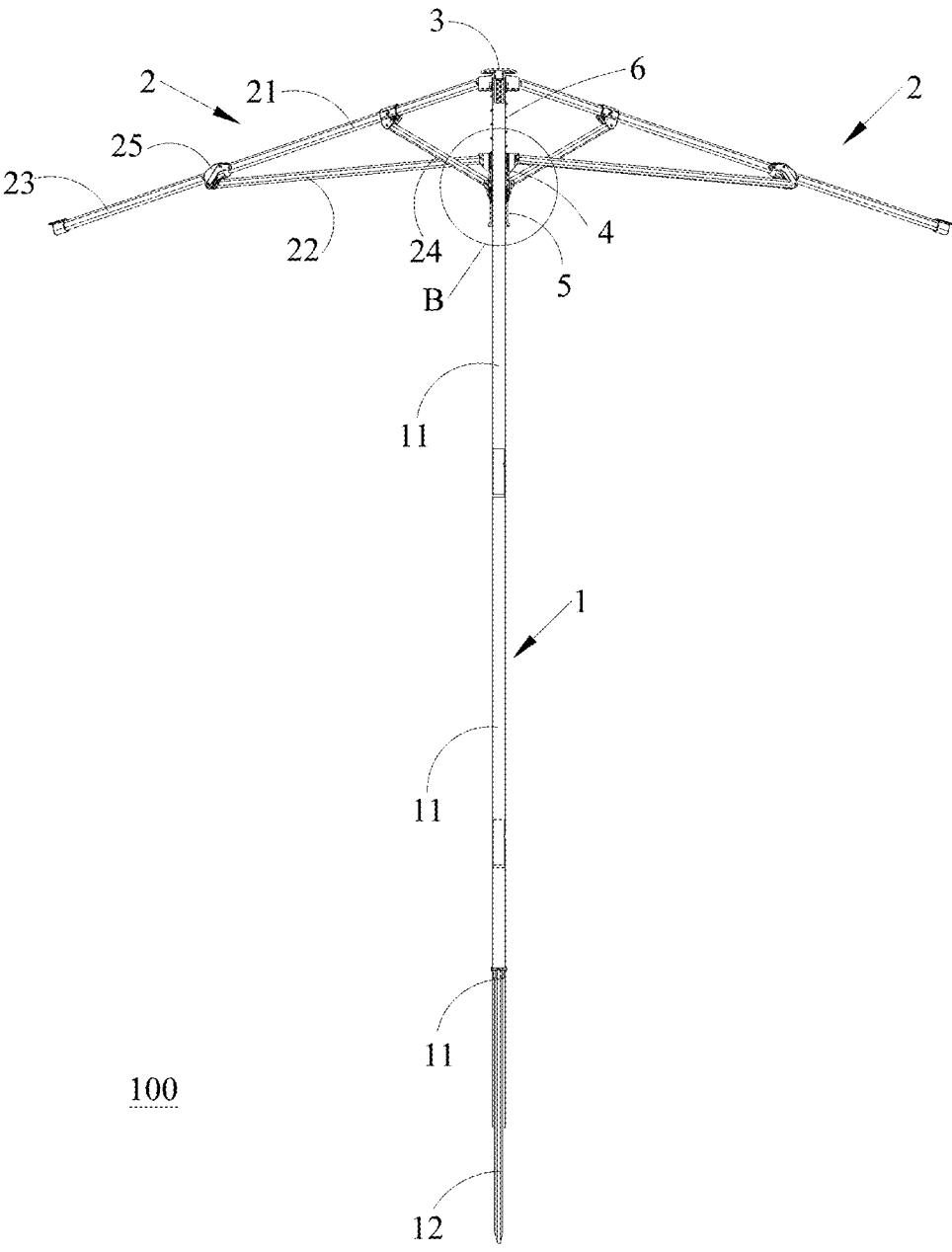


Fig. 11

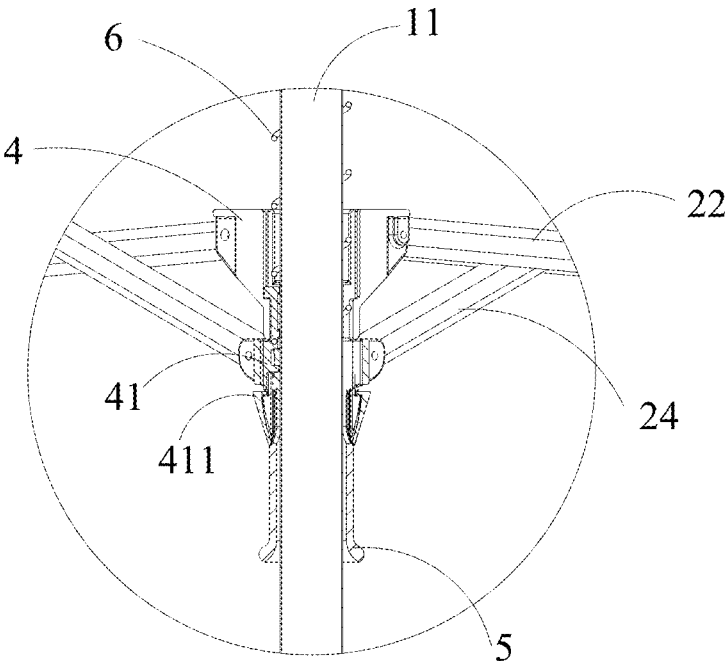


Fig. 12

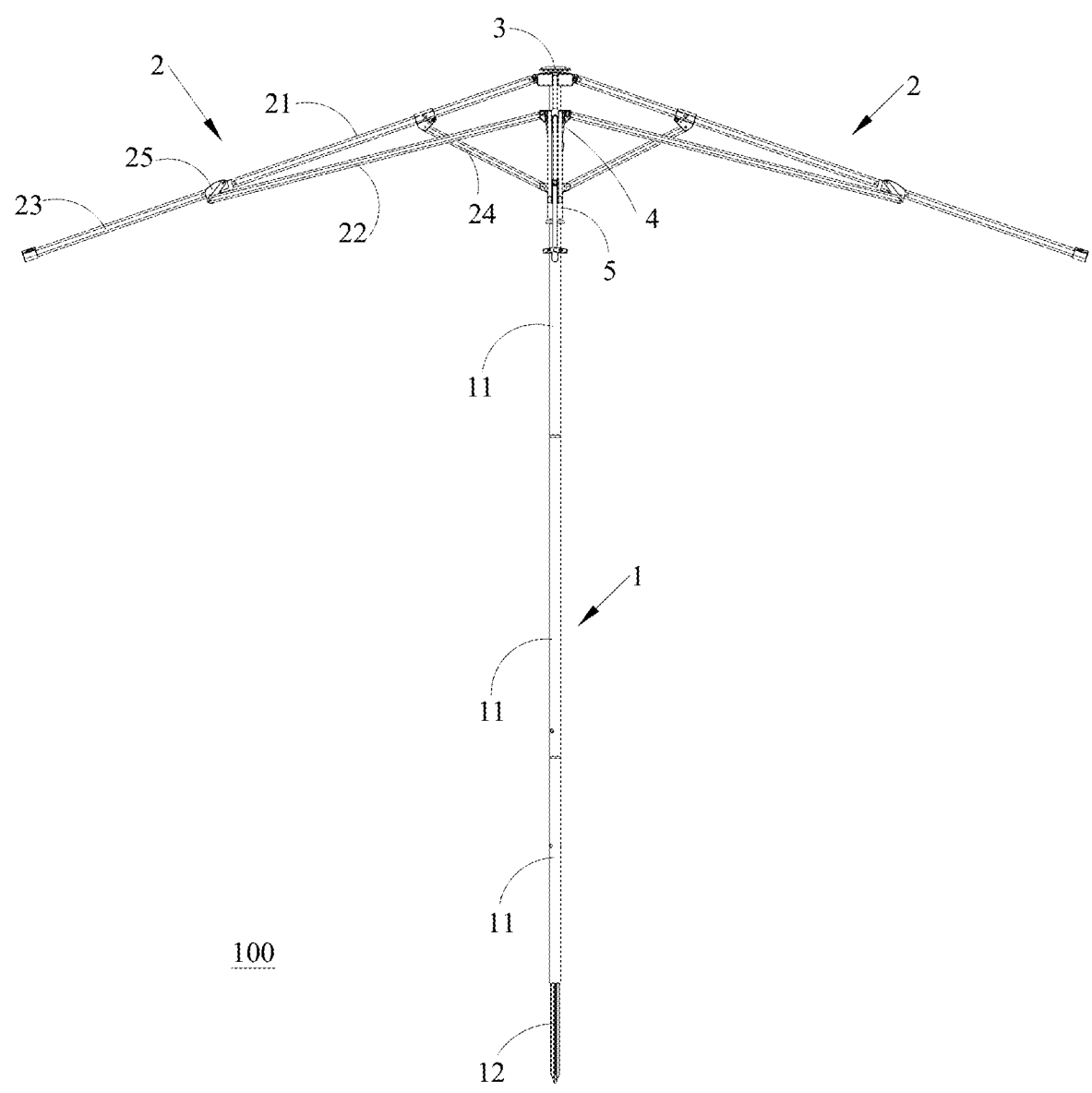


Fig. 13

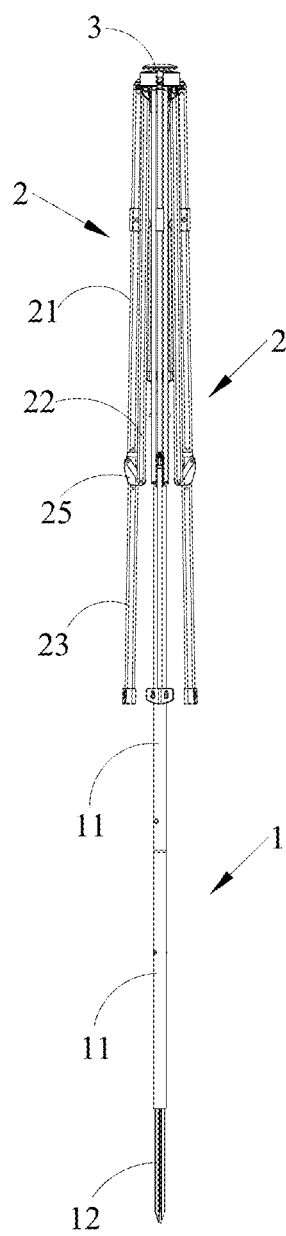


Fig. 14

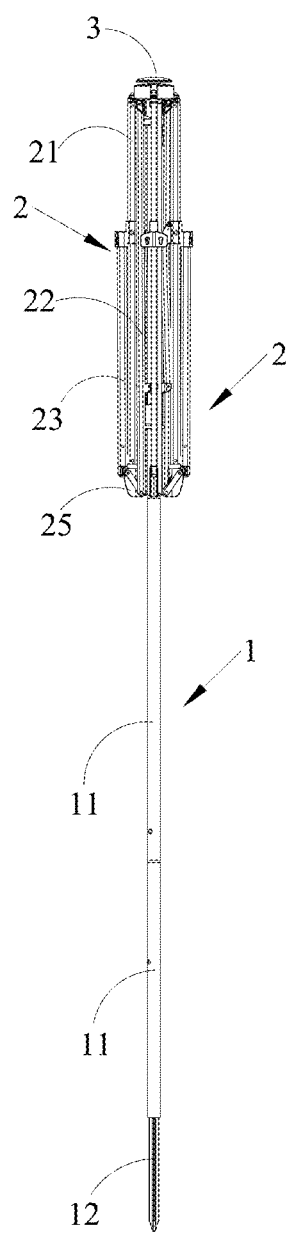


Fig. 15

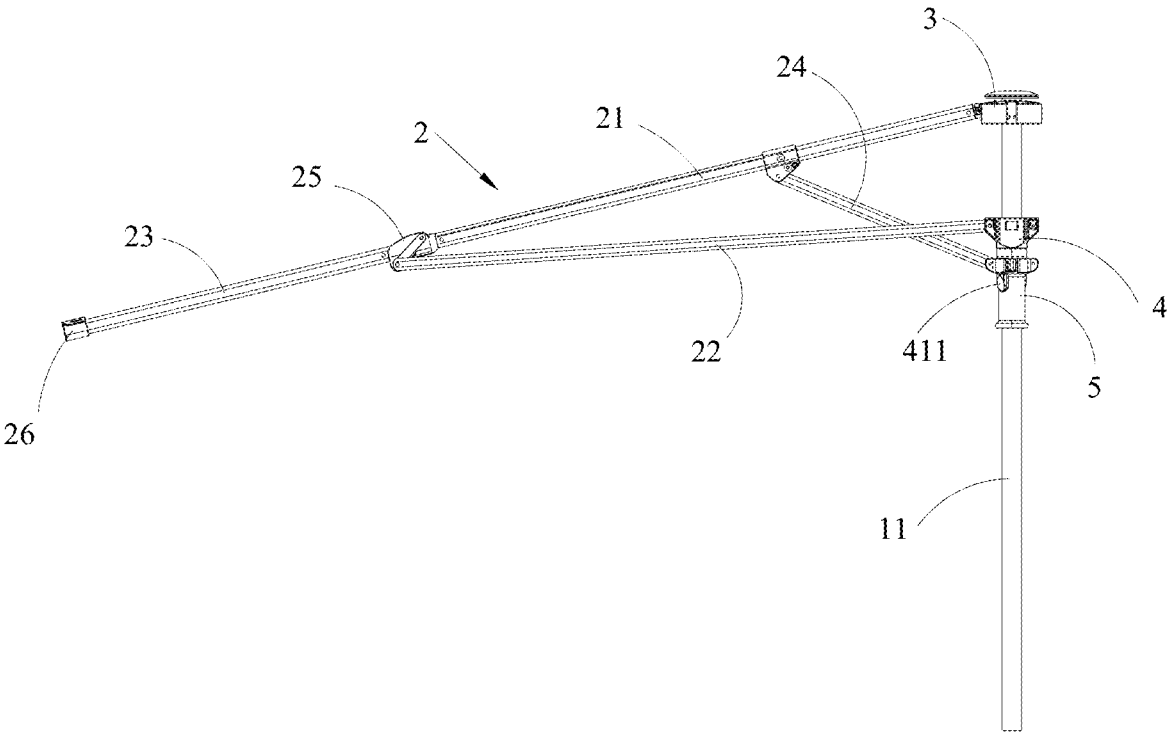


Fig. 16

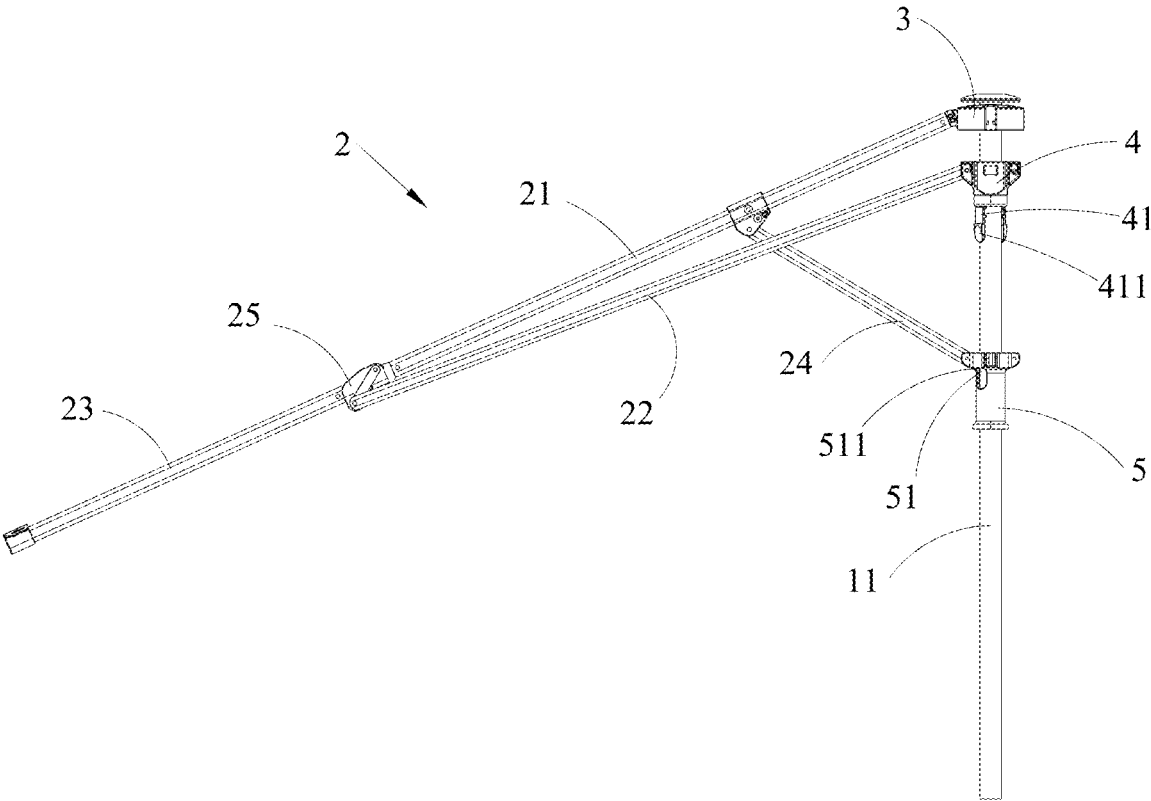


Fig. 17

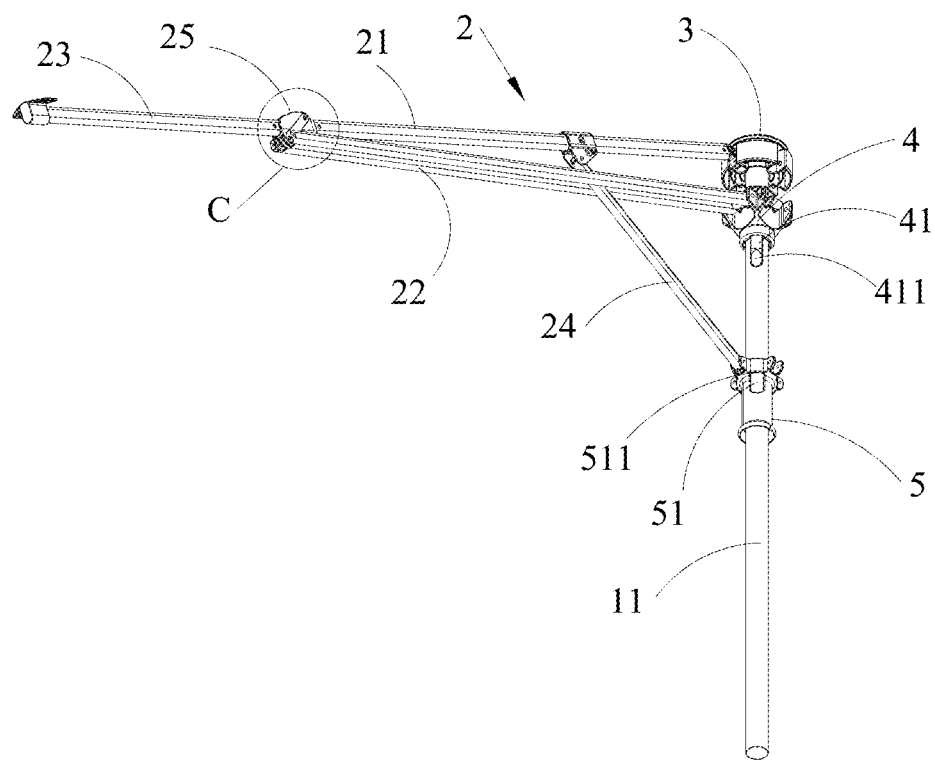


Fig. 18

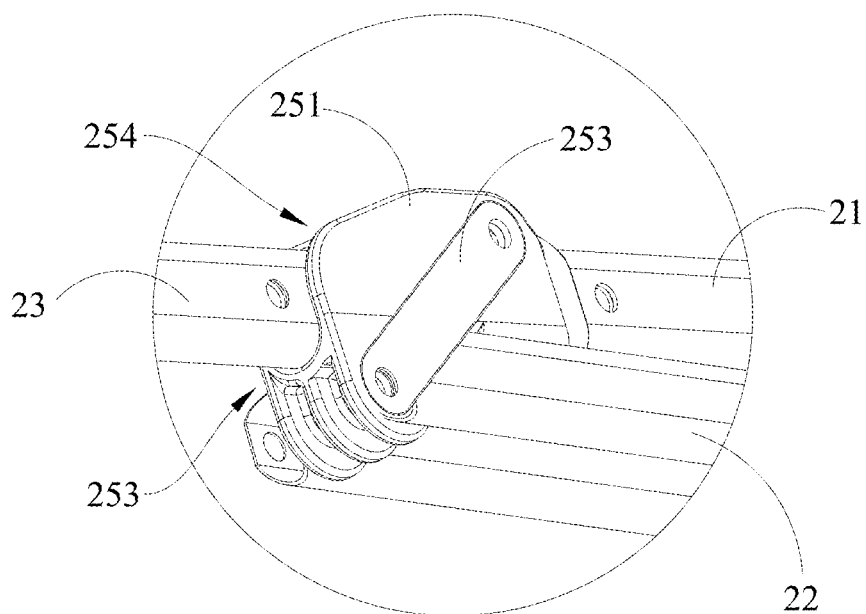


Fig. 19

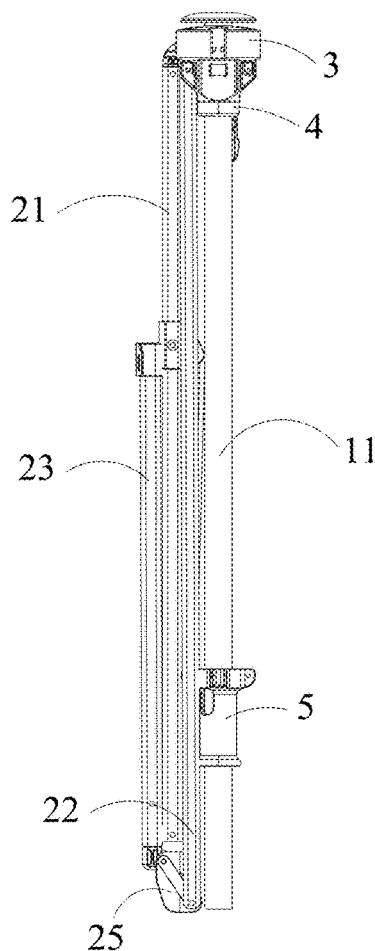


Fig. 20

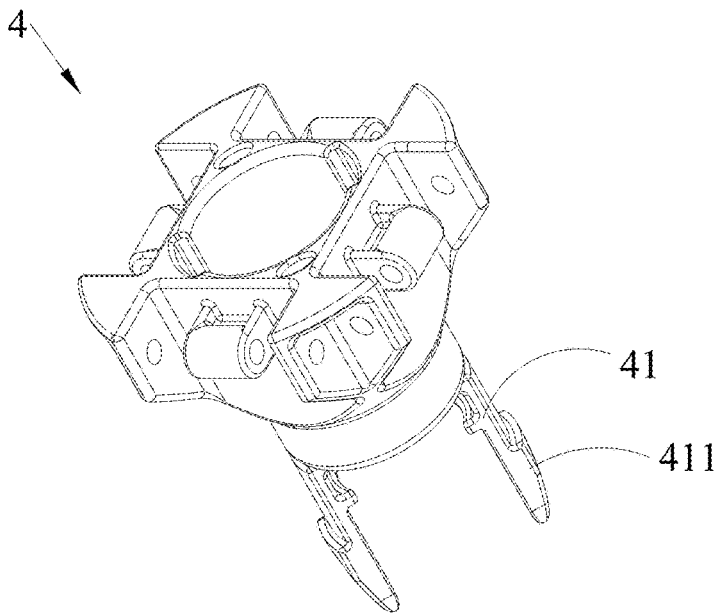


Fig. 21

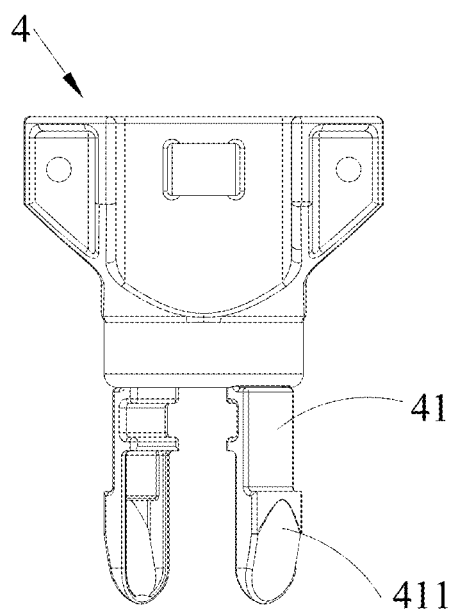


Fig. 22

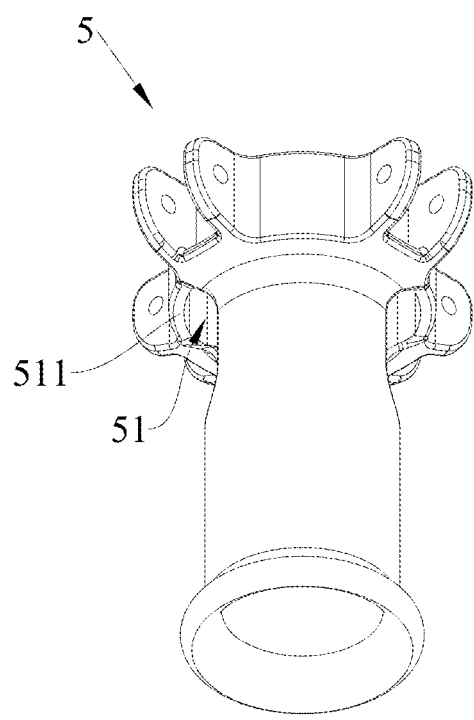


Fig. 23

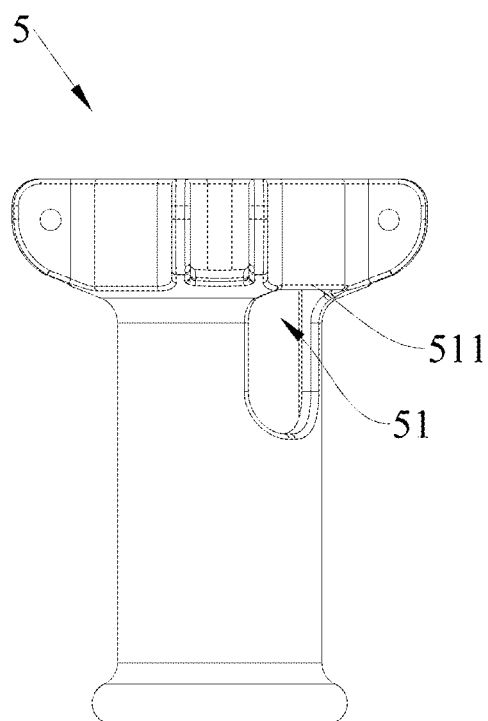


Fig. 24

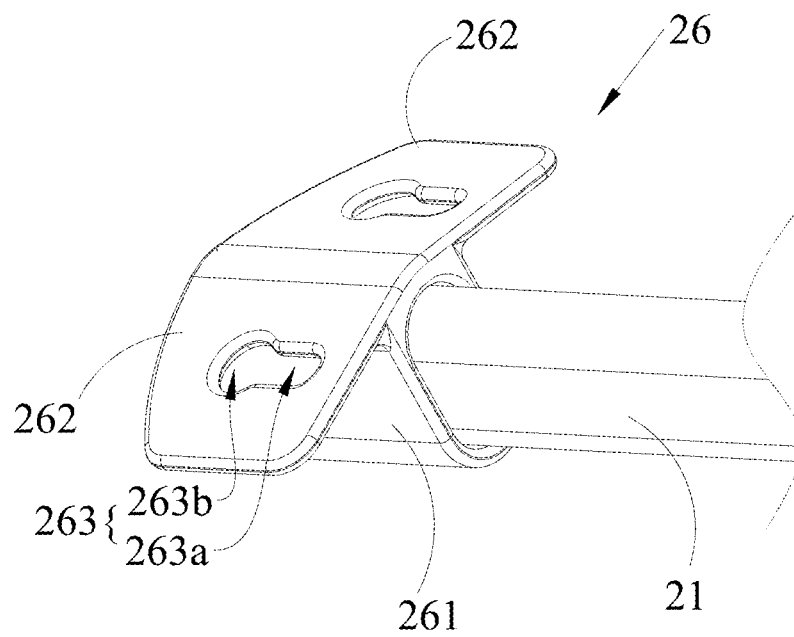


Fig. 25

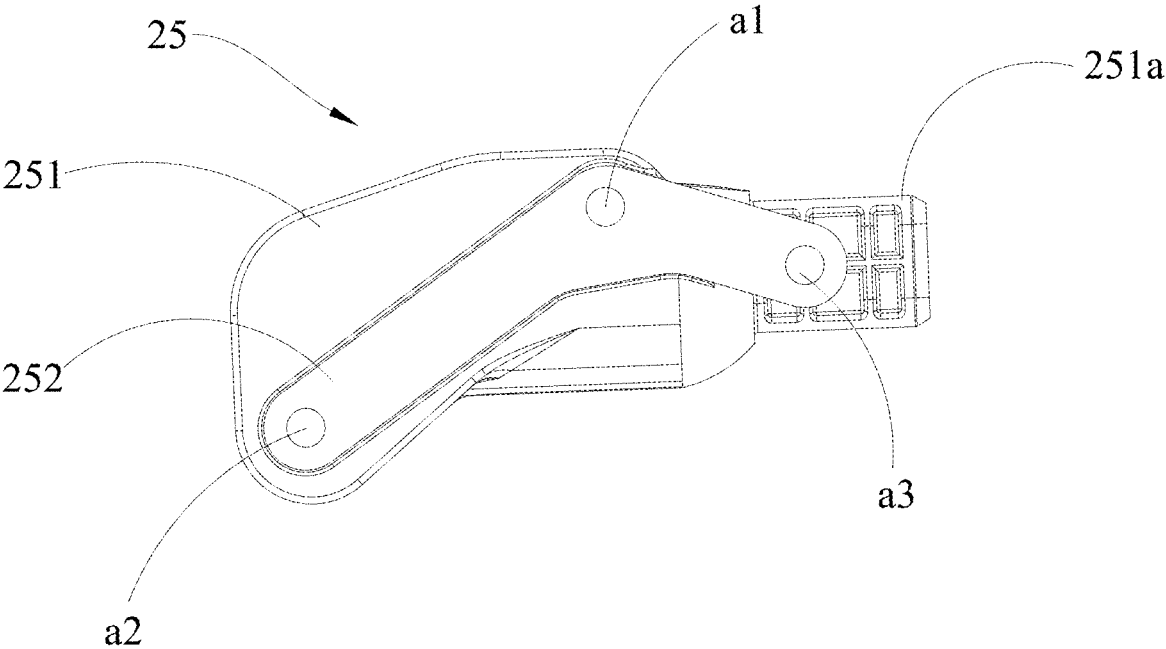


Fig. 26

FRAME FOR SHADING PRODUCT AND BEACH UMBRELLA

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application Nos. 2023109965536, 2023221244759, 2023221245022, 2023221248618, 202322124875X, 2023221299639, and 202322124522X all filed on Aug. 8, 2023, the contents all of which are incorporated by reference herein.

FIELD OF TECHNOLOGY

[0002] The following relates to outdoor products, and especially relates to a frame for a shading product and a beach umbrella having the same.

BACKGROUND

[0003] Outdoor shading products, typically beach umbrellas, are widely used in outdoor activities for sunshading or sheltering from rain. The beach umbrella usually uses a foldable frame, which can unfold or fold the sunshade umbrella, and can also be easily transported or stored. One type of beach umbrella adopts a foldable frame, which comprises a central rod located in the center and a plurality of top frame units that can be folded and unfolded, the central rod stands vertically on the ground (such as a beach), and inner end portions of the respective top frame units are connected to the upper end portion of the support rod and the respective top frame units extend radially outward along a radial direction of the central rod. Each top frame unit comprises three elongated rods, an inner end portion of a first elongated rod is hinged to an upper fixed block, an inner end portion of a second elongated rod is hinged to a lower fixed block, the upper fixed block is fixed to an upper end portion of the central rod, and the lower fixed block is fixed to the central rod and located at a distance below the upper fixed block; outer end portions of the first elongated rod and the second elongated rod are respectively hinged to different positions of a third elongated rod, and each top frame unit and the central rod form a four-bar linkage mechanism, so that each top frame unit can be folded and unfolded. However, this type of beach umbrella has the following defects: if the beach umbrella overturns on its side due to strong lateral winds or other reasons, the third elongated rod will be directly impacted. Although the third elongated rod may flip upwards to avoid direct impact, when the third elongated rod flips upwards, it will inevitably cause the first elongated rod and the second elongated rod to flip, posing a high risk of deformation or even breakage of the rods.

SUMMARY

[0004] An aspect relates to an improved frame for a shading product and a beach umbrella.

[0005] A first aspect of the present disclosure provides a frame for a shading product including:

[0006] a central rod having an upper end portion and a lower end portion for supporting or fixing on the ground, the lower end portion being located below the upper end portion;

[0007] a plurality of top frame units supported by the central rod and capable of unfolding and folding, each top frame unit comprising a first top rod and a second

top rod, and an inner end portion of each first top rod being rotatably connected to the upper end portion of the central rod;

[0008] a first slider arranged on the central rod and capable of moving in an up-down direction, the first slider being spaced apart from the upper end portion of the central rod, an inner end portion of each second top rod being rotatably connected to the first slider, and the first top rod being rotatably connected to the second top rod to form a crank-slider mechanism between the first top rod, the second top rod, the central rod, and the first slider; and

[0009] an extension rod with an inner end portion being pivotally connected to one of the top frame units to allow the extension rod to flip upwards relative to the one top frame unit when the frame overturns on its side to the ground.

[0010] In an embodiment, the frame further comprises a joint, wherein the joint is arranged on an outer end portion of one first top rod, an outer end portion of one second top rod is rotatably connected to the joint, and an inner end portion of the extension rod is rotatably connected to the joint and configured to only allow the extension rod to flip upwards relative to the one top frame unit when the frame overturns on its side to the ground. The extension rod is pivoted on the joint, and when the product falls to the ground, the extension rod will fold upwards to cushion the impact, avoiding direct impact on the end portion of the extension rod and reducing the risk of breakage or deformation of the extension rod. The extension rod increase the shading area of the frame for a shading product.

[0011] In an embodiment, the joint has an accommodating groove, and when the frame is in an unfolded state, the outer end portion of the extension rod is accommodated in the accommodating groove, and the accommodating groove has an open upper portion to allow the extension rod to flip upwards. In addition to accommodating the inner end portion of the extension rod, the accommodating groove also restrict the direction of rotation of the extension rod, and only allow the extension rod to flip upwards relative to the joint when the frame for a shading product is in the unfolded state. Specifically, the extension rod is restrained by the bottom wall of the accommodating groove to prevent them from flipping downwards.

[0012] In an embodiment, when the frame is in the unfolded state, centerlines of the extension rod and the one first top rod coincide or are parallel to each other, the extension rod is connected to the joint via a first pivot, and the first pivot is located above the centerline of the extension rod.

[0013] In an embodiment, the one second top rod is connected to the joint via a second pivot, and the second pivot is located below the centerline of the extension rod.

[0014] In an embodiment, the joint comprises a body and a metal reinforcement sheet fixedly connected to the body, and the metal reinforcement sheet is provided with pivot holes for the first pivot and the second pivot to pass through, respectively. Wherein, each top frame unit comprises two second top rods, which are connected in parallel to the respective joint, and accordingly each joint comprises two metal reinforcement sheets respectively arranged on two opposite sides of the body.

[0015] In an embodiment, the outer end portion of the extension rod is provided with a connecting sheet, and the

connecting sheet is provided with a connecting hole for connecting a cloth cover of a shading product.

[0016] In an embodiment, when the frame is in a folded state, the joint and the central rod are close to each other, the first slider and the upper end portion of the central rod are close to each other, and the inner end portions of the second top rods and the inner end portions of the first top rods are close to each other.

[0017] In an embodiment, the first top rod and the second top rod of each top frame unit, and the central rod and the first slider thereon form a crank-slider mechanism. The first top rod and a slant support rod of each top frame unit, and the central rod and a second slider thereon form another crank-slider mechanism. When the frame for a shading product is in the unfolded state, both the first top rods and the second top rods are tilted, and their inner end portions are higher than their outer end portions.

[0018] In an embodiment, the length of the first top rods is smaller than the length of the second top rods; the central rod comprises a plurality of sub rods that can be relatively retracted or detached.

[0019] In an embodiment, a spring is arranged between the upper end portion of the central rod and the first slider. The spring between the upper end portion of the central rod and the first slider provides assistance force when unfolding the frame for a shading product, which is more effort-saving when unfolding the product.

[0020] In an embodiment, wherein each top frame unit further comprises a slant support rod, and an upper end portion of the slant support rod is rotatably connected to the first or second top rod; the frame further comprises a second slider, the second slider is arranged on the central rod and capable of moving in the up-down direction, and is located below the first slider, and a lower end portion of each slant support rod is rotatably connected to the second slider; each top frame unit is connected with one extension rod.

[0021] In an embodiment, when the frame for a shading product is in the unfolded state, the first slider and the second slider are locked to each other; when the frame for a shading product is in the folded state, the first slider and the second slider are detached from each other.

[0022] In an embodiment, one of the first slider and the second slider is provided with a locking member that can deform elastically and the other one is provided with a locking groove, when the frame for a shading product is in the unfolded state, the locking member is inserted into the locking groove, and the locking member has a lug that can be matched with a groove wall of the locking groove.

[0023] In an embodiment, each top frame unit comprises two second top rods arranged in parallel. Further, the respective slant support rod passes between the two second top rods. The provision of two second top rods of each top frame unit improves the overall strength of the top frame unit, while the size of the frame for a shading product after being folded will not increase. In some embodiments, each top frame unit comprises two first top rods arranged in parallel, and the provision of two first top rods enhances the overall strength of the top frame unit.

[0024] A further aspect of the present disclosure provides a frame having an unfolded state and a folded state, which includes:

[0025] a central rod having an upper end portion and a lower end portion for supporting or fixing on the

ground, the upper end portion of the central rod being fixedly connected or integrated with a top cap;

[0026] a plurality of top frame units supported by the central rod and capable of unfolding and folding, each top frame unit comprising a first top rod and a second top rod, and an inner end portion of each first top rod being rotatably connected to the top cap;

[0027] a first slider arranged on the central rod and capable of moving in an up-down direction, the first slider being located below the top cap, and the first top rods being rotatably connected to the second top rods to form crank-slider mechanisms between the first top rods, the second top rods, the central rod, and the first slider; and

[0028] a spring in contact with or connected to the first slider;

[0029] when the frame is in the folded state, the spring is deformed, such that having a trend to drive the first slider to slide downward.

[0030] In an embodiment, the spring is arranged between the top cap and the first slider.

[0031] In an embodiment, the frame further comprises a second slider arranged on the central rod and capable of moving in the up-down direction, and the second slider is located below the first slider; each of the top frame units further comprises a slant support rod, a lower end portion of the slant support rod is rotatably connected to the second slider, and an upper end portion of the slant support rod is rotatably connected to the first top rod or the second top rod.

[0032] After the frame is folded, the spring is in a deformed state (such as compressed), so that when it is unfolded, the spring returns to drive the first slider to slide downwards, providing assistance force to slide the first slider downwards, at the same time, the first top rods and the second top rods overcome their own gravity and flip upwards relative to the central rod, providing assistance force for the unfolding of the beach umbrella or frame, making it more convenient and effort-saving to unfold.

[0033] A further aspect of the present disclosure provides an outdoor shading product comprising a frame, the frame including:

[0034] a central rod having an upper end portion and a lower end portion for supporting or fixing on the ground, the lower end portion being located below the upper end portion;

[0035] a plurality of top frame units supported by the central rod and capable of unfolding and folding with respect to each other, each top frame unit comprising a first top rod and a second top rod, and an inner end portion of each first top rod being rotatably connected to the upper end portion of the central rod, an inner end portion of each second top rod being movably connected to the central rod through a connecting block, the connecting block being located below the upper end portion of the central rod;

[0036] at least one of the top frame units is provided with two second top rods arranged in parallel, wherein an outer end portion of the first top rod is rotatably connected to an outer end portion of at least one of the two second top rods.

[0037] In an embodiment, when the outdoor shading product is in an unfolded state, the two second top rods of one top frame unit are arranged at the same level and have a gap, the first top rod directly faces the gap between the two

second top rods; each top frame unit further comprises a slant support rod, an upper end portion of the slant support rod is rotatably connected to the first top rod, a lower end portion of the slant support rod is rotatably connected to a slider, the slider is arranged on the central rod and capable of moving in the up-down direction, and is located below the connecting block, and the lower end portion of the slant support rod passes through the gap between the two second top rods.

[0038] In some embodiments, an outdoor shading product comprising a frame is provided, and the frame includes:

[0039] a central rod having an upper end portion and a lower end portion for supporting or fixing on the ground, the lower end portion being located below the upper end portion;

[0040] a plurality of top frame units supported by the central rod and capable of unfolding and folding with respect to each other, each top frame unit comprising a first top rod and a second top rod, and an inner end portion of each first top rod being rotatably connected to the upper end portion of the central rod, an inner end portion of each second top rod being movably connected to the central rod through a connecting block, the connecting block being located below the upper end portion of the central rod;

[0041] at least one of the top frame units is provided with two first top rods arranged in parallel, wherein an outer end portion of the second top rod is rotatably connected to an outer end portion of at least one of the two first top rods.

[0042] In an embodiment, when the outdoor shading product is in an unfolded state, the two first top rods of one top frame unit are arranged at the same level, and the second top rod is directly below the two first top rods or directly faces a gap between the two first top rods.

[0043] In an embodiment, each top frame unit further comprises a slant support rod, an upper end portion of the slant support rod is rotatably connected to at least one of the two first top rods, a lower end portion of the slant support rod is rotatably connected to a slider, the slider is slidably arranged on the central rod in the up-down direction, and is located below the connecting block.

[0044] The first top rod and the second top rod of each top frame unit can rotate relative to each other, and the use of two parallel first or second top rods effectively enhances the strength of the top frame unit and reduces the risk of bending, deformation, or breakage of the first and second top rods.

[0045] A fourth aspect of the present disclosure relates to a joint for a shading product, the joint is used to rotatably connected a first rod and a second rod, the joint comprise a body and a metal reinforcement sheet connected to the body, the first rod and the body are connected through a first pivot, and the second rod and the body are connected through a second pivot; the metal reinforcement sheet has at least two end portions, one of which is provided with a first pivot hole for the first pivot to pass through, and another one of which is provided with a second pivot hole for the second pivot to pass through.

[0046] A frame for a shading product using this type of joint, typically such as the frame for beach umbrellas, can rotatably connect multiple rods of the top frame units through joints, and if the top frame units are subjected to external impact after folding or during flipping, the external

force at the connection of the rods mostly acts on the joints, which avoids the deformation or breakage of the rods caused by direct impact at the end portions of the rods, improves the overall strength of the shading frame, and is beneficial for extending the service life of shading products.

[0047] The fifth aspect of the present disclosure provides an outdoor frame for a shading product comprising a central rod and a top frame that can be relatively unfolded and folded, the top frame comprises a plurality of extension rods that can rotate relative to the central rod. The frame further comprises a connecting sheet, an outer end portion of at least one extension rod is provided with the connecting sheet, and the connecting sheet comprises:

[0048] a connecting portion fixedly connected to the outer end portion of the extension rod;

[0049] a wing for connecting with an umbrella cloth, the wing being fixedly connected or integrated with the connecting portion, and the wing extending from the top of the connecting portion away from the connecting portion and being in a sheet shape.

[0050] In one embodiment, the connecting portion comprises a sleeve, which is sleeved on the outer end portion of the extension rod.

[0051] In an embodiment, the wing is provided with a hooking hole for a connecting piece of the umbrella cloth to clip in, the hooking hole has a clamping groove portion, the clamping groove portion has an opening for the connecting piece to slide in, and the opening faces the outer or lower side of the umbrella frame.

[0052] The umbrella cloth is connected to the frame through the connecting sheet, and the connecting portion is connected to the extension rod (for example, detachably connected through a screw), the thin sheet shaped wing is connected to the umbrella cloth (such as sewn together), and the umbrella cloth and the wing can have a large connection area, high connection strength, and reliable connection.

[0053] The sixth aspect of the present disclosure provides an outdoor shading product having an unfolded state and a folded state, the outdoor shading product comprises a central rod and a plurality of top frame units, and the top frame units are supported by the central rod and can be relatively unfolded and folded; the outdoor shading product further comprises:

[0054] a first slider for rotatably connecting with first rods of the top frame units, the first slider being arranged on the central rod and capable of moving in an up-down direction;

[0055] a second slider for rotatably connecting with second rods of the top frame units, the second slider being arranged on the central rod and capable of moving in an up-down direction; and

[0056] a locking mechanism used for locking the first slider and the second slider;

[0057] when the outdoor frame for a shading product is in the unfolded state, the first slider and the second slider are spaced apart from each other, and the locking mechanism is in an unlocked state; when the outdoor shading product is in the folded state, the first slider and the second slider are close to each other, and the locking mechanism locks the first slider and the second slider to each other.

[0058] In an embodiment, the locking mechanism comprises a mutually matched locking member and a locking groove, wherein the locking member and the first slider are

fixedly connected or integrated, and the locking groove is opened on the second slider, when the outdoor shading product is in the unfolded state, the locking member is inserted into the locking groove, and when the outdoor shading product is in the folded state, the locking member disengages from the locking groove.

[0059] In an embodiment, the locking member is elastic and can deform elastically, and the locking member is provided with a lug that can prevent the locking member from detaching from the locking groove. The lug extends outward from the outer surface of the locking member, and the lug has a limit surface facing upwards, and when the outdoor shading product is in the unfolded state, the limit surface and the lower surface of the second slider are opposite or against the lower surface of the first slider.

[0060] A locking mechanism is provided between the first slider and the second slider, and when the first slider and the second slider are close to each other, the locking mechanism locks, the top frame units are locked, and the outdoor shading product is stably in the unfolded state; after the locking mechanism is unlocked, the first slider and the second slider can move away from each other, the top frame units will then turn towards the central rod and move closer, there is no need to provide locking members or slots on the central rod, avoiding additional processing of the central rod and adverse effects on the strength of the central rod.

[0061] In the frame for a shading product of the present disclosure, the inner end portions of the extension rods are pivotally connected to the top frame units, when the shading product, such as a beach umbrella, overturns on its side to the ground, the extension rods flip upwards to cushion the impact force, the top frame units remain in an unfolded state, the first top rods and the second top rods thereof do not flip relative to each other, avoiding deformation or breakage of the extension rods due to significant instantaneous impact force, moreover, the rods of the top frame units do not flip relative to each other, thereby reducing the risk of deformation or breakage of the rods and improving the strength of the frame; meanwhile, the frame can be unfolded and folded, and the folded volume is small.

BRIEF DESCRIPTION

[0062] Some of the embodiments will be described in detail, with references to the following Figures, wherein like designations denote like members, wherein:

[0063] FIG. 1 shows a three-dimensional diagram of a beach umbrella according to an embodiment of the present disclosure;

[0064] FIG. 2 shows a three-dimensional diagram of another beach umbrella according to an embodiment of the present disclosure;

[0065] FIG. 3 shows a three-dimensional diagram of a frame for a shading product according to an embodiment of the present disclosure from two different perspectives;

[0066] FIG. 4 shows a three-dimensional diagram of a frame for a shading product according to an embodiment of the present disclosure from two different perspectives;

[0067] FIG. 5 shows a main view of the frame for a shading product shown in FIG. 3 and FIG. 4;

[0068] FIG. 6 shows a top view of the frame for a shading product shown in FIG. 3 and FIG. 4;

[0069] FIG. 7 shows a schematic diagram of another frame for a shading product according to an embodiment of the present disclosure from one perspective;

[0070] FIG. 8 shows a vertical cross-sectional view of the frame for a shading product shown in FIG. 7;

[0071] FIG. 9 shows a partially enlarged view of Part A in FIG. 8;

[0072] FIG. 10 shows a schematic view of the frame for a shading product shown in FIG. 7 from another perspective;

[0073] FIG. 11 shows a vertical cross-sectional view of the frame for a shading product shown in FIG. 10;

[0074] FIG. 12 shows a partially enlarged view of Part B in FIG. 11;

[0075] FIG. 13 shows a schematic view of the frame for a shading product shown in FIG. 7 during the folding process, wherein the first slider and second slider are detached from each other;

[0076] FIG. 14 shows a schematic view of the frame for a shading product shown in FIG. 13 being further folded;

[0077] FIG. 15 shows a schematic view of the frame for a shading product shown in FIG. 13 in a folded state;

[0078] FIG. 16 shows a main view of one of the top frame units when in an unfolded state;

[0079] FIG. 17 shows the main and three-dimensional view of the top frame unit shown in FIG. 16 during the folding process;

[0080] FIG. 18 shows the main and three-dimensional view of the top frame unit shown in FIG. 16 during the folding process;

[0081] FIG. 19 shows a partially enlarged view of Part C in FIG. 18;

[0082] FIG. 20 shows a main view of the top frame unit shown in FIG. 16 in a folded state;

[0083] FIG. 21 shows a structure diagram of a first slider from two different perspectives;

[0084] FIG. 22 shows a structure diagram of a first slider from two different perspectives;

[0085] FIG. 23 shows a structure diagram of a second slider from two different perspectives;

[0086] FIG. 24 shows a structure diagram of a second slider from two different perspectives;

[0087] FIG. 25 is a structure diagram of a connecting sheet; and

[0088] FIG. 26 is a structure diagram of a joint according to an embodiment of the present disclosure.

[0089] Wherein,

[0090] 100—frame for a shading product; 200—cloth cover; 201—sandbag;

[0091] 1—central rod; 11—sub rod; 12—ground nail;

[0092] 2—top frame unit; 21—first top rod; 22—second top rod; 23—extension rod; 24—slant support rod; 25—joint; 251—body; 251a—pipe plug; 252—metal reinforcement sheet; 253—impact cushion portion; 254—accommodating groove; a1—first pivot; a2—second pivot; 26—connecting sheet; 261—sleeve; 262—wing; 263—hooking hole; 263a—clamping groove portion; 263b—guide groove portion;

[0093] 3—top cap;

[0094] 4—first slider; 41—locking member; 411—lug;

[0095] 5—second slider; 51—locking groove; 511—groove wall;

[0096] 6—spring.

DETAILED DESCRIPTION

[0097] The embodiments of the present disclosure are explained below in detail combining with the accompanying drawings so that the advantages and features of the present

disclosure can be easily understood by the skilled persons in the art. It should be noted that the explanation on these implementations is to help understanding of the present disclosure, and is not intended to limit the present disclosure. Further, the technical features involved in the various embodiments of the present disclosure described below may be combined with each other as long as they do not conflict with each other.

[0098] It should be noted that the orientation words “up”, “down”, “inner”, and “outer” mentioned herein are described based on the position of the components when the frame for a shading product is in the unfolded state; “up” and “down” can be seen on the upper and lower sides of the paper in FIG. 5; “inner” and “outer” are defined with the central rod as a reference, “inner” specifically refers to the side or portion of a component closer to the central rod, and “outer” specifically refers to the side or portion of the component farther from the central rod.

[0099] The following embodiments provide frames for a shading product that can provide shading space outdoors for sunshading or sheltering from rain. The frame for a shading product is foldable, has both unfolded and folded states, suitable for foldable shading products. Typically, the shading product can be a beach umbrella. The following embodiments provide a beach umbrella using this frame for a shading product, which can be used in places such as beaches.

[0100] As shown in FIG. 1 and FIG. 2, the beach umbrella comprises an umbrella frame and a cloth cover 200, the umbrella frame is specifically a frame for a shading product 100 described in detail below, and the cloth cover 200 is fixed to the frame for a shading product 100; when the frame for a shading product 100 is in the unfolded state, the cloth cover 200 is stretched to provide a larger shading area. The cloth cover 200 is provided with several sandbags 201 or connected to several sandbags 201 to further stabilize the cloth cover 200.

[0101] As shown in FIG. 3 to FIG. 6, the frame for a shading product 100 comprises a central rod 1 and a plurality of top frame units 2. The central rod is vertically arranged, and has an upper end portion and a lower end portion for supporting or fixing on the ground. When in use, the central rod 1 stands vertically on the ground and the lower end portion is fixed to the ground. Furthermore, the central rod 1 can be retracted or comprise a plurality of detachable sub rods 11, thereby having a smaller volume before assembly or after folding, reducing space occupation, and facilitating transportation or storage. Specifically, in this embodiment, the central rod 1 comprises three detachable sub rods 11, which are sequentially connected by screws or other fasteners, and before assembly, the three sub rods 11 are separated from each other to save packaging space. The lowest sub rod 11 can also be connected to a ground nail 12 for easy insertion into the ground. The plurality of top frame units 2 is supported by the central rod 1 and capable of unfolding and folding with respect to each other.

[0102] The upper end portion of the central rod 1 is fixedly connected or integrated with a top cap 3. The frame for a shading product 100 further comprises a first slider 4 and a second slider 5. The first slider 4 is movably arranged on the central rod 1 in an up-down direction, and the first slider 4 is located below the top cap 3. The second slider 5 is movably arranged on the central rod 1 in an up-down direction, and the second slider 5 is located below the first

slider 4. Specifically, in this embodiment, the first slider 4 and the second slider 5 are sliding sleeves respectively sleeved on the central rod 1, and both are sleeved on the uppermost sub rod 11 in a manner that can slide up and down. The top cap 3, the first slider 4, and the second slider 5 are arranged from top to bottom.

[0103] In an embodiment, as shown in FIG. 7 to FIG. 12, the frame for a shading product 100 further comprises a spring 6, which is specifically a compression spring arranged between the top cap 3 and the first slider 4. The spring 6 is specifically sleeved on the central rod 1, with its upper end contacting the top cap 3 and its lower end contacting the first slider 4. When the frame for a shading product 100 is in the folded state, the spring 6 is deformed and has a trend to push the first slider 4 to slide downwards and away from the top cap 3, providing assistance force for the frame for a shading product 100 to unfold, making it easier for consumers to unfold the beach umbrella. When the frame for a shading product 100 is folded, each top frame unit 2 flips down and moves closer to the central rod 1 under its own gravity and/or the pulling force of the consumer, the first slider 4 is slid up relative to the top cap 3, and the spring 6 between them is in a compressed state.

[0104] One end portion of each top frame unit 2 is connected to the central rod 1, while the other end portion extends radially outward along the radial direction of the central rod 1, and the plurality of top frame units 2 is arranged at equal intervals along the circumferential direction of the central rod 1, so that the plurality of top frame units 2 are in a radial configuration. Each top frame unit 2 can be unfolded and folded, so that the entire frame for a shading product 100 can be folded, as shown in FIG. 13 to FIG. 15. In this embodiment, it specifically comprises four top frame units 2. The structure of each top frame unit 2 is same, and from a top view, the four top frame units 2 form a cross shaped shape centered on the central rod 1. Below is a detailed description using one of the top frame units 2 as an example.

[0105] In combination with the above FIGS. and as shown in FIG. 14 to FIG. 18, each top frame unit 2 comprises a first top rod 21, a second top rod 22, a slant support rod 24 and a joint 25, and each top frame unit 2 is further connected to an extension rod 23. The inner end portion of the extension rod 23 is pivotally connected to the top frame unit 2 to allow the extension rod 23 to flip upwards relative to the top frame unit 2 when the frame 100 overturns on its side to the ground. The inner end portion of the first top rod 21 is rotatably connected to the top cap 3; the joint 25 is arranged at the outer end portion of the first top rod 21, and the two are fixedly connected or integrated. The inner end portion of the second top rod 22 is rotatably connected to the first slider 4, and the outer end portion of the second top rod 22 is rotatably connected to the joint 25. The inner end portion of the extension rod 23 is rotatably connected to the joint 25, and the outer end portion thereof extends outward and is provided with a connecting sheet 26, the connecting sheet 26 is provided with a connecting hole or groove to facilitate connection with the cloth cover 200, providing a larger shading area. The upper end portion of the slant support rod 24 is rotatably connected to the first top rod 21 or the second top rod 22, and the lower end portion of the slant support rod 24 is rotatably connected to the second slider 5. Specifically, in this embodiment, the first top rod 21 of each top frame unit 2 is pivotally connected with the top cap 3, the second

top rod 22 of each top frame unit 2 is pivotally connected with the first slider 4, and the slant support rod 24 of each top frame unit 2 is pivotally connected with the second slider 5. As shown in FIG. 12, the extension rod 23 is connected to the joint 25 via a first pivot a1, and the second top rod 22 is connected to the joint 25 via a second pivot a2, the first top rod 21 and the second top rod 22 of each top frame unit 2, and the central rod 1 and the first slider 4 thereon form a crank-slider mechanism; the first top rod 21 and the slant support rod 24 of each top frame unit 2, and the central rod 1 and the second slider 5 thereon form another crank-slider mechanism.

[0106] Furthermore, in this embodiment, each top frame unit 2 comprises two second top rods 22, which are connected in parallel between the same joint 25 and first slider 4 to enhance the strength of the top frame unit 2. There is a gap between the two second top rods 22, and the slant support rod 24 passes between the two second top rods 22 and is respectively connected to the first top rod 21 and the second slider 5. The length of the slant support rod 24 is less than that of the first top rod 21 and the second top rod 22, and the distance between the connection of the slant support rod 24 and the first top rod 21 and the outer end portion of the first top rod 21 shall be less than half of the length of the first top rod 21, and the sum of this distance and the length of the slant support rod 24 shall be less than or equal to the length of the second top rod 22. In addition, the difference in length between the first top rod 21 and the second top rod 22 is less than one tenth of the length of the second top rod 22; the length of the first top rod 21 is less than the length of the second top rod 22. When the frame for a shading product 100 is in the folded state, the upper end portion of the first top rod 21 and the upper end portion of the second top rod 22 are close to each other (the two are basically at the same level, or the height difference is much less than $\frac{1}{10}$ of the length of the first top rod 21), and the lower end portion of the first top rod 21 is higher than the upper end portion of the second top rod 22. When the frame for a shading product 100 is in the folded state, in each top frame unit 2, the slant support rod 24 is accommodated between the two second top rods 22 to make full use of the internal space and avoid the excessive overall volume after folding.

[0107] In some other embodiments, each top frame unit 2 comprises two first top rods 21, while one second top rod 22. The two first top rods 21 are connected in parallel between the same joint 25 and the top cap 3 to enhance the strength of the top frame unit 2. The slant support rod 24 is rotationally connected with at least one of the first top rods 21.

[0108] Further, in addition to rotatably connecting the extension rod 23 to the first top rod 21 and the second top rod 22, the joint 25 also has a limiting function in the rotation of the extension rod 23; specifically, the joint 25 is configured to only allow the extension rod 23 to flip upwards relative to the top frame unit 2 when the frame for a shading product overturns on its side to the ground. As shown in FIG. 9 and FIG. 19, the joint 25 has an accommodating groove 254, and the outer end portion of the extension rod 23 is accommodated in the accommodating groove 254 when the frame for a shading product 100 is in the unfolded state. The upper portion of the accommodating groove 254 is open to allow the extension rod 23 to rotate and detach from the accommodating groove 254, while being close to the first top rod 21. When the shading product is in the unfolded state, the centerline of the extension rod 23 and the center-

line of the first top rod 21 coincide or are parallel to each other, and the accommodating groove 254 extends along the centerline of the extension rod 23. The upper portion and the outer end of the accommodating groove 254 are open, the bottom of the accommodating groove 254 is closed, and when the frame for a shading product 100 is in the unfolded state, the extension rod 23 leans against the lower portion of the accommodating groove 254, the bottom wall of the accommodating groove 254 has a rotation limit effect on the extension rod 23, which can prevent the extension rod 23 from flipping downwards, and the extension rod 23 can be flipped upwards to be close to the first top rod 21. When the frame for a shading product 100 is in the unfolded state, the first pivot a1 is located above the centerline of the extension rod 23, and the second pivot a2 is located below the centerline of the extension rod 23.

[0109] The joint 25 has an impact cushion portion 253 that lands on the ground when the frame for a shading product 100 overturns on its side, when the frame for a shading product 100 overturns on its side to the ground or is placed tilted to the ground, the impact cushion portion 253 of the joint 25 lands on the ground to support the entire frame; at this time, the impact cushion portion 253 protrudes outward relative to the first pivot a1, the second pivot a2, the inner end portion of the extension rod 23 and the outer end portion of the second top rod 22, which effectively avoids the end portions of the rods (especially the outer end portion of the second top rod 22) from directly touching the ground, thereby reducing the risk of bending, deformation, or breakage of the rods.

[0110] The joint 25 comprises a body 251 and a metal reinforcement sheet 252 fixedly connected to the body 251, and the body 251 is a plastic member that can be processed using an integral injection molding process. The metal reinforcement sheet 252 can be made of alloy sheets with better strength such as steel sheets. Further, the metal reinforcement sheet 252 extends from the first pivot a1 to the second pivot a2, and the two end portions of the metal reinforcement sheet 252 are respectively provided with pivot holes for the first pivot a1 and the second pivot a2 to pass through. The first pivot a1 passes through upper end portions of the body 251 and the metal reinforcement sheet 252, the second pivot a2 passes through lower end portions of the body 251 and the metal reinforcement sheet 252, and the metal reinforcement sheet 252 can be connected to the body 251 via the first pivot a1 and the second pivot a2, effectively strengthening the connection strength between the first top rod 21, the second top rod 22, and the extension rod 23. In this embodiment, each top frame unit 2 comprises two second top rods 22, which are connected in parallel to the joint 25, and accordingly there are two metal reinforcement sheets 252 respectively arranged on two opposite sides of the body 251. The body 251 of joint 25 further has a pipe plug 251a, the pipe plug 251a is inserted into the outer end portion of the first top rod 21 and fixed to the first top rod 21 through a fastener such as a screw or a rivet.

[0111] In some other embodiments, as shown in FIG. 26, the metal reinforcement sheet 252 has three end portions and is overall L-shaped. Two of the end portions of the metal reinforcement sheet 252 are provided with pivot holes for the first pivot a1 and the second pivot a2 to pass through, respectively; the third end portion is provided with a connecting hole, through which a fastener a3 such as a screw or a rivet passes and fixedly connects the joint 25 (specifically

the pipe plug **251a** and the third end portion of the metal reinforcement sheet **252**) to the outer end portion of the first top rod **21**. The strength of the connection between the first top rod **21**, the second top rod **22**, and the extension rod **23** is effectively strengthened.

[0112] As shown in FIG. 3, FIG. 5, FIG. 7, FIG. 8, and FIG. 16, the outer end portion of each extension rod **23** is provided with a connecting sheet **26**, for conveniently connecting the cloth cover **200** of the shading product. In some embodiments, the cloth cover **200** is composed of a top cloth, which is covered above the top frame, and its outer edge is connected to the connecting sheets **26** on the plurality of top frame units **2**; in other embodiments the cloth cover **200** further comprises enclosing cloths, which are suspended downwards from the outer edge of the top frame units **2**, and the upper edge of each enclosing cloth is connected to at least two adjacent connecting sheets **26** of the top frame units **2**; the connecting pieces **26** realize the connection between the top cloth and the enclosing cloths and the umbrella frame **100**. Specifically, as shown in FIG. 25, the connecting sheet **26** comprises a sleeve **261**, which is detachably sleeved on the outer end portion of the extension rod **23**; further, the sleeve **261** is fixed to the extension rod **23** through a fastener (such as a screw). The connecting sheet **26** further comprises one or more wings **262**, which are fixedly connected or integrated with the sleeve **261**. The wing(s) **262** are generally in a thin sheet shape, roughly parallel to the cloth cover. Each connecting sheet **26** has two wings **262**, which extend horizontally from the sleeve **261** to different sides, that is, the two wings **262** are located on opposite sides of the sleeve **261**. The top cloth and the wings **262** are connected by sewing, and the wings **262** can be provided with one or more turns of sewing portions with reduced thickness.

[0113] Hooking holes **263** are provided on the wings **262** to facilitate the connection of the enclosing cloths. In this embodiment, the hooking holes **263** run through the wings **262** in the up-down direction. The hooking holes **263** has clamping groove portions **263a**, and the clamping groove portions **263a** has openings facing the outer or lower sides of the umbrella frame. The hooking holes **263** further have guide groove portions **263b**, which are connected to the clamping groove portions **263a** through the above openings; the hole diameter or width of the guide groove portion **263b** is greater than that of the clamping groove portions **263a**, and the overall hooking hole **263** is in the shape of a gourd; further, the guide groove portions **263b** are circular holes, and the clamping groove portions **263a** are U-shaped holes. In some other embodiments, the hooking holes **263** are only composed of clamping groove portions **263a**, and the openings are opened on the outer edge of the connecting sheet **26**, that is, the clamping groove portions **263a** extend inward from the edge of the connecting sheet **26**, thereby facilitating the connection pieces on the enclosing cloths to slide in.

[0114] The enclosing cloths of the outdoor shading product mentioned above is connected with several connecting pieces, which comprise connecting pins, and side walls of the connecting pins have recessed portions (such as circular grooves). When mounting the enclosing cloths, the connecting pins are inserted into the guide groove portions **263b** and slid into the clamping groove portions **263a** from the openings or are directly slid into the clamping groove portions **263a** from the openings, and the recessed portions are stuck on the wings **262** to prevent the connecting pins

from sliding out of the clamping groove portions **263a**. This embodiment is different from the conventional connection method between the cloth cover and the frame, and has good connection strength. Not only is the connection of the cloth cover convenient, but also the connection is reliable, reducing the risk of tearing or damage to the connections between the cloth cover and the rods during the folding or unfolding process of the rods. After the umbrella frame is unfolded, under the tension of the umbrella cloth itself, the connecting pins remain in a state of mutual clamping with the connecting sheet **26**, without sliding out from the openings.

[0115] The frame for a shading product **100** is provided with a locking mechanism. When the frame for a shading product **100** is in the unfolded state, the locking mechanism is in a locked state, and the first slider **4** and the second slider **5** are locked to each other. When the frame for a shading product **100** is in the folded state, the locking mechanism is in an unlocked state, and the first slider **4** and the second slider **5** are detached from each other. As shown in FIG. 18 to FIG. 22, one of the first slider **4** and the second slider **5** has a locking member **41** capable of deforming elastically, and the other one is provided with a locking groove **51**, and the locking mechanism comprises the locking member **41** and the locking groove **51**. When the frame for a shading product **100** is in the unfolded state, the locking member **41** is inserted into the locking groove **51**, and the locking member **41** has a lug **411** that is matched with the groove wall of the locking groove **51**. Specifically, in this embodiment, as shown in FIG. 12, the first slider **4** has a pair of downward extending locking members **41**, and lower portions of the locking members **41** are further provided with lugs **411** protruding outwards; the second slider **5** has locking grooves **51** that runs through up and down, the locking members **41** can be inserted into the locking grooves **51**, the lugs **411** can be clamped by groove walls **511** facing downwards of the second slider **5**, and after the locking members **41** are inserted into the locking grooves **51** and locked in place, the upper surfaces of the lugs **411** can press against the groove walls **511**, thereby avoiding the locking members **41** from sliding out. When unlocking, the lugs **411** are pressed inward to avoid the limitations of the groove walls **511** mentioned above, and the locking members **41** can slide out of the locking grooves **51**. Further, the outer surfaces of the lugs **411** further have guide slopes for easy insertion into the locking grooves **51**. By providing a locking mechanism between the first slider **4** and the second slider **5**, there is no need to provide locking members or slots on the central rod **1**, avoiding additional processing of the central rod **1**, and also avoiding adverse effects on the strength of the central rod **1**.

[0116] As shown in the above accompanying drawings, when the frame for a shading product **100** is in the unfolded state, the ground nail **12** at the bottom of the central rod **1** can be fixed in the ground, and it is further fixed through the sandbag **201** of the cloth cover **200**; the plurality of top frame units **2** are unfolded outward, and the cloth cover **200** is stretched; the first slider **4** is located at a distance below the top cap **3**, the second slider **5** is close to and locked with the first slider **4**, and the spring **6** can be in its initial state; the inner end portion of the extension rod **23** is located in the accommodating groove **254** of the joint **25**, the centerlines of the extension rod **23** and the first top rod **21** are collinear, and the centerlines of the two second top rods **22** are located on opposite sides of the centerline of the first top rod **21** from

a top view. Both the first top rod **21** and the second top rods **22** are tilted, and their inner end portions are higher than their outer end portions. The slant support rod **24** is also arranged obliquely, and the outer end portion is higher than the inner end thereof.

[0117] When the frame for a shading product **100** is in a folded state, each top frame unit **2** is close to the central rod **1**. Specifically, the joint **25** of each top frame unit **2** and the central rod **1** (specifically the lower end portion of the uppermost sub rod **11**) are close to each other, that is, the outer end portion of the first top rod **21**, the outer end portion of the second top rod **22**, the slant support rod **24** and the extension rod **23** are close to the central rod **1**; the first slider **4** and the second slider **5** are detached from each other and slide upwards until they are close to the top cap **3**, and the spring **6** is compressed; the inner end portion of the second top rod **22** and the inner end portion of the first top rod **21** are close to each other.

[0118] When the frame for a shading product **100** is folded, the lugs **411** on the two locking members **41** are pressed inwards, the second slide **5** is moved downwards and is detached from the first slide **4**, driving the slant support rod **24** to close to the central rod **1**, so that the first top rod **21** and the second top rod **22** are then close to the central rod **1**, and at the same time, the first slide **4** is pushed upward to close to the top cap **3**; finally, the extension rod **23** is flipped upwards and close to the first top rod **21** to complete the folding of the frame. When the above shading product is unfolded, the extension rod **23** is flipped downwards to unfold, pushing the second slider **5** upwards, at the same time, with the assistance of the reset force of the spring **6**, the first slider **4** is slid downwards until the locking members **41** are inserted into the second slider **5**, each top frame unit **2** is fully unfolded, and the entire frame is directly locked in the unfolded state.

[0119] The frame for a shading product **100** of this embodiment can be applied to outdoor shading products such as beach umbrellas, and when the shading product falls to the ground, the extension rod **23** flips upwards to cushion the impact force and improve the strength of the frame, meanwhile the top frame unit **2** does not need to be deformed or folded. The frame for a shading product **100** can be unfolded and folded, and the folded volume is small. Wherein, two second top rods **22** of each top frame unit **2** are provided, improving the overall strength of the top frame units, while the size of the frame for a shading product **100** after being folded will not increase. In addition, the spring **6** between the top cap **3** and the first slider **4** provides assistance when unfolding the frame for a shading product **100**, which is more labor-saving when unfolding the product. Except for the extension rod **23**, the entire top frame unit **2** is linked with the first slider **4** and the second slider **5**, making it easier to unfold and fold; while the extension rod **23** is pivotally connected to the joint **25**, when the product falls to the ground, the extension rod **23** will flip upwards to cushion the impact, avoiding direct impact on the end portion of the extension rod **23** and reducing the risk of breakage or deformation of the extension rod **23**.

[0120] As shown in the description and the claims, the terms “comprising” and “including” only indicate the steps and elements that have been clearly identified, and these steps and elements do not constitute an exclusive list, a method or device may further comprise other steps or

elements. The term “and/or” used herein includes any combination of one or more related listed items.

[0121] It should be noted that, unless otherwise specified, when a feature is referred to as “fixed” or “connected” to another feature, it can be directly fixed or connected to another feature, or indirectly fixed or connected to another feature. In addition, the descriptions such as upper, lower, left, and right used in the present disclosure are only relative to the mutual positional relationships of the various components of the present disclosure in the accompanying drawings.

[0122] It can be further understood that the terms “first”, “second”, etc. are used to describe various information, but this information should not be limited to these terms. These terms are only used to distinguish the same type of information from each other and do not indicate a specific order or degree of importance. In fact, expressions such as “first” and “second” can be used interchangeably. For example, without departing from the scope of the present disclosure, the first information can also be referred to as the second information, and similarly, the second information can also be referred to as the first information.

[0123] Although the present invention has been disclosed in the form of embodiments and variations thereon, it will be understood that numerous additional modifications and variations could be made thereto without departing from the scope of the invention.

[0124] For the sake of clarity, it is to be understood that the use of ‘a’ or ‘an’ throughout this application does not exclude a plurality, and ‘comprising’ does not exclude other steps or elements.

1. A frame for a shading product, comprising:
 - a central rod having an upper end portion and a lower end portion for supporting or fixing on the ground, the lower end portion being located below the upper end portion;
 - a plurality of top frame units supported by the central rod and capable of unfolding and folding, each top frame unit comprising a first top rod and a second top rod, and an inner end portion of each first top rod being rotatably connected to the upper end portion of the central rod;
 - a first slider arranged on the central rod and capable of moving in an up-down direction, the first slider being spaced apart from the upper end portion of the central rod, an inner end portion of each second top rod being rotatably connected to the first slider, and the first top rod being rotatably connected to the second top rod; and
 - an extension rod with an inner end portion being pivotally connected to one of the top frame units to allow the extension rod to flip upwards relative to the one top frame unit when the frame overturns on its side to the ground.
2. The frame as in claim 1, further comprising a joint, wherein the joint is arranged on an outer end portion of one first top rod, an outer end portion of one second top rod is rotatably connected to the joint, and an inner end portion of the extension rod is rotatably connected to the joint and configured to only allow the extension rod to flip upwards relative to the one top frame unit when the frame overturns on its side to the ground.
3. The frame as in claim 2, wherein the joint has an accommodating groove, and when the frame is in an unfolded state, the outer end portion of the extension rod is

accommodated in the accommodating groove, and the accommodating groove has an open upper portion to allow the extension rod to flip upwards.

4. The frame as in claim 2, wherein when the frame is in the unfolded state, centerlines of the extension rod and the one first top rod coincide or are parallel to each other, the extension rod is connected to the joint via a first pivot, and the first pivot is located above the centerline of the extension rod.

5. The frame as in claim 4, wherein the one second top rod is connected to the joint via a second pivot, and the second pivot is located below the centerline of the extension rod.

6. The frame as in claim 5, wherein the joint comprises a body and a metal reinforcement sheet fixedly connected to the body, and the metal reinforcement sheet is provided with pivot holes for the first pivot and the second pivot to pass through, respectively.

7. The frame as in claim 2, wherein when the frame is in a folded state, the joint and the central rod are close to each other, the first slider and the upper end portion of the central rod are close to each other, and the inner end portions of the second top rods and the inner end portions of the first top rods are close to each other.

8. The frame as in claim 7, wherein a length of the first top rods is smaller than a length of the second top rods; the central rod comprises a plurality of sub rods that can be relatively retracted or detached, and the central rod further comprises a ground nail arranged on a lowermost sub rod.

9. The frame as in claim 1, wherein a spring is arranged between the upper end portion of the central rod and the first slider.

10. The frame as in claim 1, wherein each top frame unit further comprises a slant support rod, and an upper end portion of the slant support rod is rotatably connected to the first or second top rod; the frame further comprises a second slider, the second slider is arranged on the central rod and capable of moving in an up-down direction, and is located below the first slider, and a lower end portion of each slant support rod is rotatably connected to the second slider; each top frame unit is connected with one extension rod.

11. The frame as in claim 10, wherein when the frame is in the unfolded state, the first slider and the second slider are locked to each other; when the frame is in the folded state, the first slider and the second slider are detached from each other; one of the first slider and the second slider is provided with a locking member that can deform elastically and the other one is provided with a locking groove, when the frame is in the unfolded state, the locking member is inserted into the locking groove, and the locking member has a lug that matches with a groove wall of the locking groove.

12. The frame as in claim 10, wherein each top frame unit comprises two second top rods arranged in parallel, and the slant support rod passes between the two second top rods; or each top frame unit comprises two first top rods arranged in parallel.

13. A beach umbrella comprising an umbrella frame and a cloth cover, the umbrella frame including the frame as in claim 1.

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