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(54) **Titre : TENTE PLIABLE**
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(57) **Abrésumé/Abstract:**

An instant tent with an integral vent and rain fly for providing the tent with continuous ventilation while protecting the vent and interior of the tent from adverse weather conditions. The instant tent includes a hub assembly having a base with a plurality of slots formed on the base. Each slot is formed by a pair of side walls which are integrally formed on the base and includes a pivoting axis formed substantially normal between the corresponding pair of side walls. Poles are connected to opposing side walls of each corresponding slot for pivotal movement between an open configuration and a closed configuration. Thus, the instant tent of the present invention is provided with secure and continuous ventilation, and is easily opened and closed without requiring additional assembly of components.



ABSTRACT

An instant tent with an integral vent and rain fly for providing the tent with continuous ventilation while protecting the vent and interior of the tent from adverse weather conditions. The instant tent includes a hub assembly having a base with a plurality of slots formed on the base. Each slot is formed by a pair of side walls which are integrally formed on the base and includes a pivoting axis formed substantially normal between the corresponding pair of side walls. Poles are connected to opposing side walls of each corresponding slot for pivotal movement between an open configuration and a closed configuration. Thus, the instant tent of the present invention is provided with secure and continuous ventilation, and is easily opened and closed without requiring additional assembly of components.

FOLDABLE TENT

FIELD AND BACKGROUND

[0002] The present invention relates to a foldable tent and more particularly to an instant tent with an integrated ventilation system and rain fly, and an improved hub assembly for the same.

[0003] For novice campers, foldable tents are a popular alternative to conventional assemble-to-use tents. Foldable tents, which are commonly referred to as “instant tents,” “one-touch tents” or “pop-up tents,” are sold preassembled, making opening and closing of the tent easy and less time consuming. Instant tents are sold in several different designs. One type of instant tent, for example, is manufactured and sold as a structure similar to that of a conventional umbrella as shown, for example, in U.S. Patent No. 6,581,617. In those structures, the tent is opened and collapsed by movable sub-braces which are pivotally connected to a central shaft. These structures often have locking mechanisms on the central shaft to maintain the tent in the open state. Umbrella type instant tents, however, are problematic for a number of reasons which include but are not limited to: (1) the additional costs in manufacturing due to the parts required for the tent, i.e., the central shaft, sub-braces and locking mechanism, as well as increased labor to assemble those parts; (2) the increased potential for failure and necessary repair of the central shaft, sub-braces and locking mechanism; and (3) the increased size and weight of the tent due to the extra components.

- **[0004]** Instant tents are easily foldable because of the foldable and retractable nature of the poles, and the poles being pivotable within a central hub assembly. Hub assemblies of foldable tents are known in the art and continue to develop and evolve. For example, an instant tent that does not require a central shaft, sub-braces or locking mechanism was developed. As described in U.S. Patent Application No. 12/658,473 (“the ‘473 Application”), the poles are pivotally connected directly to the hub, and pivot to and from open and closed configurations without additional components. Even though the instant tent described in the ‘473 Application solved many of the problems associated with umbrella type instant tents as well as the disadvantages in other instant tents, there was room for improvement to develop a better design to accommodate the user. As well, other shortcomings were discovered through manufacture and use of the new hub assembly.

[0005] Hub assemblies are generally circular in shape and the slots formed on the hub assembly to house each pole are generally arranged radially such that each slot is spaced apart circumferentially. Because the hub assemblies are manufactured to a compact size, the space provided between adjacent slots is minimal. Therefore, when the hub assembly is manufactured with many poles (e.g., more than four poles), the hub assembly must be expanded radially outward to accommodate for additional slots, thus increasing manufacturing cost.

[0006] Hub assemblies in the prior art are also manufactured with fasteners for forming a pivoting axis for each pole. The fasteners, often metal screws, could be exposed through gaps formed between the poles and corresponding side walls, as well as portions of the screw which may protrude from either outer side of the side walls. Therefore, during factory assembly and/or opening and folding the tent by the user, the tent fabric could become damaged from contact with the metal screws. In addition, substantial manual labor is required to assemble each pole

- with the fasteners.

[0007] Most instant tents in general also lack sufficient ventilation. For most novice campers, tents are used during the summer season and often times the interior of the tent becomes uncomfortably warm and sometimes even hot. Moreover, condensation can develop due to the lack of air circulation. Even though tents are commonly equipped with screen windows or doors on one or more sides of the tent, it is difficult to achieve sufficient ventilation unless a wind or draft is blowing directly into an open window or door and out another open window or door. When adverse weather conditions are present, such as rain or snow, the windows and doors must be closed to prevent rain or snow from entering the tent and thus the interior of the tent cannot ventilate. Furthermore, when a user wishes to close the windows or doors for other reasons such as for safety or privacy it is difficult to ventilate the interior of the tent.

[0008] Moreover, even though some instant tents are sold with a separate cover or fly to protect the tent from adverse weather conditions such as rain, sleet or snow, or to provide shade from the sun light, the cover or fly is not integrated with the instant tent and, thus, the user is required to separately attach and detach the cover or fly to and from the instant tent. In addition, because the rain fly typically covers most of the tent including the windows, it is not possible to achieve proper ventilation.

[0009] A need exists, therefore, for an instant tent with sufficient ventilation. A need also exists for a hub assembly capable of housing many poles without significantly increasing the overall volume of the hub assembly. A further need exists for a hub assembly manufactured without hardware which could cause potential damage to other components of the tent. Moreover, a need exists for a hub assembly capable of easy assembly during the manufacturing process.

BRIEF SUMMARY OF THE INVENTION

[0010] The following presents a simplified summary of some embodiments of the invention in order to provide a basic understanding of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some embodiments of the invention in a simplified form as a prelude to the more detailed description that is presented later.

[0011] The present invention is intended to overcome at least the above-described disadvantages and to provide further improvements to instant tents in the prior art. For achieving these objects, the present invention provides an instant tent, convertible between open and closed configurations, comprising a central hub with a base having an engaging surface. First and second sets of slots are formed on the engaging surface of the base, and each slot is formed by first and second slot walls and the engaging surface of the base. Each of the first and second slot walls extend independently from the engaging surface of the base and substantially parallel to each other. The first set of slots comprises at least three slots spaced apart radially and the second set of slots comprises at least one slot disposed between adjacent slots of the first set. The instant tent further comprises at least one eave pole corresponding to the number of slots of the second set of slots. Each eave pole has first and second ends and each eave pole first end is pivotally coupled to a corresponding slot of the second set. The instant tent further comprises a plurality of roof poles corresponding to the number of slots of the first set of slots. Each roof pole has a first and second end and each roof pole first end is pivotally coupled to a corresponding slot of the first set. The instant tent further comprises a plurality of leg poles corresponding to the number of roof poles. Each leg pole has a middle section and a lower section and each middle and lower section has a first end and a second end. Each roof pole second end is coupled to a corresponding middle section first end, and said middle section

- second end is coupled to a corresponding lower section first end. The instant tent further comprises a canopy having a plurality of adjoining canopy walls and a floor coupled together at seams to form an enclosure. Each canopy wall has a top, bottom and two side portions and at least one of the canopy walls has a vent. The canopy is continuously connected to the roof poles and leg poles in the open and closed configurations. The instant tent further comprises at least one rain fly disposed proximate the vent. The at least one rain fly has a plurality of perimeters and the at least one rain fly is continuously connected to the canopy and corresponding eave pole in the open and closed configurations.

[0012] In one embodiment of the present invention, the instant tent of the present invention includes a hub assembly comprising a base having first and second surfaces. The hub assembly further comprises first and second sets of slots. The first set of slots comprises at least three slots spaced apart radially and the second set of slots comprises at least one slot disposed between adjacent slots of the first set. Each slot is formed by first and second slot walls, and each of the first and second slot walls extend independently from the first surface of the base and substantially parallel to each other. Each slot wall also has an inner and outer end. The hub assembly also comprises a plurality of roof poles corresponding to the number of slots of the first set of slots. Each roof pole has a first and second end and each roof pole first end is pivotally coupled to first and second slot walls of a corresponding slot of the first set. The hub assembly further comprises at least one eave pole corresponding to the number of slots of the second set of slots. Each eave pole has first and second ends and each eave pole first end is pivotally coupled to first and second slot walls of a corresponding slot of the second set. In the open configuration the first ends of each roof pole and eave pole engage the first surface of the base, and in the closed configuration said first ends are disengaged from the first surface of the base and pivoted

· substantially perpendicular to said top surface.

[0013] In another embodiment of the present invention, the instant tent includes a hub assembly comprising a base having first and second surfaces, and first and second sets of slots. The first set of slots comprises at least three slots spaced apart radially. The second set of slots comprises at least one slot disposed between adjacent slots of the first set. Each slot is formed by first and second slot walls and each of the first and second slot walls extend independently from the second surface of the base and substantially parallel to each other. Each slot wall has an inner and outer end. The hub assembly further comprises a plurality of roof poles corresponding to the number of slots of the first set of slots. Each roof pole has a first and second end. Each roof pole first end is pivotally coupled to first and second slot walls of a corresponding slot of the first set. The hub assembly further comprises at least one eave pole corresponding to the number of slots of the second set of slots. Each eave pole has first and second ends and each eave pole first end is pivotally coupled to first and second slot walls of a corresponding slot of the second set. In the open configuration the first ends of each roof pole and eave pole engage the second surface of the base, and in the closed configuration said first ends are disengaged from the second surface of the base and pivoted substantially perpendicular to the base.

[0014] The present invention also provides a hub assembly for opening and closing a tent between an open configuration and a closed configuration comprising a base having at least one planar engaging surface; a plurality of slots formed on the base, each slot formed by a pair of side walls extending substantially normal from the plane of the engaging surface and integrally formed on the base, the side walls of each pair being substantially parallel to each other, each slot including a pivoting axis formed substantially normal between the corresponding pair of side walls; a plurality of poles corresponding to the number of slots, each pole having an inner end

and an outer end, the inner ends of each pole connected to opposing side walls of each corresponding slot for pivotal movement about the pivoting axis; wherein in the open configuration the inner ends of each of the plurality of poles engages the at least one engaging surface of the base and is restricted from pivotal movement beyond said at least one engaging surface, and in the closed configuration the inner end of each of the plurality of poles are disengaged from the at least one engaging surface of the base such that each of the plurality of poles is pivotable to a position substantially perpendicular to each corresponding at least one engaging surface of the base.

[0015] In one embodiment, the hub assembly comprises a substantially circular first bottom support having a top surface and a bottom surface, the first bottom support having at least one opening positioned along an outer periphery of the first bottom support; a substantially cylindrical first inner wall extending upwardly from a radially inner section of the first bottom support, the first inner wall being formed integrally with the first bottom support; a first set of slots, each slot of the first set spaced apart circumferentially above the first bottom support and integrally formed therewith, each slot of the first set formed by a pair of opposing first side walls extending upwardly from the first bottom support top surface and radially outwardly from the first inner wall, each pair of first side walls substantially parallel to each other; a second set of slots, each slot of the second set positioned below the at least one opening of the first bottom support and integrally formed therewith, each slot of the second set formed by a pair of opposing second side walls extending downwardly from the first bottom support bottom surface and radially outwardly toward the outer periphery of the first bottom support, each pair of second side walls being substantially parallel to each other, each pair of second side walls connected by a second bottom support having a top surface and a bottom surface; a plurality of poles

- corresponding to the number of slots, each pole having an inner end and an outer end, each pole inner end pivotally connected to each pair of first and second side walls for pivotal movement about a pivoting axis normal to the side walls; wherein in the open configuration the inner end of each pole engages the top surface of each bottom support such that each pole is restricted from pivotal movement beyond said bottom supports, and in the closed configuration the inner end of each pole is disengaged from a corresponding bottom support such that each pole is pivotable to a position substantially perpendicular thereto.

[0016] In another embodiment, the hub assembly comprises a substantially circular bottom support; a substantially cylindrical inner wall extending upwardly from a radially inner section of the bottom support, the inner wall being formed integrally with the bottom support; a plurality of slots, each slot spaced apart circumferentially along the bottom support and integrally formed therewith, each slot formed by a pair of opposing side walls extending upwardly from the bottom support and radially outwardly from the inner wall, each pair of side walls substantially parallel to each other, top ends of each pair of side walls being connected by a top support having top and bottom surfaces, bottom ends of each pair of side walls being unconnected such that an opening is formed under each top support, opposing side walls of each pair having matching indentations to define a pivoting axis substantially normal between the opposing pair of walls; a plurality of poles corresponding to the number of slots, each pole having an inner end and an outer end, opposing sides of the inner ends of each pole each having a substantially cylindrical pin integrally extending therefrom, each opposing pin pivotally connected to the opposing indentations of each corresponding slot; wherein in the open configuration the inner end of each pole engages a bottom surface of the top support of a corresponding slot such that the pole inner end is restricted from pivotal movement beyond said top support, and in the closed configuration

the inner end of each pole is disengaged from the top support such that the poles are pivotable to a position substantially perpendicular to the top support.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] To better understand the present invention, a more particular description of the invention will be rendered by reference to the appended drawings.

[0018] Fig. 1 is a side perspective view of the instant tent of the present invention in an open configuration;

[0019] Fig. 1A is a partial perspective view of a top portion of the instant tent of Fig. 1, which is denoted “1A” in Fig. 1;

[0020] Fig. 2A is a side view of the instant tent shown in Fig. 1;

[0021] Fig. 2B is an alternate side view of the instant tent shown in Fig. 1;

[0022] Fig. 3 is a top view of the instant tent shown in Fig. 1;

[0023] Fig. 4 is a side view of the instant tent of an alternative embodiment of the present invention;

[0024] Fig. 5 is a top view of the instant tent shown in Fig. 4;

[0025] Fig. 6 is a partial perspective view of a hub assembly of a first embodiment of the present invention in the open configuration;

[0026] Fig. 7 is a partial perspective view of an alternative embodiment of a hub assembly of the present invention;

[0027] Fig. 8A is a bottom perspective view of a hub assembly of a second embodiment of the present invention;

[0028] Fig. 8B is a top perspective view of the hub assembly shown in Fig. 8A;

[0029] Fig. 8C is a top view of the hub assembly shown in Fig. 8A;

[0030] Fig. 8D is a sectional view of the hub assembly shown in Fig. 8A;

[0031] Fig. 9 is a perspective view of an alternative embodiment of a frame of the instant tent of the present invention;

[0032] Fig. 10 is a side perspective view of the frame shown in Fig. 9 in a partially closed or folded configuration;

[0033] Fig. 11A is a partial bottom perspective view of the frame shown in Fig. 9 in a closed or folded configuration; and

[0034] Fig. 11B is a side perspective view of the frame shown in Fig. 9 in a closed of folded configuration.

[0035] Fig. 12 is a top perspective view of a third embodiment of a hub assembly of the present invention;

[0036] Fig. 13 is a bottom side perspective view of the hub assembly of Fig. 12;

[0037] Fig. 14 is a top perspective view of a fourth embodiment of a hub assembly of the present invention without the poles;

[0038] Fig. 15 is a side view of an indentation of a slot of the hub assembly of Fig. 14;

[0039] Fig. 16 is a perspective view of an inner end of a pole of the hub assembly of Fig. 14;

[0040] Fig. 17 is a sectional view of the hub assembly of Fig. 14 with a pole attached thereto;

[0041] Fig. 18 is a perspective view of another embodiment of a tent of the present invention;

[0042] Fig. 19 is a top perspective view of a floor portion of the tent of Fig. 18;

[0043] Fig. 20 is a partial top perspective view of the tent of Fig. 18 in a partially collapsed configuration; and

[0044] Fig. 21 is a perspective view of a corner portion of the tent of Fig. 18.

- [0045] To facilitate an understanding of the invention, identical reference numerals and component descriptions have been used, when appropriate, to designate the same or similar elements that are common to the figures. Further, unless stated otherwise, the features shown in the figures are not drawn to scale, but are shown for illustrative purposes only.

DETAILED DESCRIPTION OF THE INVENTION

[0046] Referring to Fig. 1, a foldable tent 1 of the present invention is shown. The foldable tent is opened or erected to an open configuration as shown in Fig. 1, and folded or collapsed to a collapsed configuration as shown in Fig. 11B, without requiring assembly or disassembly of any parts.

[0047] Referring to Figs. 1, 6 and 8A-D, the foldable tent 1 is centrally supported by a hub 100, 200. In the preferred embodiment, the hub 100, 200 is circular but the shape of the hub 100, 200 can be modified to other shapes including but not limited to square, hexagon or octagon shapes. The hub 100, 200 is preferably formed of a tough, molded plastic but can also be constructed with other materials and methods without departing from the scope of the invention. The hub 100, 200 can also be molded such that it includes voids 121, as shown in Figs. 8A-D, to reduce the weight of the hub as well as manufacturing costs.

[0048] Referring to Fig. 6, in the first embodiment, the hub 100 comprises a stopper or base 12 having a top surface 12a and a bottom surface 12b. The base 12 includes a plurality of cabinets or slots 11 provided on the top surface of the base 12a and arranged in radial configuration. Each slot 11 is formed by a pair of adjacent walls 51, each having an inner end 51a and an outer end 51b, extending independently from the base top surface 12a. The inner surfaces of each wall 51 preferably include a curved groove 111 but the walls 51 can also function within the scope of the invention without the curved grooves 111. The walls of each slot 51 are also

provided with pivoting holes 41 located at a radially inner end of the walls 51a and are substantially aligned. In the first embodiment, the base 12 uniformly extends radially and provides a surface below each entire slot 11.

[0049] Referring to Figs. 8A-D, the connecting hub 200 of the second embodiment is shown. Here, the general structure of the hub 200 is similar to the hub of the first embodiment 100 with a few exceptions. First, the pivoting cabinets or slots 11 extend downward from the bottom surface of the base 12b. Second, the walls of each slot 51 have pivoting holes 41 located at a radially outer end of the walls 51b such that the holes 41 are substantially aligned. Third, the base portion 12 of each slot 11 is only partially extended radially outward such that an opening or void 61 extends radially outward through the rest of the slot 11 including below the pivoting holes of the walls 41. Fourth, a platform 51c having voids 121 extends radially outward between lower portions of adjacent slots 11 to provide additional strength to the slots 11.

[0050] Referring to Fig. 1, in the preferred embodiment, the tent 1 further comprises four flexible poles to form the frame of the tent, even though the tent 1 can operate with as few as three poles (see Fig. 7) and without limitation to the number of poles. While a variety of materials such as metal tubing, composite tubing (tubing made of resin impregnated fibers) or solid composite poles may be used, the flexible poles preferably each comprise segmented flexible poles formed from three fiberglass pole sections – a roof pole (or upper section) 2a, and a leg pole comprising a middle section 2b and a lower section 2c – that are connectable together. The pole sections 2a, 2b, 2c are preferably hollow to reduce the overall weight as well as manufacturing costs of the tent 1. The tent 1 can also be provided with any number of pole sections depending on the desired height of the tent in its open and collapsed configurations.

[0051] Referring to Fig. 1A, each roof pole 2a has first and second ends 71, 73, and forms a roof

portion of the tent 1. Referring to Fig. 6, in one embodiment, a substantially tubular pivoting cap 3, having first and second ends 3a, 3b, is secured to the first end of each roof pole 71. The caps 3 are constructed of a hard, molded plastic and provide the roof poles with additional protection from wear. The cap second end 3b is sufficiently secured onto the roof pole first end 71 by form-fit and/or adhesive but can also be secured via fastener 3d as shown in Figs. 8A-D. The cap 3 may also include a curved outer surface 31 to correspond to the curved grooves 111 of the walls 51 of each slot 11. Therefore, the external diameter of each pivoting cap 3 is slightly less than or equal to the distance between the inner surfaces of the walls 51 of each slot 11 to allow for each corresponding cap 3 to fit snugly into the slot 11 but also to allow the caps 3 to disengage from each slot 11 without excessive force. Referring to Figs. 8A-D, it is preferred that the caps 3 are constructed such that the surface of the caps 3 contacting the slot walls 51 as well as the slot walls 51 are substantially flat while maintaining a close fit. However, the caps 3 and slots 11 can be modified to other shapes and sizes to provide a close fit without departing from the spirit and scope of the present invention.

[0052] Referring to Figs. 6 and 8A-D, each cap 3 also has holes extending through opposing sides of the cap 3 such that the holes are substantially aligned. In the first embodiment, as shown in Fig. 6, the holes are located at the cap first end 3a. In each slot 11, a fastener or pivoting pin 4 extends through the holes of the cap 3 as well as the pivoting holes 41 located at the inner end of each wall 51a, thereby forming a pivoting axis for the roof poles 2a. In the second embodiment, the aligned holes are located at or near the cap second end 3b and a fastener 4 extends through each cap as well as the pivoting holes 41 located on the outer end of each wall 51b to form a pivoting axis. Alternatively, the roof poles 2a can be directly connected to the slots 11 without a pivoting cap as shown in Fig. 7. The pivoting pin 4 can be any type of

- fastener such as a rivet, rod, bolt or screw.

[0053] Referring again to Figs. 1, 6 and 8A-D, the instant tent also includes eave poles 2d, having first and second ends 75, 77 pivotally connected to the slots 11 in the same manner as the roof poles 2a as described above. In the one embodiment, as shown in Figs. 1, 3, 6, 8A-D, two eave poles 2d are included and each eave pole 2d is located on opposite sides of the base 12 between the roof poles 2a and extends radially outward at a length slightly shorter than the width of the tent 1. In an another embodiment, shown in Figs. 4-5, four eave poles 2d are included. Thus, one skilled in the art will recognize that the number, length and location of the eave poles can vary. Moreover, the eave poles could have one or more extensions that are slidably or pivotally coupled, for example, by a pivoting joint 21 as shown in Fig. 9, to accommodate rain flies of any size or shape.

[0054] One of ordinary skill in the art will also recognize that the pole sections 2a, 2b, 2c can also be coupled by other means, uniformly or in combination, including slidably, pivotably or by securing the pole sections 2a, 2b, 2c together by an elastic cord extending through the interior of the poles.

[0055] In the first embodiment, shown in Fig. 6, the base 12 uniformly extends radially and provides a surface 12a below the pivoting pins 4 and caps 3 so that the first ends of each roof pole and eave pole 71, 75 can pivot to and from the open and closed configurations within each corresponding slot 11. The base 12 is extended to cover the area under the caps 3 to relieve the stresses exerted on the roof poles 2a but one of ordinary skill in the art will recognize that the base 12 need not extend fully to provide a surface to cover the entire length of the caps 3.

[0056] Referring to Figs. 8A-D, in the second embodiment, the base 12 extends radially outward except that the base 12 does not extend above the radially outer portions of the slots 11 where

the caps 3 are pivotally connected to the walls 51, thereby forming an opening or a void 61. Thus, in the open configuration, as shown in Fig. 8D, the bottom surface of the base 12b restricts the caps 3 and first ends of each the roof pole and eave pole 71, 75 from any upward pivotal movement beyond the bottom surface of the base 12b. As a result, the roof pole and eave pole first ends 71, 75 are secured in a substantially horizontal position or substantially parallel to the bottom surface of the base 12b. Referring to Fig. 11A, in the closed configuration, the opening 61 provided on the radially outer portions of the slots 11 allow the pole second ends 73, 77 to pivotally move upward while all or a substantial portion of the caps 3 located at the pole first ends 71, 75 remain below a horizontal plane extending from the top surface of the base 12a in the closed configuration.

[0057] Referring to Figs. 1 and 9, the leg pole middle section 2b has a first end 101 and a second end 103. The roof pole 2a and the leg pole middle section 2b are pivotally coupled by a pivoting joint 21. In the preferred embodiment, the pivoting joint 21 is constructed as described in U.S. Patent No. 7,942,159, but the pivoting joint 21 can be constructed by any other conventional coupling means.

[0058] Referring again to Figs. 1 and 9, each leg pole lower section 2c includes first and second ends 122, 123. The inner diameter of the lower section 2c is substantially similar to the outer diameter of the middle section 2b such that the middle section 2b is telescopically slidable within the lower section 2c. The second end of the middle section 103 is provided with a locking member 25. Each telescoping lower section 2c includes a spring loaded detent pin for indexing in apertures provided in each corresponding middle section 2b for locking the leg pole 2b, 2c in an extended position as shown in Figs. 1 and 9, and depressing the detent pin to disengage the apertures to unlock and retract the leg pole lower section 2c as shown in Figs.

10 and 11B. It is preferred that the length of the lower section 2c is less than or equal to the length of the middle section 2b such that when retracted substantially all of the middle section 2b is stored within the lower section 2c. The length of the retracted leg pole 2b, 2c is less than the distance between the top surface of the base 12a and the second end of the roof pole 73 so that the retracted leg pole 2b, 2c could be folded and stored above the base 12 as shown in Fig. 11B. Each extendable lower section 2c also preferably includes a foot 53 for engagement with the ground or other floor surface.

[0059] One of ordinary skill in the art will recognize that multiple spring loaded detent pin-aperture combinations could be included in each leg pole 2b, 2c such that the leg poles 2b, 2c could be adjusted to different lengths. It will also be recognized that any other conventional means for connecting the leg poles 2b, 2c could be used, including but not limited to slidable and pivotal connections. It is also possible to couple multiple leg poles to a single roof pole, as described in China App. Pub. No. CN201474367U to provide additional surface area for the floor of the tent (described below) as well as to provide additional support to the frame.

[0060] Referring to Figs. 1-5, the tent 1 includes a tent canopy 55. In the preferred embodiment, the tent canopy 55 is water and flame resistant, and is a fabric constructed from materials such as cotton, polyester or nylon, or any combination thereof. The tent canopy 55 can also be constructed with heat reflecting material.

[0061] In the preferred embodiment, as shown in Figs. 1-5, the tent canopy 55 is an enclosure which includes four canopy walls and a floor. The tent canopy preferably includes windows 501 on three canopy walls with each window 501 having two overlapping layers. The outside layer of each window is constructed of a permeable fabric such as mesh or the like and is sewn into

the remaining fabric of the tent canopy 55. The permeable fabric allows outside air to enter the tent interior while also protecting the interior from bugs and debris. The inside layer is constructed of the water and flame resistant material described above, and is partially removable via a fastener such as a zipper or the like which is sewn into the remaining fabric of the tent canopy. The inside layer acts as a barrier between the interior of the tent and the outside such that when closed, the interior of the tent is protected from outside elements such as wind, rain or snow. Alternatively, the mesh outside layer of each window can be replaced with a transparent non-permeable material such as vinyl and the inside layer can be replaced with a shading device or curtain.

[0062] The fourth side of the tent canopy is also equipped with a double layer of fabric identical to that of the three windows except that the mesh outer layer as well as the canopy fabric inner layer are both partially removable via fasteners thereby providing the tent with a door 503 for entering and exiting the tent, as shown in Fig. 4. One ordinarily skilled in the art will recognize that the number of sides as well as the number of windows and doors could vary depending on preference and design without departing from the scope of the present invention.

[0063] Referring to Figs. 1-5, the top portion of the tent canopy 55 on each side of the tent 1 where the eave poles 2d are located also includes a permeable fabric 505 such as mesh. The permeable fabric improves ventilation for the tent interior while also protecting the interior from bugs and debris. In the preferred embodiment, the permeable section 505 is triangular and is located above the windows 501. One of ordinary skill in the art will recognize that a permeable fabric can be added to any number of sides of the tent and also take on other shapes and sizes without departing from the scope of the invention. For example, as shown in Figs. 4-5, a permeable section can be included on all sides of the tent canopy provided that additional eave

poles 2d and rain flies 507 (described in more detail below) are included on those sides.

[0064] As shown in Figs. 1-5, the canopy 55 is connected to each pole 2a, 2b, 2c proximate seams 509 which join the canopy walls. A sleeve 511 extends from each seam 509 and is connected to the roof pole 2a. Three separate hooks 513 also extend from each seam 509 and are movably connected to the first and second ends of the middle section 101, 103 and at the first end of the lower section 121. In the preferred embodiment, the sleeve 511, instead of hooks, is provided on the roof pole 2a not only for aesthetic purposes but also because the length of the roof pole 2a remains constant throughout the opening and collapsing of the tent 1 and therefore a movable connection, *i.e.*, a hook, is not required. The sleeve further provides the top portion of the canopy 55 with sufficient tension such that the top portion of the canopy does not sag. One with ordinary skill in the art will recognize that the various connecting methods as well as locations of the connections could vary without departing from the spirit and scope of the invention. An outer surface of the tent canopy at a top center location 55a can also be provided with a string 55b (see, *e.g.*, Fig. 2B) attached to a bottom portion of the hub 55c (see, *e.g.*, Figs. 8A-D) to provide additional stability to the tent 1 as well as to ensure that the tent canopy 55 does not sag.

[0065] Referring again to Figs. 1-5, the tent 1 also includes a rain fly 507 preferably constructed of the same material as the tent canopy 55 described above. The preferred embodiment includes two substantially triangular rain flies 507 on opposing sides of the tent 1. Each rain fly 507 has three perimeters 507a, 507b, 507c. Two of the three perimeters 507a, 507b are sewn into corresponding seams of the tent canopy 509 and culminate at the center of the tent canopy 55a. The remaining perimeter of each rain fly 507c is a free end which rests above the canopy wall. Each rain fly 507 is attached to a corresponding eave pole 2d along a line extending from the

center of the tent 55a to a midpoint of the remaining perimeter 507c and are attached to each eave pole 2d at the midpoint of the perimeter 507c to provide further support for the rain fly 507 and also to provide a decline on each side of the rain fly 507 to eliminate the possibility of water or debris accumulating on top of the rain fly 507. The hook 515 located at the second end of the eave pole 77 is permanently attached so that the rain fly 507 is taut when the tent is opened without the user having to make any adjustments.

[0066] The rain fly 507 also sufficiently covers the permeable upper portion of the tent canopy 505 and protects the permeable portion 505 and the interior of the tent 1 from rain or snow and also provides shading. Furthermore, because there is sufficient space between the rain fly 507 and permeable portion 505, air from the exterior of the tent 1 can enter and exit the tent interior uninhibitedly to provide continuous ventilation. Furthermore, the windows 501 located beneath the rain flies 507 are provided with overhead protection as well. One of ordinary skill in the art will recognize that the size, shape and number of the rain flies could vary. For example, as shown in Figs. 4-5, a rain fly can be added to all sides of the tent 1.

[0067] In operation, the collapsed tent 1 (see, *e.g.*, Fig. 11B) is erected by pulling the roof poles 2a, leg poles 2b, 2c and eave poles 2d radially outward from the hub 1 (see Fig. 10) and then unfolding and extending the leg poles 2b, 2c radially outward (see Fig. 9). Only the frame of the tent is illustrated in these drawings to clearly show the instant tent 1 in the closed and partially closed configurations.

[0068] In the first embodiment, the first ends of each roof pole and eave pole 71, 75 are secured within each corresponding slot 11 on the top surface of the base 12a and the curved outer surface 31 of the caps 3 and the curved grooves 111 of the slot walls 51 are engaged (see, *e.g.*, Fig. 6). Similarly, in the second embodiment, the first ends of each pole 71, 75 is secured within each

corresponding slot 11 as the caps of each roof pole and eave pole 3 engages the bottom surface of the base 12b and the slot walls 51 (see, *e.g.*, Figs. 8A-D).

[0069] Referring to Fig. 1, each roof pole second end 73 and leg pole middle portion first end 101 are aligned and engaged as described in U.S. Patent No. 7,942,159 or by any other conventional means. The leg pole lower section 2c is telescopically extended and locked to the middle section 2b via the locking member 25 by engaging the push pin with the aperture. The poles 2a, 2b, 2c are pulled radially outward to fully expand the tent canopy 55 and rain flies 507, the feet of the poles 53 are then fixed to the surface, and the tent 1 remains opened and securely erected. The tent 1 is further stabilized by downward forces exerted on the poles 2a, 2b, 2c by the tent canopy 55 through the various attachments (hooks 513 and sleeves 511) which tend to keep the poles 2a, 2b, 2c from pivoting upward.

[0070] To close the tent 1, the feet of the poles 53 are first disengaged from the supporting surface and the overall tension in the tent canopy 55 is decreased. Referring to Fig. 10, the lower sections of the poles 2c are telescopically retracted by disengaging the push pin and aperture of the locking mechanism 25. The roof pole 2a and leg pole middle portion 2b are pulled apart and each section is pivotally disengaged via the pivoting joint 21. The leg poles 2b, 2c and the tent canopy 55 are then folded radially inward toward the hub 100, 200. The poles are pivoted radially inward until the poles 2a-d (and canopy 55) are gathered above the hub 100, 200 in a compact closed configuration for convenient storage and transportability. In the first embodiment, the caps 3 are pivoted within the slots 11 above the top surface of the base 12a. In the second embodiment, the caps 3 are pivoted within the voids 61 of the base 12 such that the caps 3 remain within the voids 61 as shown in Fig. 11A and extend below the bottom surface of the base 12b.

[0071] Referring to Figs. 12 and 13, a third embodiment of a hub assembly 300 of the present invention is shown. The hub assembly 300 is similar to the hub assembly of the first embodiment 100 described above with a few differences. In this embodiment, the hub assembly 300 includes a substantially circular first bottom support or base 302 having a top surface 304 and a bottom surface 306. The first bottom support 302 includes openings 308 positioned along an outer periphery of the first bottom support 302. The hub assembly 300 is illustratively shown with two openings 308 but the number and locations of openings could vary without limitation. A substantially cylindrical first inner wall 310 extends upwardly from a radially inner section of the first bottom support 302 and is formed integrally with the first bottom support 302. In the present embodiment, the cylindrical first inner wall 310 forms a vertical void extending through the first bottom support 302. In this embodiment, an auxiliary support 330 extends diametrically through the void and is connected to an inner surface of the first inner wall 310 and is integrally formed therewith. The auxiliary support 330 is used to connect a canopy 332 of the tent with a string or strap 334 extending from the canopy 332, as shown in Fig. 13, to further secure the canopy 332 to the frame of the tent 1 and to prevent a center portion of the tent from sagging.

[0072] Referring again to Figs. 12 and 13, the first bottom support 302 includes a first set of slots. Each slot of the first set is spaced apart circumferentially above the first bottom support 302 and integrally formed therewith. Each slot of the first set is formed by a pair of opposing, substantially parallel first side walls 312 extending upwardly from the first bottom support top surface 304 and radially outwardly from the first inner wall 310. The hub assembly 300 also includes a second set of slots. Each slot of the second set is positioned below the openings 308, which are located between adjacent slots of the first set, and is integrally formed therewith. Each slot of the second set is formed by a pair of substantially parallel opposing second side

walls 314 extending downwardly from the first bottom support bottom surface 306 and radially outwardly to the outer periphery of the first bottom support 302. Each pair of second side walls 314 are connected by a second bottom support 316 having a top surface and a bottom surface. Radially inner ends of each pair of second side walls 314 are connected with a second inner wall 318 extending downwardly from the first bottom support bottom surface 306. Each second inner wall 318 is formed integrally with the first bottom support 302 and corresponding pair of second side walls 314. Thus, like each slot of the first set of slots, each slot of the second set is integrally formed by three sides to provide a solid foundation for housing each pole described below. The hub assembly 300 is illustratively shown with four equally spaced apart slots in the first set and two equally spaced apart slots in the second set, but the number and locations of the slots could vary. The positioning of the second set of slots below the first bottom support 302 instead of on the same plane as the first set of slots is critical to maintaining a smaller overall hub assembly. That is, due to the overall circular shape of hub assemblies, it is required that hub assemblies be manufactured with a larger surface area to accommodate for additional slots on the same plane. Thus, positioning the second set of slots below the first set of slots allows the hub assembly to remain compact while providing support for additional poles.

[0073] As shown in Figs. 12 and 13, the hub assembly 300 also includes a plurality of poles 320 corresponding to the number of slots. Each pole 300 includes an inner end and an outer end with each pole inner end pivotally connected to each pair of first and second side walls 312, 314 for pivotal movement about a pivoting axis normal to the side walls 312, 314. In this embodiment, the pivoting axis is formed by a fastener 322, such as a screw, rivet or the like, extending through each respective pair of side walls and pole. However, the pivoting axis could be formed by laterally extending pins from the poles engaging with indentations on opposing

side walls, as shown and described below with respect to a hub assembly of a fourth embodiment. Also, in this embodiment, each pole 320 inner end includes a cap 324 fixedly attached thereto, preferably by a fastener, such that the cap 324 is connected to the side walls 312, 314 to significantly decrease wear and tear on the pole 320 due to repeated pivotal movement of the poles 320. The portion of the cap 324 that forms the pivoting axis is preferably constructed of a solid, high-strength molded plastic and is capable of enduring the stresses associated with the use of the tent while in the open or pitched configuration. Other portions of the hub assembly 600 are constructed of the same material as well.

[0074] Referring to Fig. 13, in the present embodiment, the pivoting axes of the first set of slots are positioned radially inward relative to the pivoting axes of the second set of slots. This offset allows sufficient space above the bottom supports 302, 316 for folding and storing the poles 320 when the tent is in a closed or folded configuration. This is especially important for tents with many poles 320 as the tent in the closed or folded configuration must be sufficiently compact without having to force the components of the tent into the closed configuration as this may cause damage to the components.

[0075] In the open configuration, as shown for example in Figs. 12 and 13, the inner end of each pole 320 engages the top surface (not shown) of each bottom support 302, 316 such that each pole 320 is restricted from pivotal movement beyond the respective bottom supports 302, 316. In the closed configuration, the inner ends of each pole 320 are disengaged from a corresponding bottom support 302, 316 such that each pole 320 is pivotable to a position substantially perpendicular to the bottom support 302, 316 and such that the inner ends of each pole 320 are positioned directly above corresponding bottom supports 302, 316 within each respective slot.

[0076] A fourth embodiment of a hub assembly 400 of the present invention is shown in Figs.

14-17. Referring to Fig. 14, the hub assembly 400 is similar to the hub assembly of the second embodiment 200 described above but with a few differences. The hub assembly 400 includes a substantially circular bottom support 402 having a substantially cylindrical inner wall 404 extending upwardly from a radially inner section of the bottom support 402 and integrally formed therewith. In the present embodiment, an opening is formed in the radially inner section of the inner wall 404 and a diametrically extending auxiliary support 406 is integrally formed with the inner wall 404. The auxiliary support 406 is used to connect the tent canopy or rain fly with the hub assembly to prevent the upper center portion of the tent from sagging. Slots are integrally formed with the bottom support 402 and the inner wall 404. Each slot is spaced apart circumferentially along the bottom support 402 and each slot is formed by a pair of opposing side walls 410 extending upwardly from the bottom support 402 and radially outwardly from the inner wall 404. Each pair of side walls 410 is substantially parallel to each other and top ends of each pair of side walls 410 are connected by a top support 412 having top and bottom surfaces 414, 416, as shown in Fig. 17. Bottom ends of each pair of side walls 410 are unconnected such that an opening 420 is formed under each top support 412. In the present embodiment, each side wall 410 extends radially outwardly beyond a corresponding top support 412. Opposing side walls 410 of each pair also include matching indentations 430 to define a pivoting axis substantially normal between the opposing pair of walls 410.

[0077] Referring to Figs. 16 and 17, the hub assembly 400 includes a plurality of poles 440 corresponding to the number of slots. Each pole 440 includes an inner end and an outer end, and opposing sides of the inner ends of each pole each includes a substantially cylindrical pin 442 integrally extending therefrom. Each opposing pin 442 is pivotally connected to the opposing indentations 430 of each corresponding slot. In the present embodiment, each pole 440 inner

end includes a cap 444 fixedly attached thereto, preferably by a fastener, such that the cap 444 is connected to the side walls 410 to significantly decrease wear and tear on the pole 440 due to repeated pivotal movement of the poles 440. The pins 442 are integral the cap 440. The cap 440 is preferably constructed of a solid, high-strength molded plastic and is capable of enduring the stresses associated with the use of the tent, especially when the tent is in the open or pitched configuration. The hub portion of the hub assembly is also constructed of the same material to endure similar stresses exerted through the use of the tent.

[0078] Referring to Fig. 15, each indentation 430 is disposed on each side wall 410 substantially perpendicular to a corresponding top support 412 and extends the entire length of the side wall 410. Each indentation 430 also includes a ridge 432. An upper channel 434 is formed between the side wall upper end 436 and the ridge 432 with the width of the upper channel W_1 being greater than or equal to the diameter of each pin 442. A lower channel 435 is formed between the ridge 432 and a lower end of the side wall 438. The width of the lower channel W_3 is substantially similar to the diameter of each pin 442. The width of the indentation 430 at an apex of the ridge W_2 is slightly less than the diameter of each pin 442 such that during factory assembly each pin 442 is inserted through the upper channel 434, snap-fit past the apex of the ridge 432 and secured within the lower channel 435 for pivotal movement therein. The utilization of integral plastic pins 442 and indentations 430 instead of traditional metal fasteners drastically reduces the manufacturing cost by allowing faster assembly of the tent and lower material cost. This configuration also prevents possible damage to the tent fabric of the tent during assembly as well as use due to the tent fabric being tangled with the threads of the fastener and/or portions of the fastener protruding from the slots.

[0079] In the open configuration, the inner end of each pole 444 engages a bottom surface of the

top support 416 of a corresponding slot such that the pole inner end 444 is restricted from pivotal movement beyond the top support bottom surface 416, as shown in Fig. 17 (and Figs. 8A-8D). In the closed configuration, the inner end of each pole 444 is disengaged from the top support 412 such that the poles 440 are pivotable to a position substantially perpendicular to the top support 412, as shown for example in Fig. 11A.

[0080] Referring to Figs. 18-21, an embodiment of an adjustable loop 620 is illustratively shown. The present embodiment and other embodiments of an adjustable loop are described in China Patent No. CN 201152055Y. The adjustable loop is necessary to fold larger tents, in particular, tents having a large upper portion compared to the floor of the tent. This is because the ends of the poles are fixedly attached to the perimeter of the floor portion and, therefore, the floor portion of the tent must be large enough to accommodate the length of the poles when folding the tent. Otherwise, it is impossible to fold the poles into the intended compact configuration.

[0081] Referring to Fig. 18, a foldable tent 600 is illustratively shown. Similar to the foldable tent 1 shown in Fig. 1, the foldable tent 600 includes a central hub assembly 602 with a plurality of poles 604 pivotally connected thereto. Each pole 604 includes a roof pole 604a pivotally coupled to a leg pole having a middle section 604b and lower section 604c. In this embodiment, the leg pole middle section 604b is telescopically coupled to the leg pole lower section 604c as described above with respect to the tent 1 shown in Fig. 1. Also, a tent canopy or tent fabric 606 is attached to the tent poles 604 at various locations and via various means as described above with respect to the tent 1 shown in Fig. 1. The tent canopy 606 is attached to a tub floor 608 via conventional sewing methods to form an integral enclosure when the tent 600 is opened or pitched as shown in Fig. 18. The floor 608 is constructed of a tough, water resistant

polyethylene material. In the present embodiment, an engaging surface of the floor 608 includes a substantially square shaped periphery with four sides 608a-608d and having a diagonal length A, as illustratively shown in Fig. 19. In this embodiment, a pair of opposing poles 604 are substantially aligned with the diagonal length of the floor 608.

[0082] Referring to Fig. 21, each pole end is fixedly coupled to a coupling extension 610 for further securing the poles 604 to the canopy 606. The coupling extension 610 is formed of a tough, molded plastic and includes a pole receiving portion 612 for securing the pole 604. The coupling extension 610 also includes a stake hole 614 to accommodate for a stake (not shown) to secure the tent 600 to a surface. The stake hole 614 could be integrally formed with the coupling extension 610 as shown in Fig. 21 or separately attached to the coupling extension 610 as shown in Fig. 20. The coupling extension 610 also includes a loop hole 616 extending proximately along an inner edge of the coupling extension 610. The loop hole 616 receives the adjustable loop 620 having a constant length to form a first section 622 fixed to the canopy 606 by conventional sewing methods and a second section 624 fixed to the floor 608 also by conventional sewing methods, such that each of the first and second sections 622, 624 are adjustable through the loop hole 616. Each section 622, 624 could also be heat welded onto the respective surfaces with additional protective fabric to provide an even more secure attachment and to prevent water leakage through stitch lines. In the present embodiment, the extendable loops 620 are constructed of a woven polyester webbing and coated with vinyl (PVC) to provide a strong but flexible, waterproof coating. The overall length of the extendable loop 620 and location of attachment location on the canopy 606 could vary depending on the discrepancy in the diagonal lengths of the poles 604 and floor 608. However, it is preferred that the extendable loop 620 is sufficiently taut when the tent 600 is in the opened or pitched configuration as shown

in Fig. 18 and 21.

[0083] Referring to Fig. 20, the foldable tent is folded by retracting the leg pole middle section 604b within the leg pole lower section 604c to a length F and folding the retracted leg pole 604b, 604c upwardly toward the roof pole 604a having a length E. During the folding process, the hub assembly 602 is lowered to the surface as the canopy 606 is collapsed and flattened above the surface. Because the diagonal length A of the floor 608 (Fig. 19) is less than the combined length of two aligned folded poles 604 (or half of the diagonal length of the floor ($A/2$) is less than the length of a folded pole 604 ($E+F$)), the configuration of the extendable loop 620 is shifted such that the first section 622 is retracted as the second section 624 is lengthened, each by the same amount. Thus, the lack of slack of the floor 608 is compensated by the excess slack of the canopy 606 such that the combined length of each folded pole 604 ($E+F$) is less than the combined length of half the diagonal length of the floor ($A/2$); a length between distal ends of each section 622, 624 (B); and a length between the distal end of the first section 622 and end of the pole 604 (D); or $E+F < A/2+B+D$. This allows for the poles 604 to be folded collectively with the canopy and floor 606, 608 into a compact state as shown for example in Fig. 11B.

CLAIMS

1. An instant tent convertible between open and closed configurations, said tent comprising:
 - a central hub having a base, the base having an engaging surface,
 - first and second sets of slots formed on the engaging surface of the base, each slot formed by first and second slot walls and the engaging surface of the base, each of the first and second slot walls extending independently from the engaging surface of the base and substantially parallel to each other,
 - the first set of slots comprising at least three slots spaced apart radially,
 - the second set of slots comprising at least one slot disposed between adjacent slots of the first set,
 - at least one eave pole corresponding to the number of slots of the second set of slots, each eave pole having first and second ends, each eave pole first end pivotally coupled to a corresponding slot of the second set,
 - a plurality of roof poles corresponding to the number of slots of the first set of slots, each roof pole having a first and second end, each roof pole first end pivotally coupled to a corresponding slot of the first set,
 - a plurality of leg poles corresponding to the number of roof poles, each leg pole having a middle section and a lower section, each middle and lower section having a first end and a second end,
 - wherein each roof pole second end is coupled to a corresponding middle section first end, and said middle section second end is coupled to a corresponding lower section first end,
 - a canopy comprising a plurality of adjoining canopy walls and a floor coupled together at seams to form an enclosure, each canopy wall having a top, bottom and two side portions, at

- least one of the canopy walls having a vent, wherein the canopy is continuously connected to the roof poles and leg poles in the open and closed configurations, and

at least one rain fly disposed proximate the vent, the at least one rain fly having a plurality of perimeters, wherein the at least one rain fly is continuously connected to the canopy and corresponding at least one eave pole in the open and closed configurations.

2. The instant tent in claim 1, wherein two adjacent perimeters of the at least one rain fly are each coupled to corresponding seams of the canopy wall having the vent.

3. The instant tent in claim 2, wherein the at least one eave pole is coupled to the at least one rain fly between the two adjacent perimeters.

4. The instant tent in claim 3, wherein the at least one rain fly is substantially triangular in shape having three perimeters.

5. The instant tent in claim 1, wherein the slots of each first set of slots are uniformly spaced apart.

6. The instant tent in claim 1, wherein each of the at least one eave pole comprises at least two coupled sections.

7. The instant tent in claim 1, wherein the base comprises at least one void.

8. A hub assembly for an instant tent convertible between open and closed configurations, said hub assembly comprising:

a base having first and second surfaces,

first and second sets of slots, the first set of slots comprising at least three slots spaced apart radially, the second set of slots comprising at least one slot disposed between adjacent slots of the first set,

each slot formed by first and second slot walls, each of the first and second slot walls

extending independently from the first surface of the base and substantially parallel to each other, each slot wall having an inner and outer end,

a plurality of roof poles corresponding to the number of slots of the first set of slots, each roof pole having a first and second end, each roof pole first end pivotally coupled to first and second slot walls of a corresponding slot of the first set,

at least one eave pole corresponding to the number of slots of the second set of slots, each eave pole having first and second ends, each eave pole first end pivotally coupled to first and second slot walls of a corresponding slot of the second set,

wherein in the open configuration the first ends of each roof pole and eave pole engage the first surface of the base, and in the closed configuration said first ends are disengaged from the first surface of the base and pivoted substantially perpendicular to the base.

9. The hub assembly in claim 8, wherein the first ends of each roof pole and eave pole are pivotally coupled to first and second walls of each slot proximate the inner end of each slot wall.

10. The hub assembly in claim 9, wherein the base extends within each slot to the outer ends of each slot wall.

11. A hub assembly for an instant tent convertible between open and closed configurations, said hub assembly comprising:

a base having first and second surfaces,

first and second sets of slots, the first set of slots comprising at least three slots spaced apart radially, the second set of slots comprising at least one slot disposed between adjacent slots of the first set,

each slot formed by first and second slot walls, each of the first and second slot walls extending independently from the second surface of the base and substantially parallel to each

other, each slot wall having an inner and outer end,

a plurality of roof poles corresponding to the number of slots of the first set of slots, each roof pole having a first and second end, each roof pole first end pivotally coupled to first and second slot walls of a corresponding slot of the first set,

at least one eave pole corresponding to the number of slots of the second set of slots, each eave pole having first and second ends, each eave pole first end pivotally coupled to first and second slot walls of a corresponding slot of the second set,

wherein in the open configuration the first ends of each roof pole and eave pole engage the second surface of the base, and in the closed configuration the first ends of each roof pole and eave pole are disengaged from the second surface of the base and pivoted substantially perpendicular to the base.

12. The hub assembly in claim 11, wherein the first ends of each roof pole and eave pole are pivotally coupled to first and second walls of each corresponding slot proximate the outer ends of each first and second slot walls.

13. The hub assembly in claim 12, wherein the base extends to a position between the inner end and outer end of each slot wall forming an opening at a radially outer portion of each slot.

14. The hub assembly in claim 13, wherein the first ends of each roof pole and eave pole are pivotable within the opening of each slot.

15. A hub assembly for opening and closing a tent between an open configuration and a closed configuration comprising:

a substantially circular first bottom support having a top surface and a bottom surface, the first bottom support having at least one opening positioned along an outer periphery of the first bottom support;

a substantially cylindrical first inner wall extending upwardly from a radially inner section of the first bottom support, the first inner wall being formed integrally with the first bottom support;

a first set of slots, each slot of the first set spaced apart circumferentially above the first bottom support and integrally formed therewith, each slot of the first set formed by a pair of opposing first side walls extending upwardly from the first bottom support top surface and radially outwardly from the first inner wall, each pair of first side walls substantially parallel to each other;

a second set of slots, each slot of the second set positioned below the at least one opening of the first bottom support and integrally formed therewith, each slot of the second set formed by a pair of opposing second side walls extending downwardly from the first bottom support bottom surface and radially outwardly toward the outer periphery of the first bottom support, each pair of second side walls being substantially parallel to each other, each pair of second side walls connected by a second bottom support having a top surface and a bottom surface;

a plurality of poles corresponding to the number of slots, each pole having an inner end and an outer end, each pole inner end pivotally connected to each pair of first and second side walls for pivotal movement about a pivoting axis normal to the side walls;

wherein in the open configuration the inner end of each pole engages the top surface of each bottom support such that each pole is restricted from pivotal movement beyond said bottom supports, and in the closed configuration the inner end of each pole is disengaged from a corresponding bottom support such that each pole is pivotable to a position substantially perpendicular thereto.

16. The hub assembly of claim 15, wherein radially inner ends of each pair of second side

walls are connected with a second inner wall extending downwardly from the first bottom support bottom surface, each second inner wall formed integrally with the first bottom support and corresponding pair of second side walls.

17. The hub assembly of claim 15, further comprising a vertical void extending through the first bottom support, the void bordered by the first inner wall.

18. The hub assembly of claim 17, further comprising an auxiliary support extending diametrically through the void and connected to an inner surface of the first inner wall, the auxiliary support being integrally formed with the first inner wall.

19. The hub assembly of claim 15, wherein in the closed configuration each pole inner end is pivotable to a position directly above each corresponding bottom support.

20. The hub assembly of claim 15, wherein the pivoting axes of the first set of slots are positioned radially inward relative to the pivoting axes of the second set of slots.

21. A hub assembly for opening and closing a tent between an open configuration and a closed configuration comprising:

a substantially circular bottom support;

a substantially cylindrical inner wall extending upwardly from a radially inner section of the bottom support, the inner wall being formed integrally with the bottom support;

a plurality of slots, each slot spaced apart circumferentially along the bottom support and integrally formed therewith, each slot formed by a pair of opposing side walls extending upwardly from the bottom support and radially outwardly from the inner wall, each pair of side walls substantially parallel to each other, top ends of each pair of side walls being connected by a top support having top and bottom surfaces, bottom ends of each pair of side walls being unconnected such that an opening is formed under each top support, opposing side walls of each

pair having matching indentations to define a pivoting axis substantially normal between the opposing pair of walls;

a plurality of poles corresponding to the number of slots, each pole having an inner end and an outer end, opposing sides of the inner ends of each pole each having a substantially cylindrical pin integrally extending therefrom, each opposing pin pivotally connected to the opposing indentations of each corresponding slot;

wherein in the open configuration the inner end of each pole engages a bottom surface of the top support of a corresponding slot such that the pole inner end is restricted from pivotal movement beyond said top support, and in the closed configuration the inner end of each pole is disengaged from the top support such that the poles are pivotable to a position substantially perpendicular to the top support.

22. The hub assembly of claim 21, wherein each side wall extends radially outwardly beyond a corresponding top support.

23. The hub assembly of claim 21, wherein each indentation is disposed on each side wall substantially perpendicular to a corresponding top support, each indentation extending downwardly from an upper end of each side wall.

24. The hub assembly of claim 21, wherein each indentation comprises a ridge, each indentation having:

an upper channel between the side wall upper end and the ridge, the width of the upper channel being greater than or equal to the diameter of each pin;

a lower channel between the ridge and a lower end of the side wall, the width of the lower channel being substantially similar to the diameter of each pin; and

a space defining the width of the indentation at an apex of the ridge, the space being

slightly less than the diameter of each pin such that each pole is inserted through the upper channel, snap-fit past the apex of the ridge and secured within the lower channel.

25. The hub assembly of claim 21, further comprising an auxiliary support diametrically connected to an inner surface of the inner wall, the auxiliary support being integrally formed with the inner wall.

26. A hub assembly for opening and closing a tent between an open configuration and a closed configuration comprising:

a base having at least one planar engaging surface;

a plurality of slots formed on the base, each slot formed by a pair of side walls extending substantially normal from the plane of the engaging surface and integrally formed on the base, the side walls of each pair being substantially parallel to each other, each slot including a pivoting axis formed substantially normal between the corresponding pair of side walls;

a plurality of poles corresponding to the number of slots, each pole having an inner end and an outer end, the inner ends of each pole connected to opposing side walls of each corresponding slot for pivotal movement about the pivoting axis;

wherein in the open configuration the inner ends of each of the plurality of poles engages the at least one engaging surface of the base and is restricted from pivotal movement beyond said at least one engaging surface, and in the closed configuration the inner end of each of the plurality of poles are disengaged from the at least one engaging surface of the base such that each of the plurality of poles is pivotable to a position substantially perpendicular to each corresponding at least one engaging surface of the base.

27. The hub assembly of claim 26, wherein the plurality of slots includes a first set of slots, each slot of the first set spaced apart circumferentially on a top surface of the base, the top

surface of the base defining one of the at least one planar engaging surfaces.

28. The hub assembly of claim 27, wherein the plurality of slots includes a second set of slots, each slot of the second set spaced apart circumferentially on a bottom surface of the base, the bottom surface of the base defining another one of the at least one planar engaging surfaces.

29. The hub assembly of claim 28, wherein the pivoting axes of the first set of slots are positioned radially inward relative to the pivoting axes of the second set of slots.

30. The hub assembly of claim 26, wherein each opposing side wall of each pair comprises matching indentations to define a pivoting axis substantially normal between the opposing side walls.

31. The hub assembly of claim 30, wherein each indentation is disposed on each side wall substantially perpendicular to the base.

32. The hub assembly of claim 30, wherein opposing sides of the inner ends of each of the plurality of poles comprises a substantially cylindrical pin integrally extending therefrom, each opposing pin pivotally connected to the opposing indentations of each slot.

33. The hub assembly of claim 32, wherein each indentation is disposed on each side wall substantially perpendicular to the base, each indentation extending downwardly from an upper end of each side wall.

34. The hub assembly of claim 33, wherein each indentation comprises a ridge, each indentation having:

an upper channel between the side wall upper end and the ridge, the width of the upper channel being greater than or equal to the diameter of each pin;

a lower channel between the ridge and a lower end of the side wall, the width of the lower channel being substantially similar to the diameter of each pin; and

a space defining the width of the indentation at an apex of the ridge, the space being slightly less than the diameter of each pin such that each pole is inserted through the upper channel, snap-fit past the apex of the ridge and secured within the lower channel.

35. A hub assembly for opening and closing a tent between an open configuration and a closed configuration comprising:

a substantially circular bottom support;

a substantially cylindrical inner wall extending upwardly from a radially inner section of the bottom support, the inner wall being formed integrally with the bottom support;

a plurality of slots, each slot spaced apart circumferentially along the bottom support and integrally formed therewith, each slot formed by a pair of opposing side walls extending upwardly from the bottom support and radially outwardly from the inner wall, each pair of side walls substantially parallel to each other, top ends of each pair of side walls being connected by a top support having top and bottom surfaces, bottom ends of each pair of side walls below the top support being unconnected such that an opening is formed under each top support;

a plurality of poles corresponding to the number of slots, each pole having an inner end and an outer end, each pole inner end pivotally coupled to a corresponding slot;

wherein in the open configuration the inner end of each pole engages a bottom surface of the top support of a corresponding slot such that the pole inner end is restricted from pivotal movement beyond said top support, and in the closed configuration the inner end of each pole is disengaged from the top support such that the poles are pivotable to a position substantially perpendicular to the top support.

36. The hub assembly of claim 35, wherein each side wall extends radially outwardly beyond a corresponding top support.

37. The hub assembly of claim 35, wherein opposing side walls of each slot includes matching indentations and opposing sides of the inner ends of each pole includes a pivot extension extending therefrom, each opposing pivot extension coupled to the opposing indentations of each corresponding slot to define a pivoting axis.

38. The hub assembly of claim 37, wherein each indentation is disposed on each side wall substantially perpendicular to a corresponding top support, each indentation extending downwardly from an upper end of each side wall.

39. The hub assembly of claim 37, wherein each indentation comprises:

a ridge;

an upper channel between the side wall upper end and the ridge, the width of the upper channel being greater than the diameter of each pivot extension;

a lower channel between the ridge and a lower end of the side wall, the width of the lower channel being substantially similar to the diameter of each pivot extension; and

a space defining the width of the indentation at an apex of the ridge, the space being slightly less than the diameter of each pivot extension such that each pivot extension is inserted through the upper channel and the apex of the ridge and secured within the lower channel.

40. The hub assembly of claim 35, further comprising an auxiliary support diametrically connected to an inner surface of the inner wall, the auxiliary support being integrally formed with the inner wall.

41. A hub assembly for opening and closing a tent between an open configuration and a closed configuration, the hub assembly comprising:

a bottom support;

a plurality of slots, each slot spaced apart circumferentially along the bottom support and integrally formed therewith, each slot formed by a pair of opposing side walls extending upwardly from the bottom support, top ends of each pair of side walls being connected by a top support having top and bottom surfaces, bottom ends of each pair of side walls being unconnected to each other such that an opening is formed under each top support;

a plurality of poles corresponding to the number of slots, each pole having an inner end and an outer end, each pole inner end pivotally connected to opposing side walls of a corresponding slot;

wherein in the open configuration the inner end of each pole engages a bottom surface of the top support of a corresponding slot such that the pole inner end is restricted from pivotal movement beyond said top support, and in the closed configuration the inner end of each pole is disengaged from the top support such that the poles are pivotable to a position substantially perpendicular to the top support.

42. The hub assembly of claim 41, wherein the opposing side walls of each slot comprise indentations and opposing sides of each pole inner end comprises a pivot extension, the pivot extensions being secured within corresponding indentations to define a pivoting axis.

43. The hub assembly of claim 42, wherein each indentation is disposed on each side wall substantially perpendicular to a corresponding top support.

44. The hub assembly of claim 42, wherein each indentation extends downwardly from an upper end of each side wall.

45. The hub assembly of claim 44, wherein each indentation comprises:

a ridge;

an upper channel between the side wall upper end and the ridge, the width of the upper channel being greater than the diameter of a corresponding pivot extension;

a lower channel between the ridge and a lower end of the side wall, the width of the lower channel being substantially similar to the diameter of each pin; and

a space defining the width of the indentation at an apex of the ridge, the space being slightly less than the diameter of each pivot extension such that each pivot extension is inserted through the upper channel and the ridge and secured within the lower channel.

46. The hub assembly of claim 41, wherein each pair of side walls are substantially parallel to each other.

47. The hub assembly of claim 41, wherein each pair of side walls extends radially outwardly beyond a corresponding top support.

48. A hub assembly for a tent comprising:

a plurality of circumferentially spaced apart slots, each slot formed by a pair of opposing side walls, distal ends of said side walls having an engaging surface extending therebetween, opposing proximal ends of said side walls being unconnected to each other such that an opening is formed opposite the engaging surface, said opposing side walls having indentations substantially aligned with each other, each indentation positioned radially outside a radially outer free end of the engaging surface; and

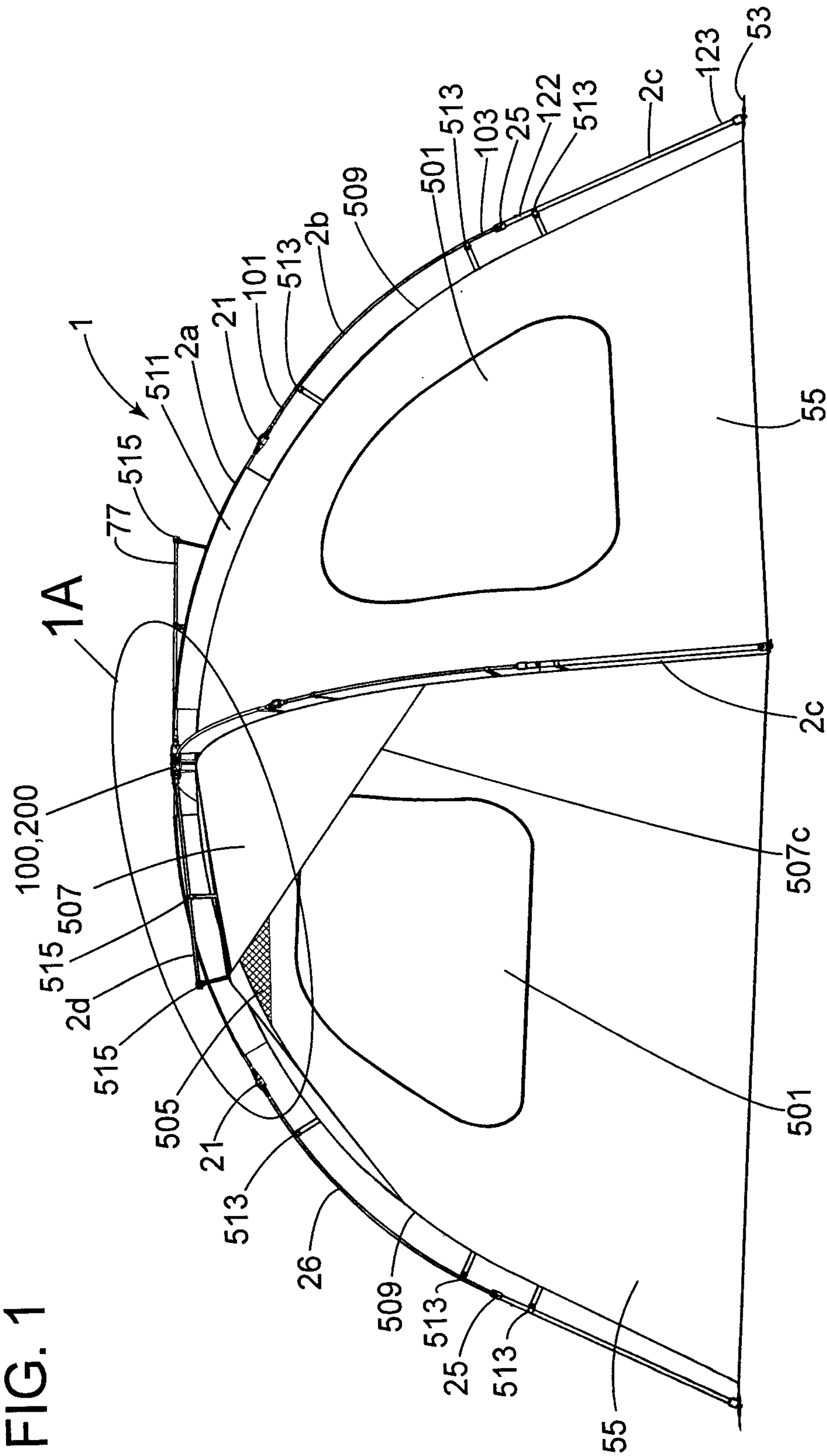
a plurality of poles, each pole having an inner end and an outer end, each pole inner end coupled to a corresponding slot, each pole inner end having a pivot extension extending therefrom;

wherein each pivot extension is secured to corresponding indentations such that each pole is pivotable from an open configuration wherein said pole inner end engages the engaging surface and a folded configuration wherein said pole is disengaged from the engaging surface and positioned substantially perpendicular thereto.

49. The hub assembly of claim 48, wherein each of said indentations comprises a first channel, a second channel and a ridge therebetween.

50. The hub assembly of claim 49, wherein the width of the first channel is greater than the width of a corresponding pivot extension, a space defining the width of the indentation at an apex of the ridge is less than the thickness of each pivot extension and the width of the second channel is substantially similar to the width of each pivot extension.

51. The hub assembly of claim 49, wherein each second channel is substantially circular.
52. The hub assembly of claim 48, wherein each indentation extends from an upper end of the side wall to a mid portion of the side wall.
53. The hub assembly of claim 48, wherein the pivot extensions are substantially cylindrical.
54. The hub assembly of claim 48, wherein the engaging surface is positioned at upper ends of the side walls.



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FIG. 1A

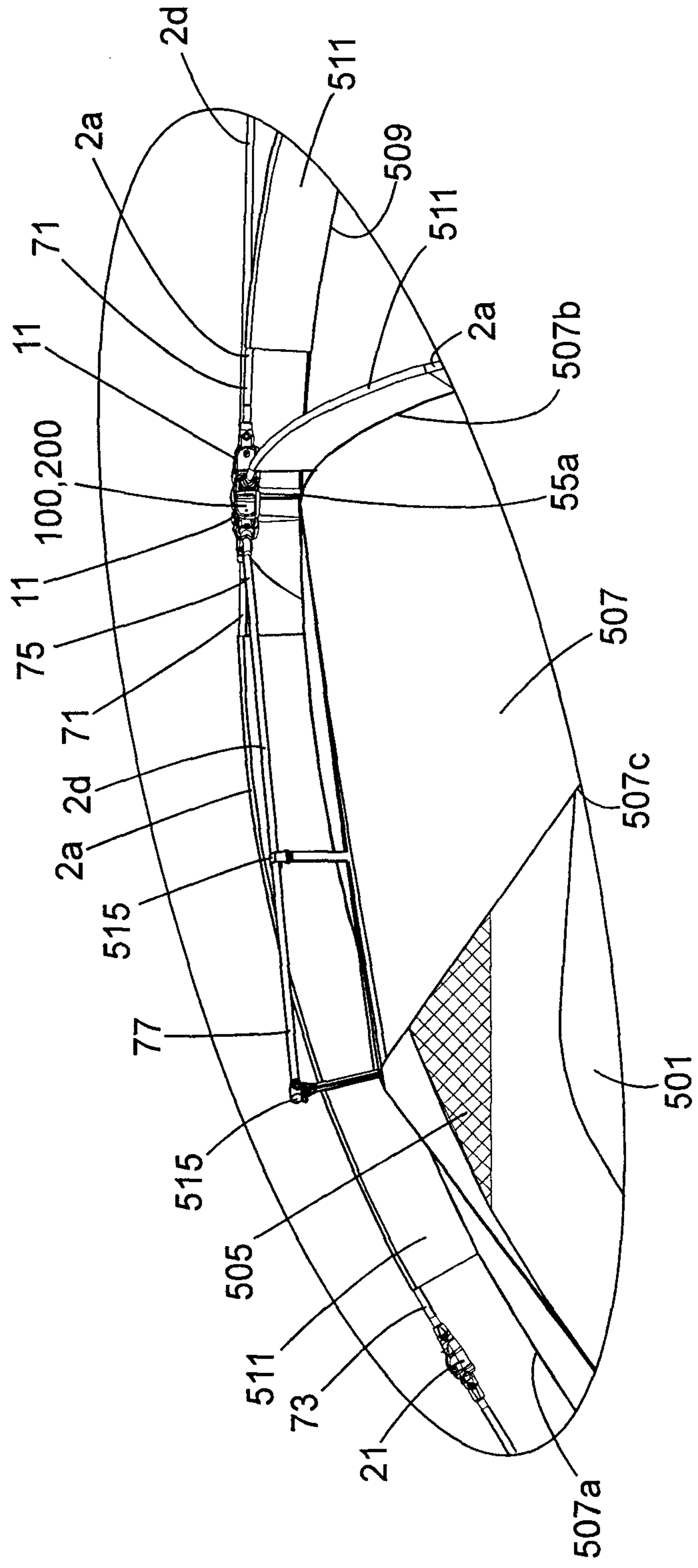


FIG. 2A

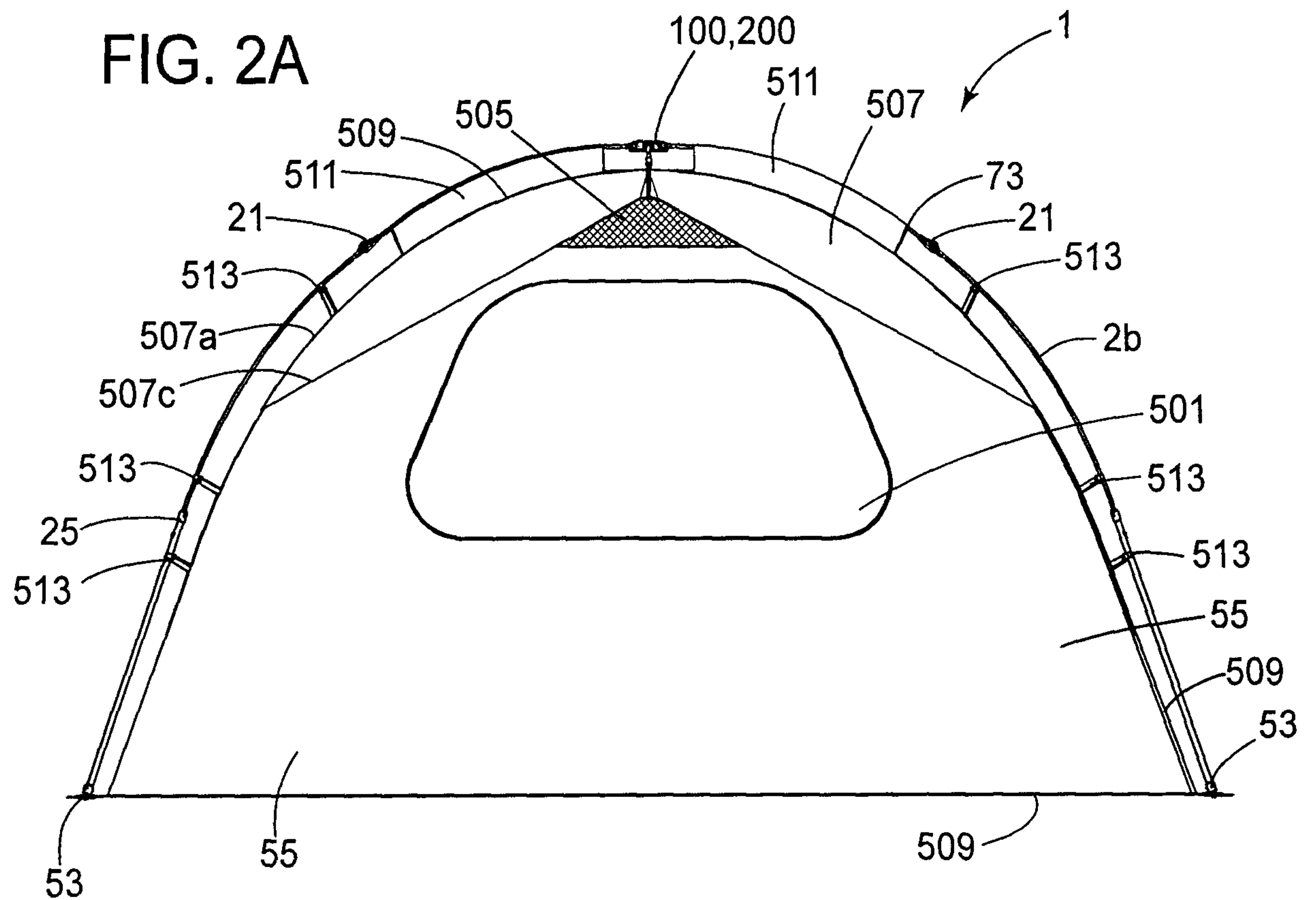
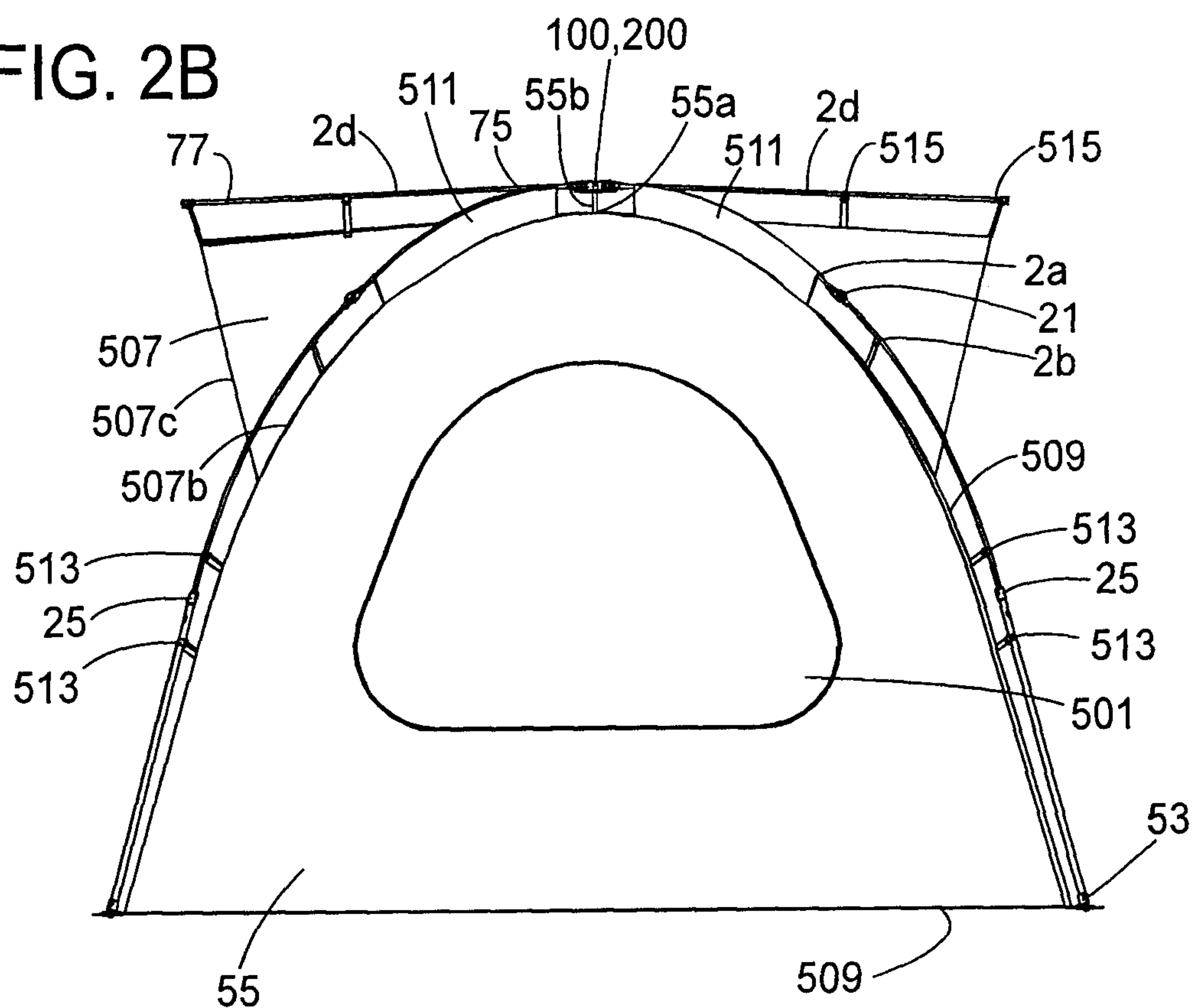


FIG. 2B



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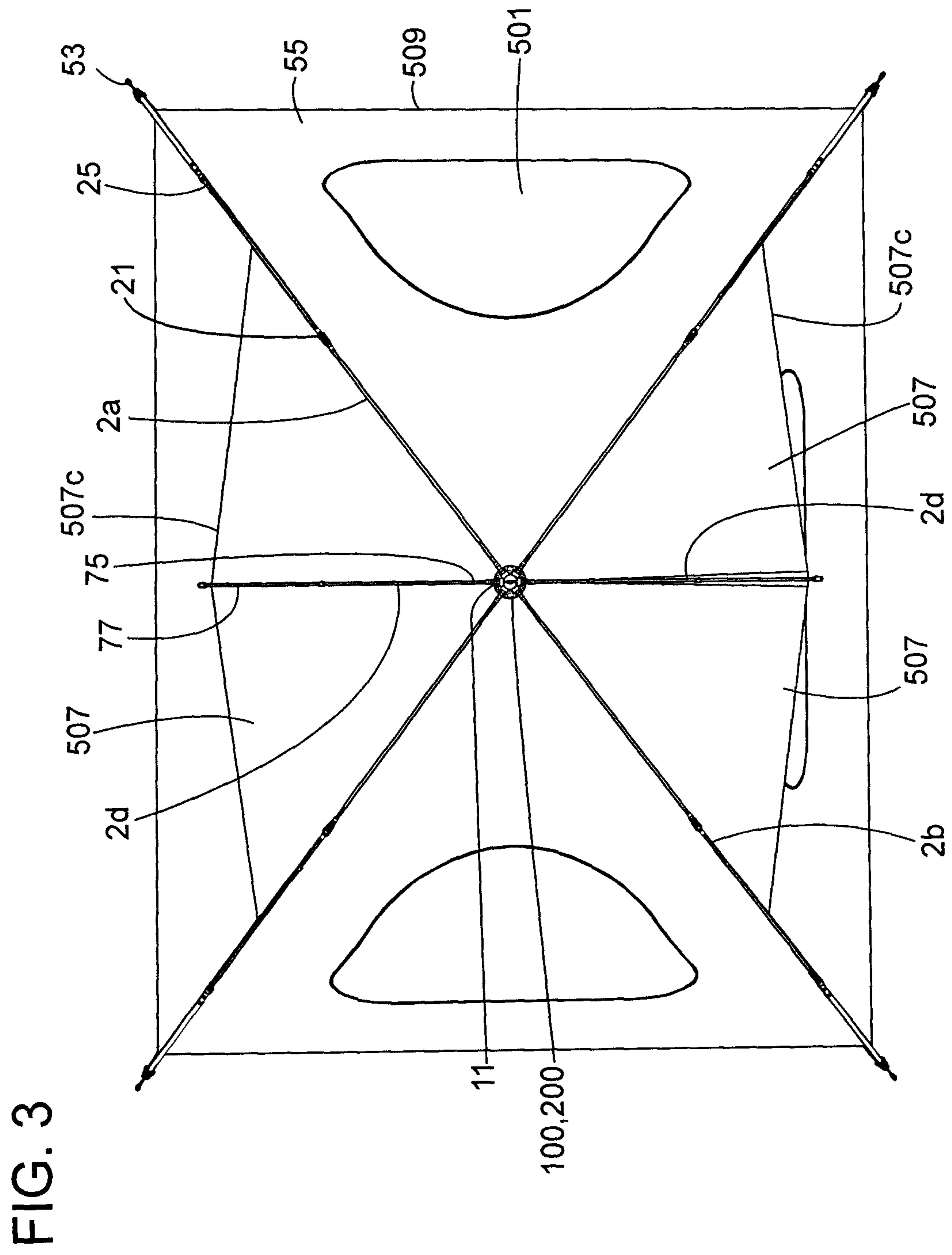


FIG. 4

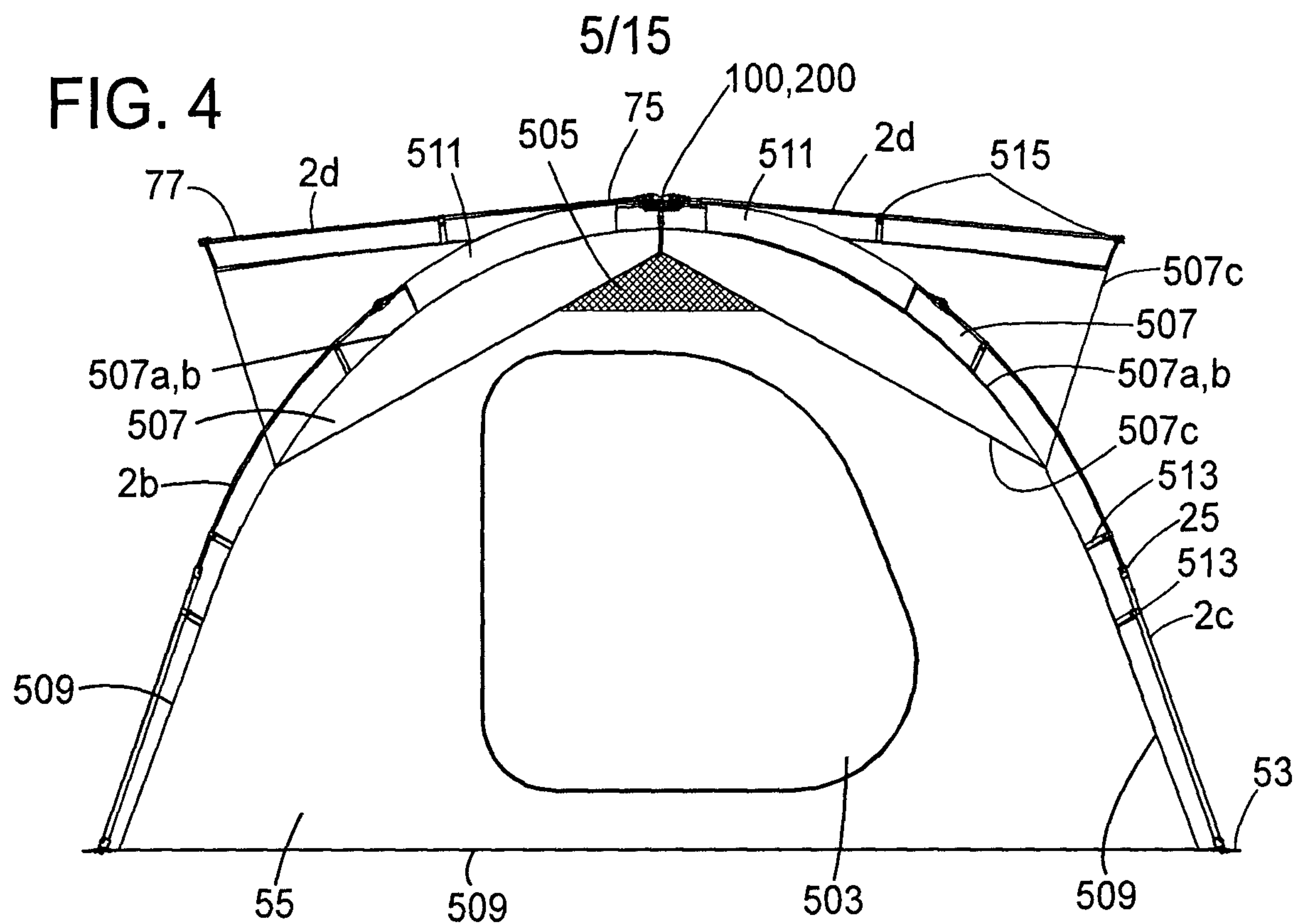
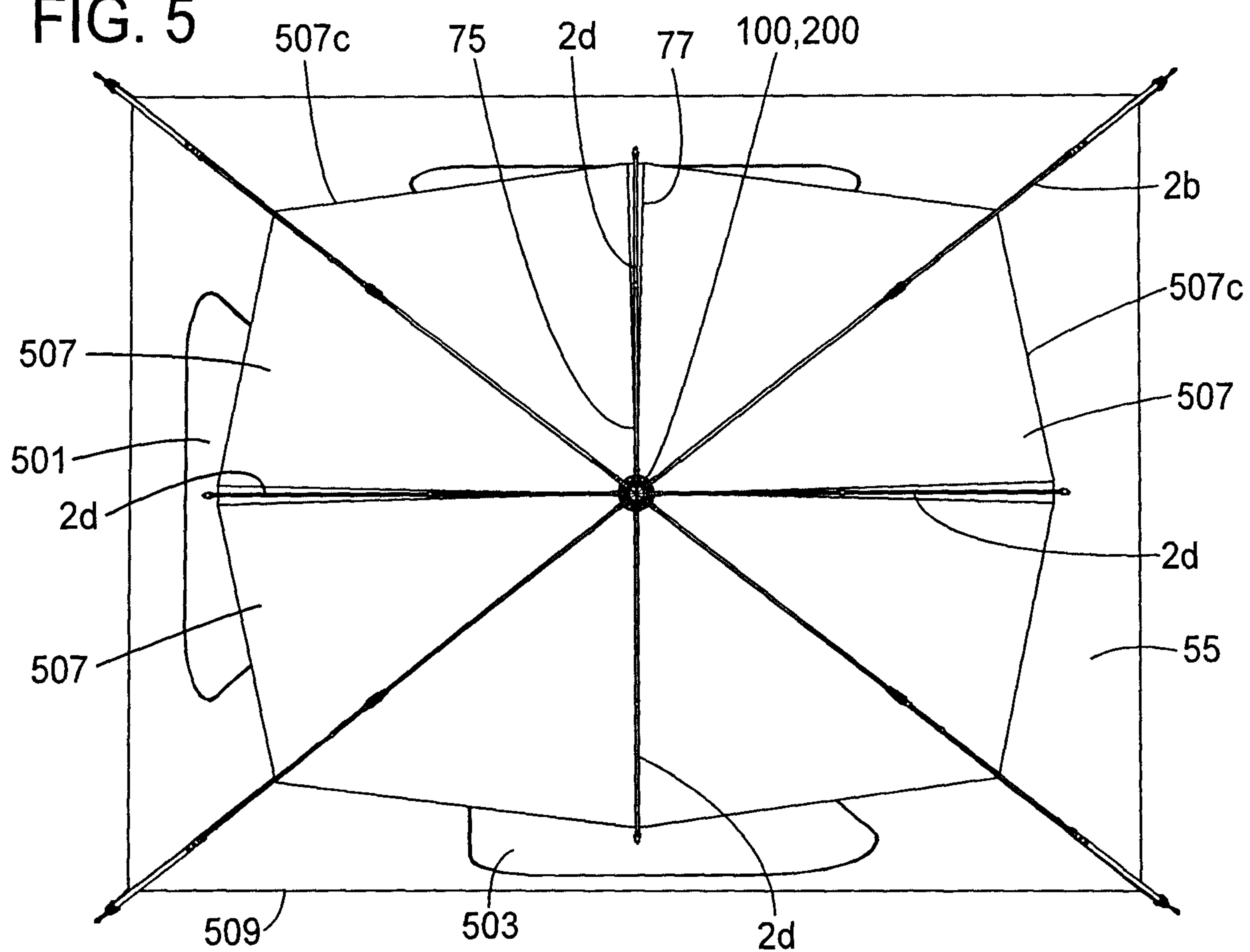


FIG. 5



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FIG. 6

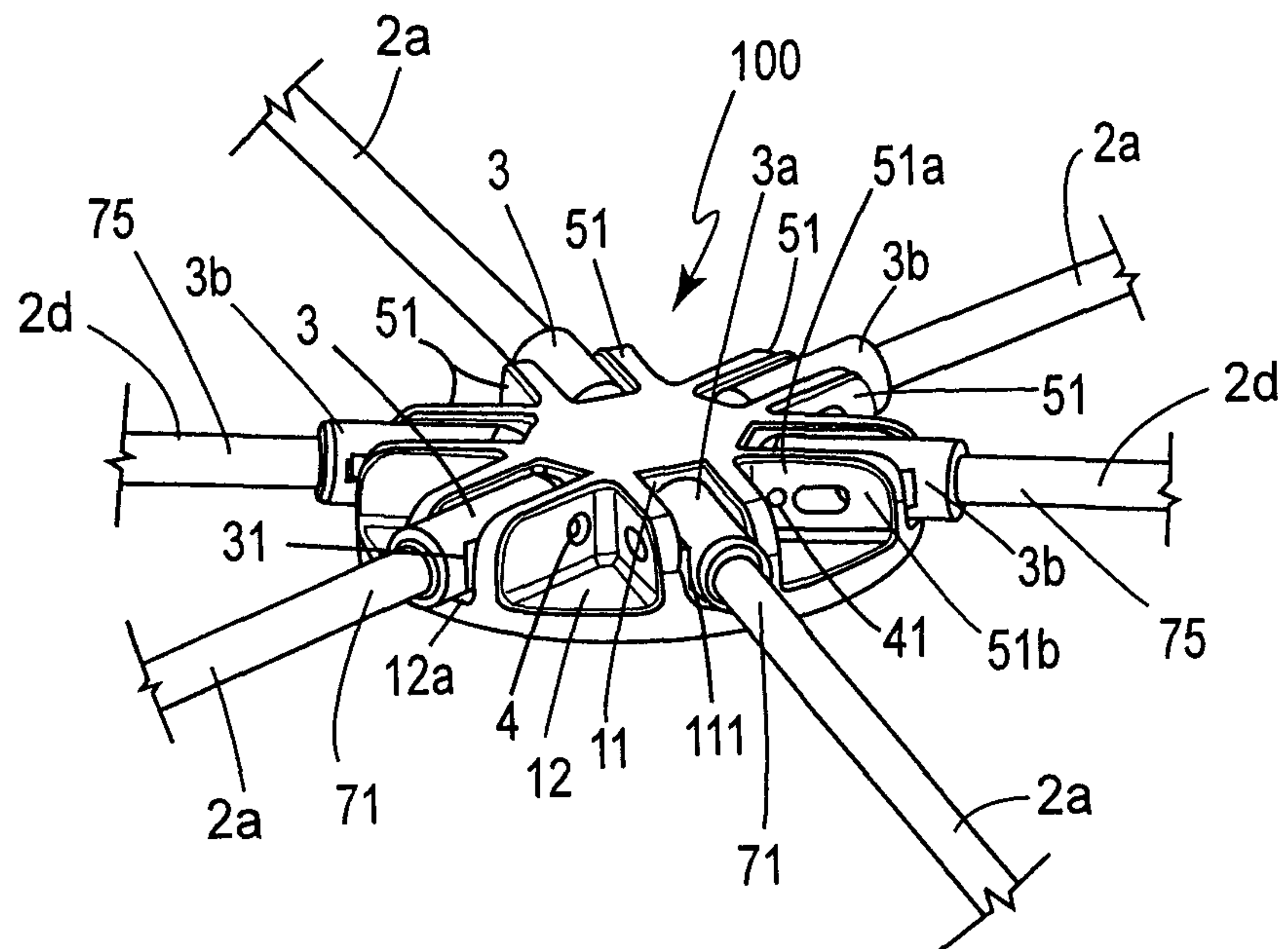


FIG. 7

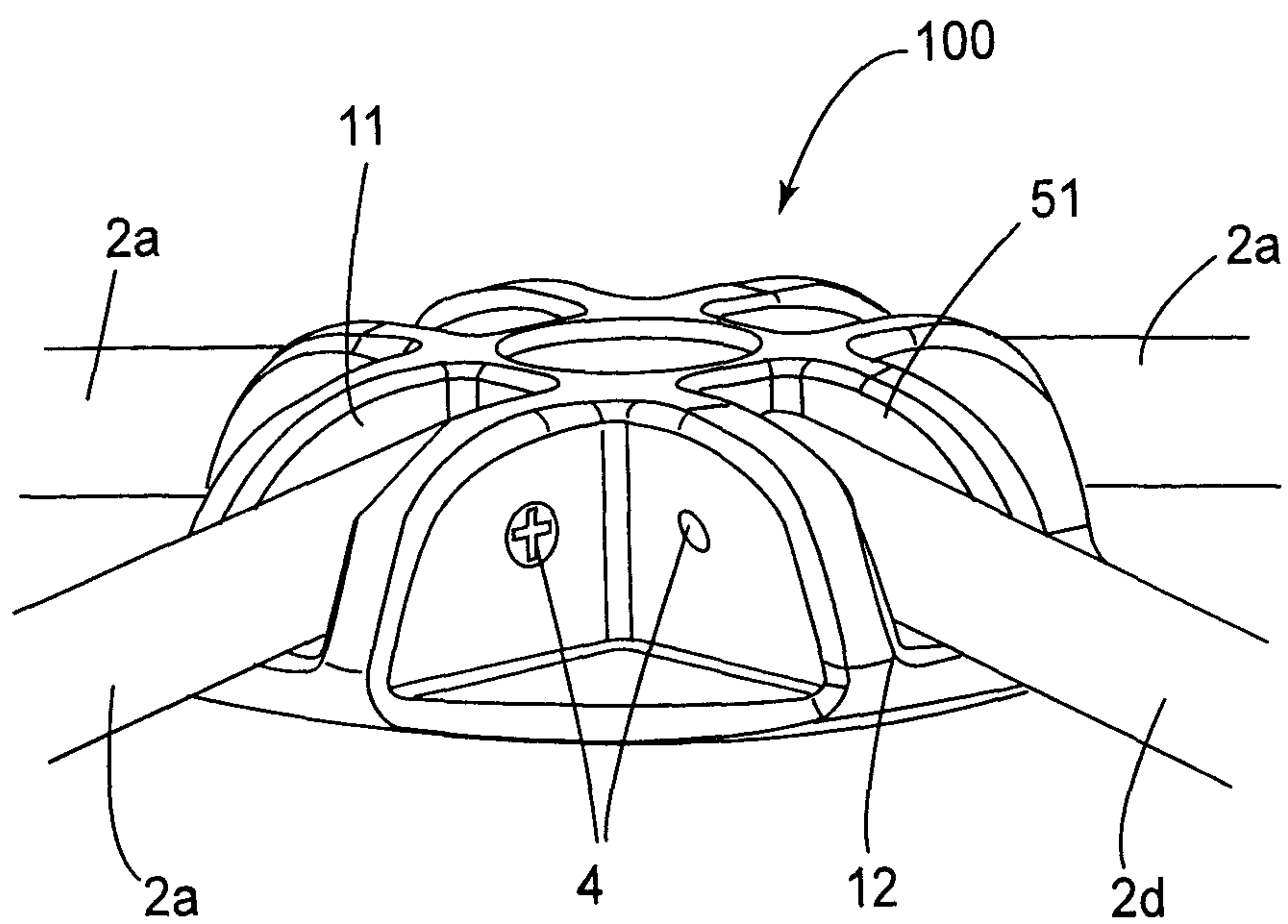


FIG. 8A

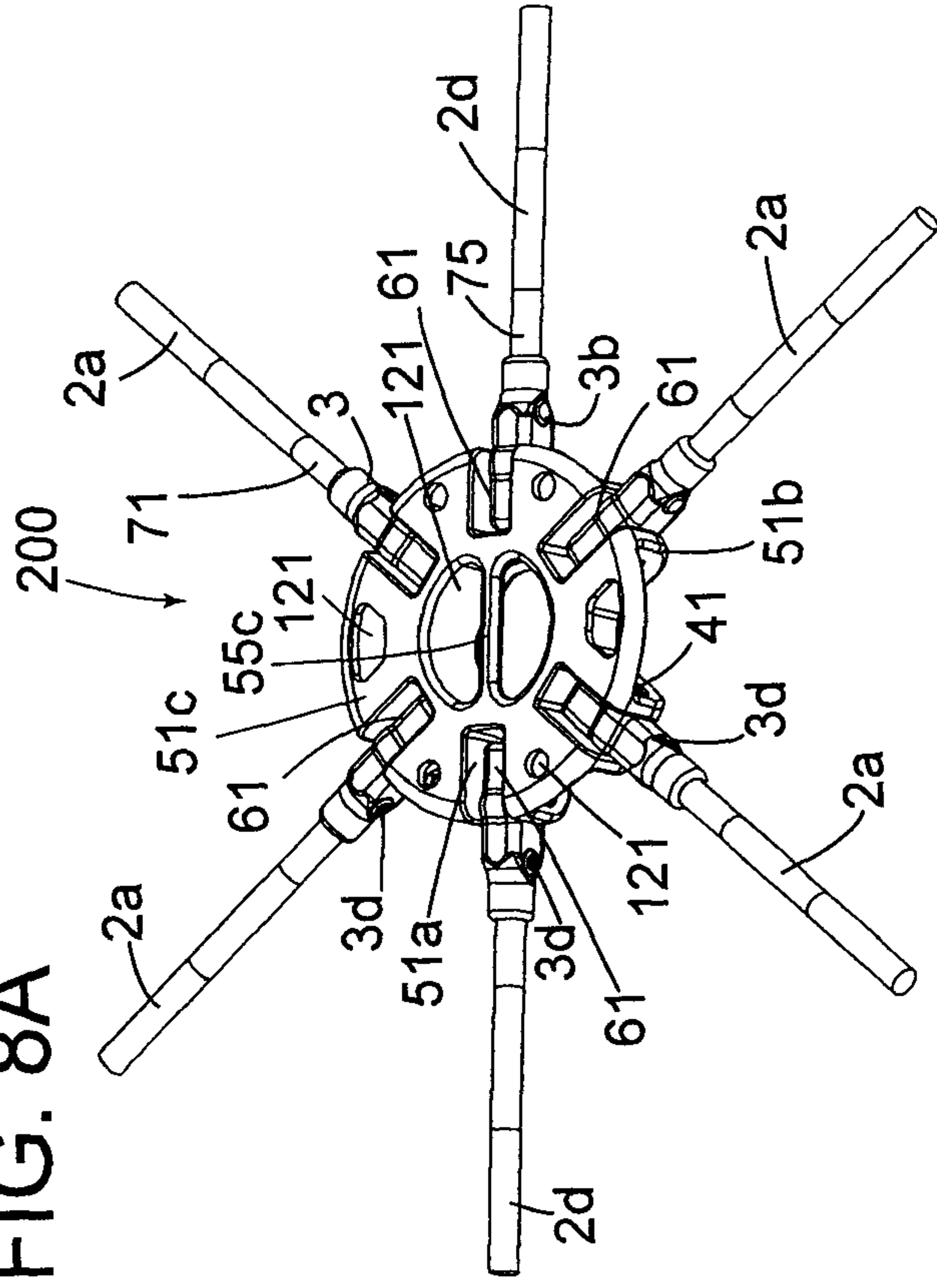


FIG. 8C

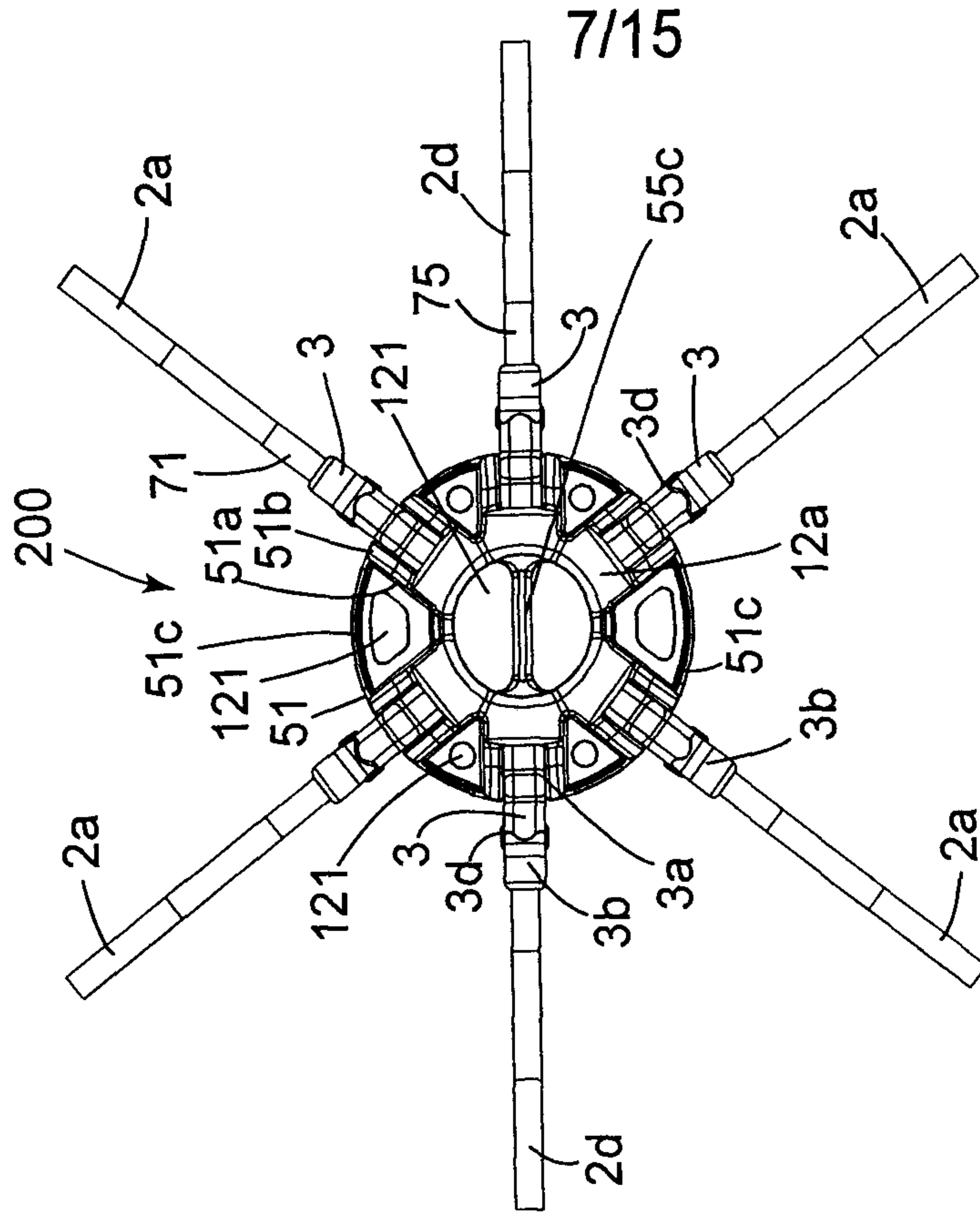


FIG. 8B

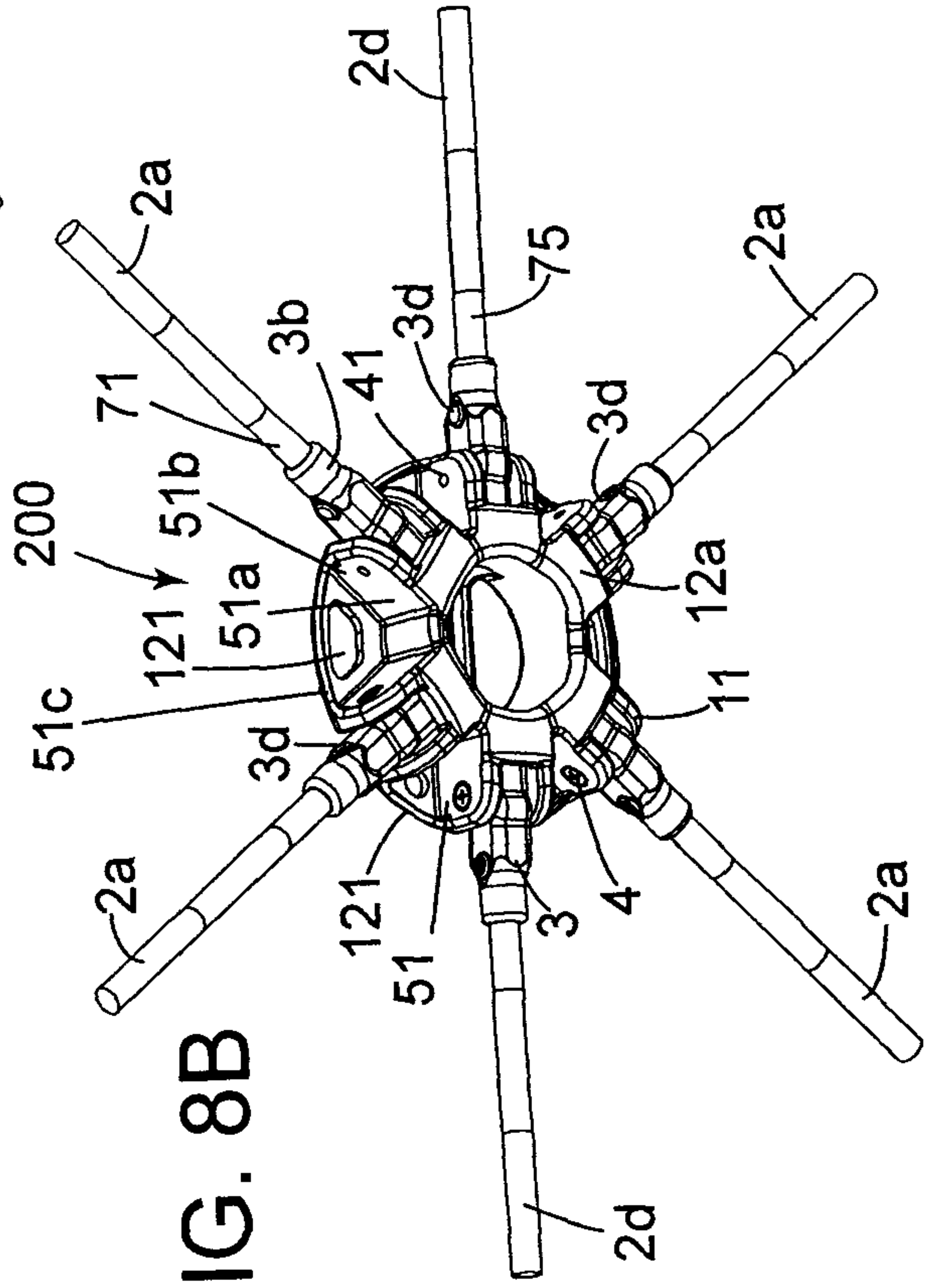
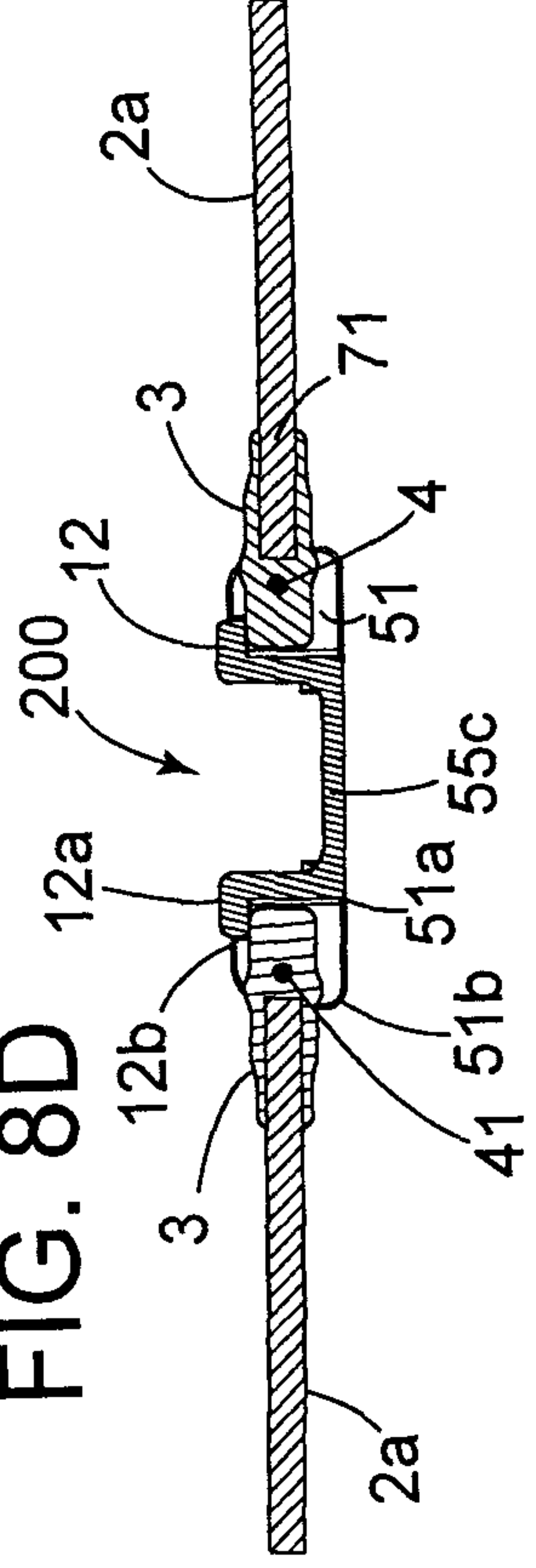


FIG. 8D



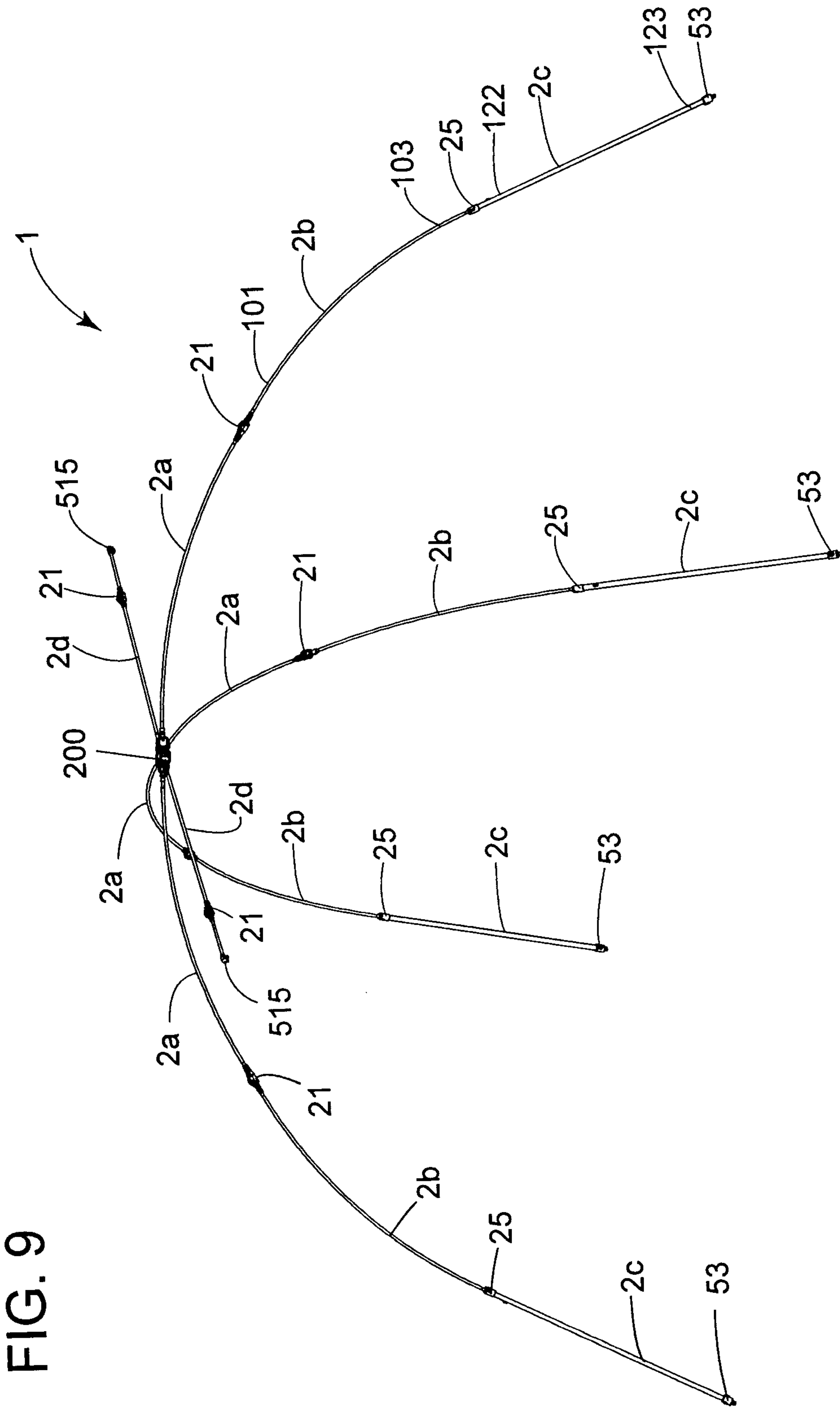


FIG. 9

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FIG. 10

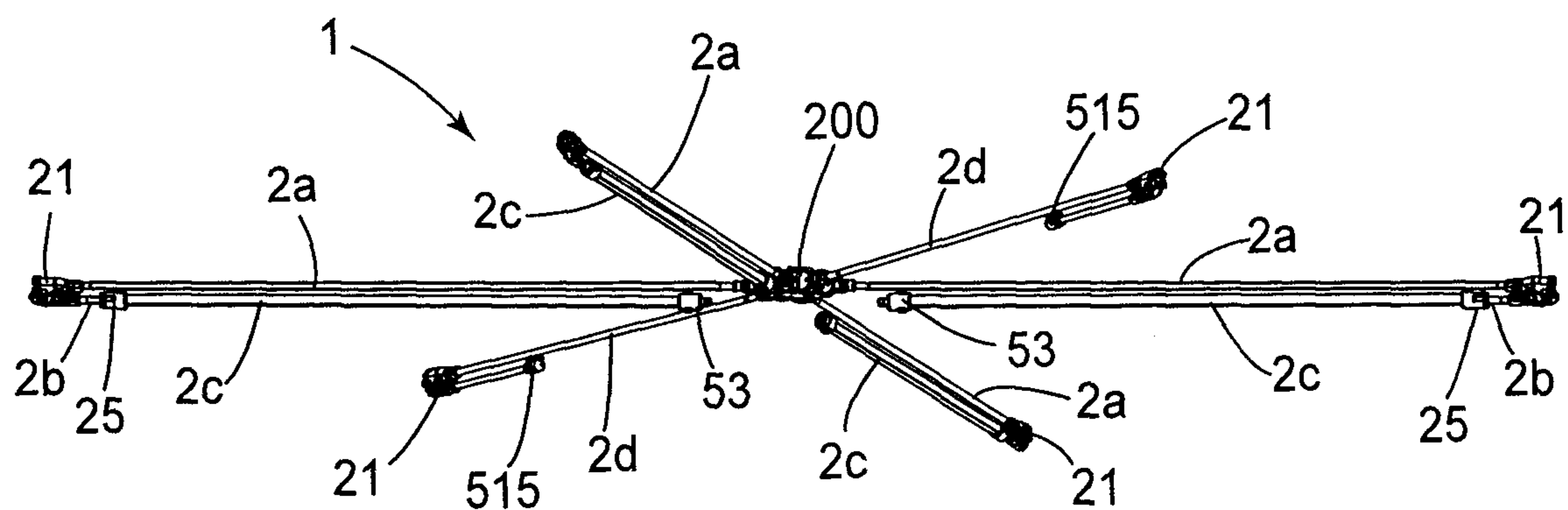


FIG. 11B

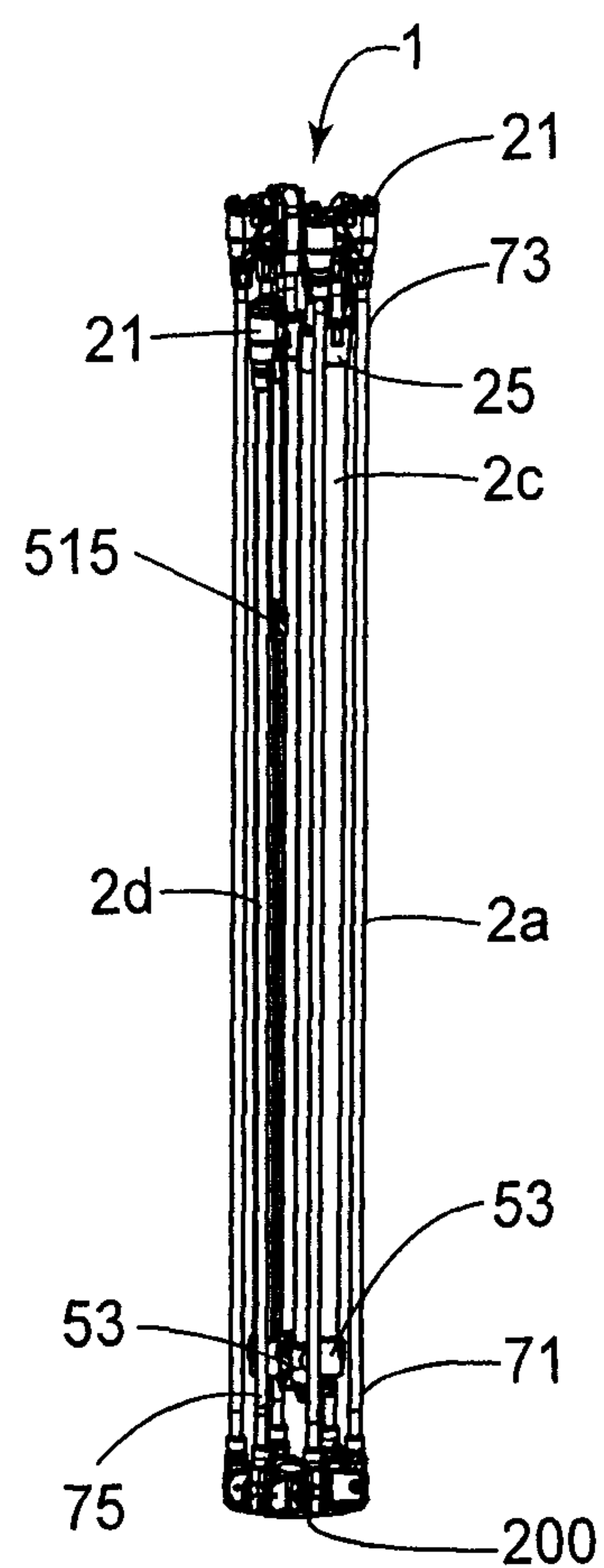
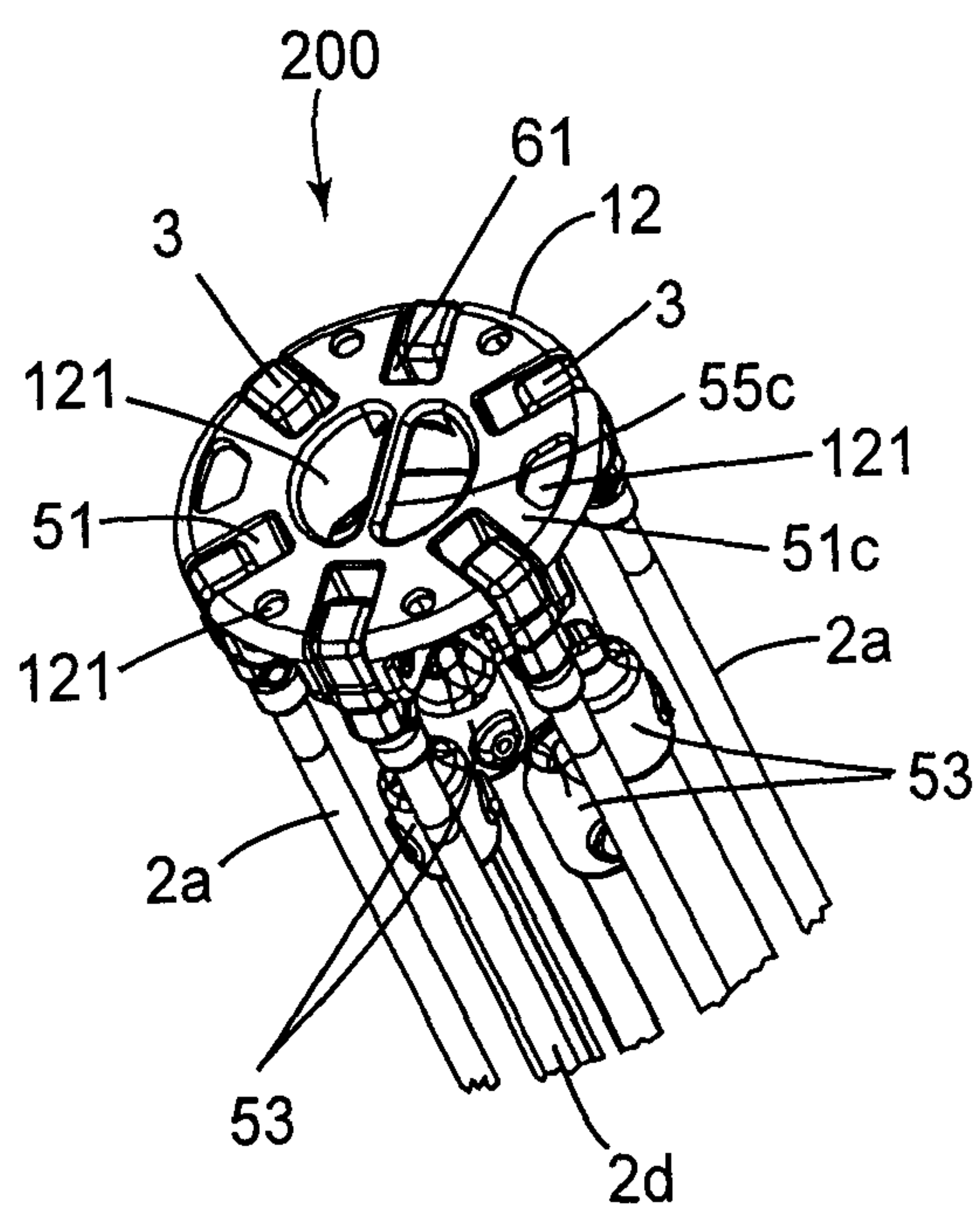
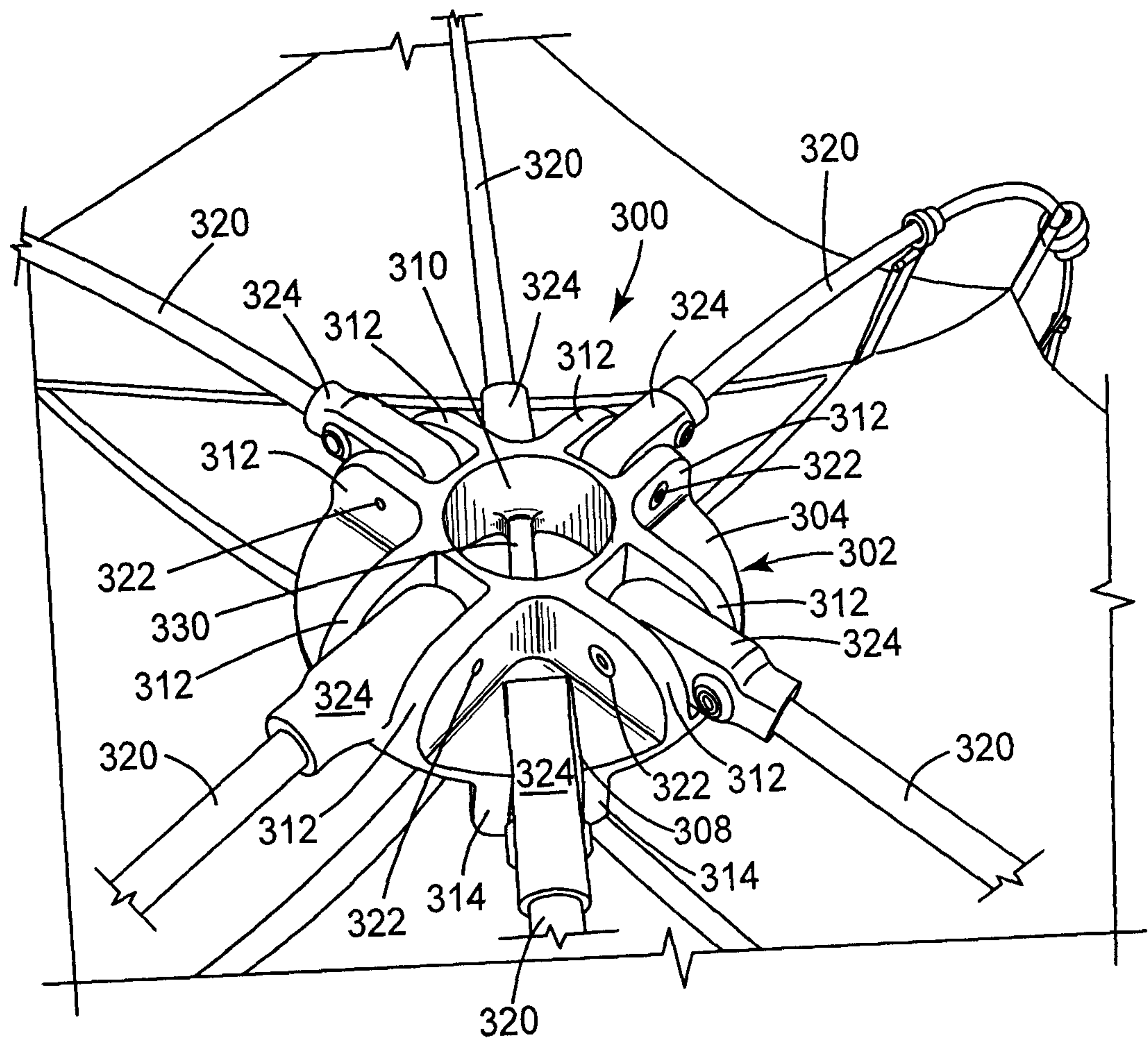


FIG. 11A



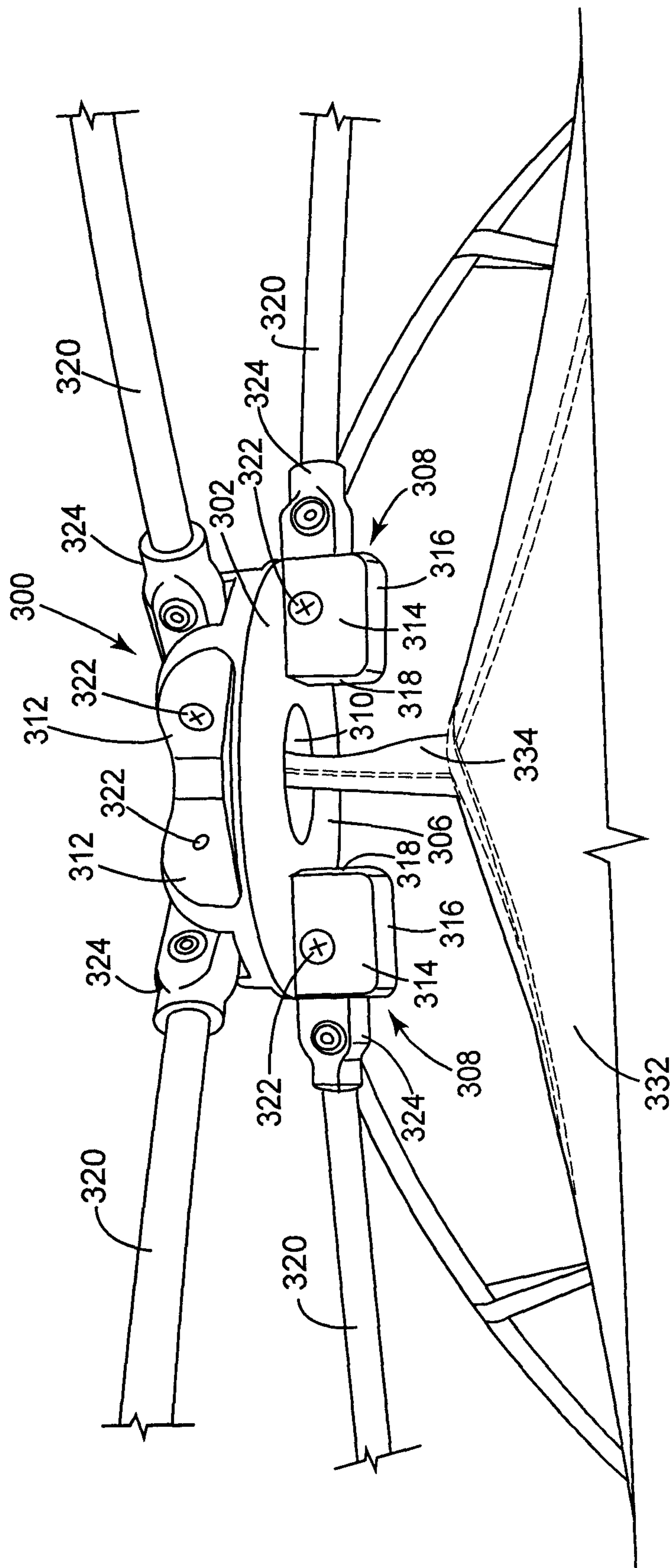
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FIG. 12



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FIG. 13



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FIG. 14

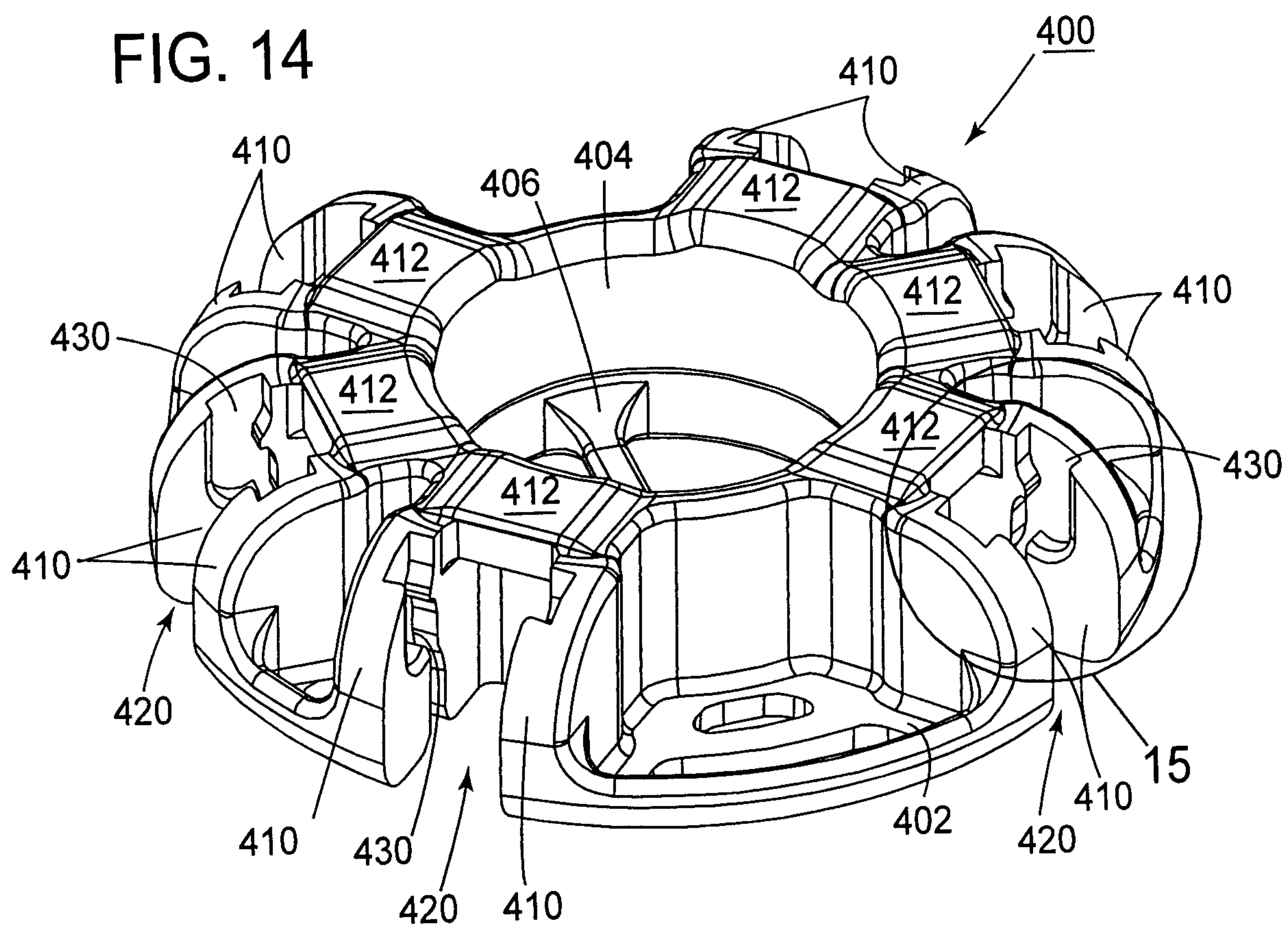
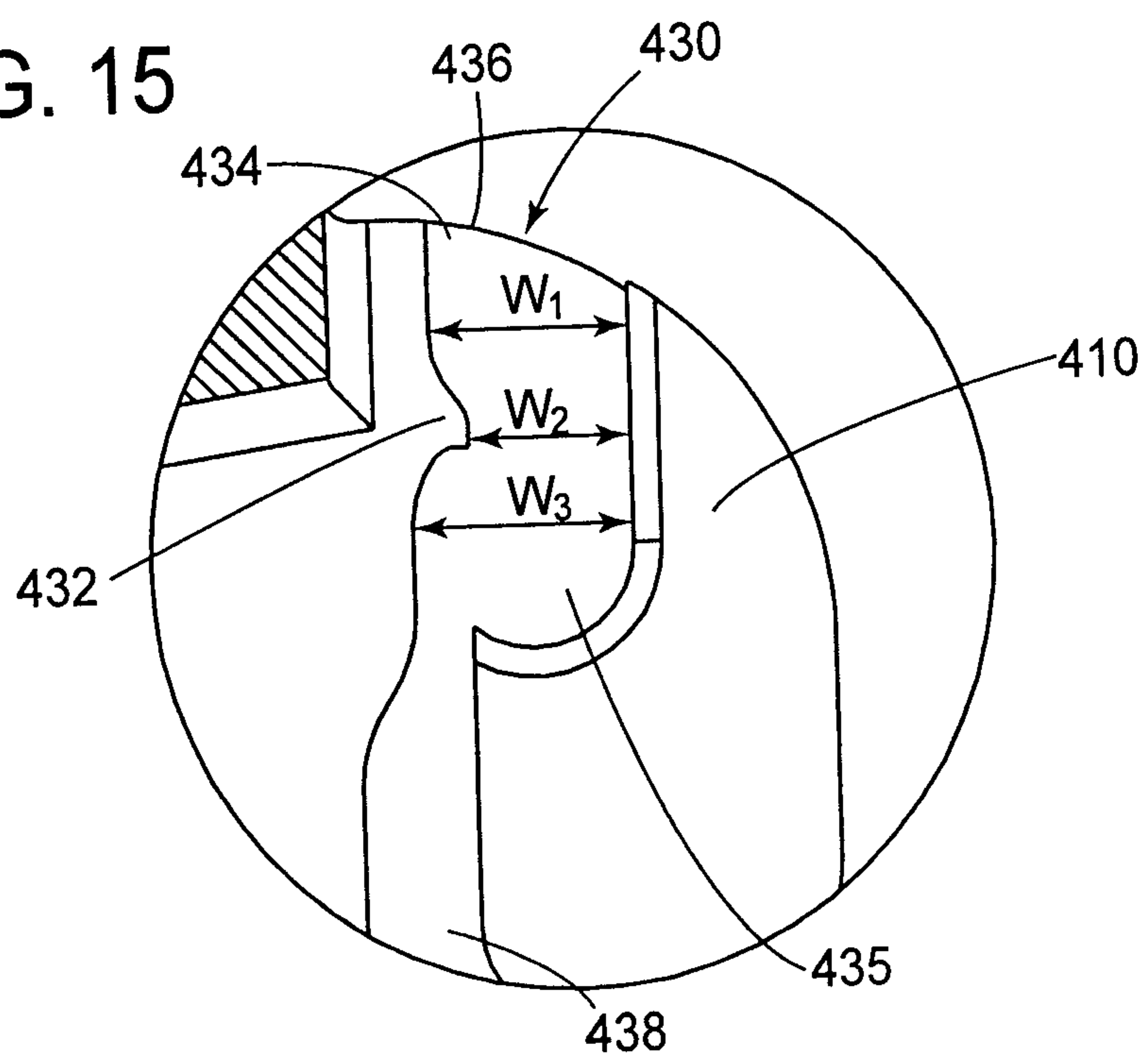


FIG. 15



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FIG. 16

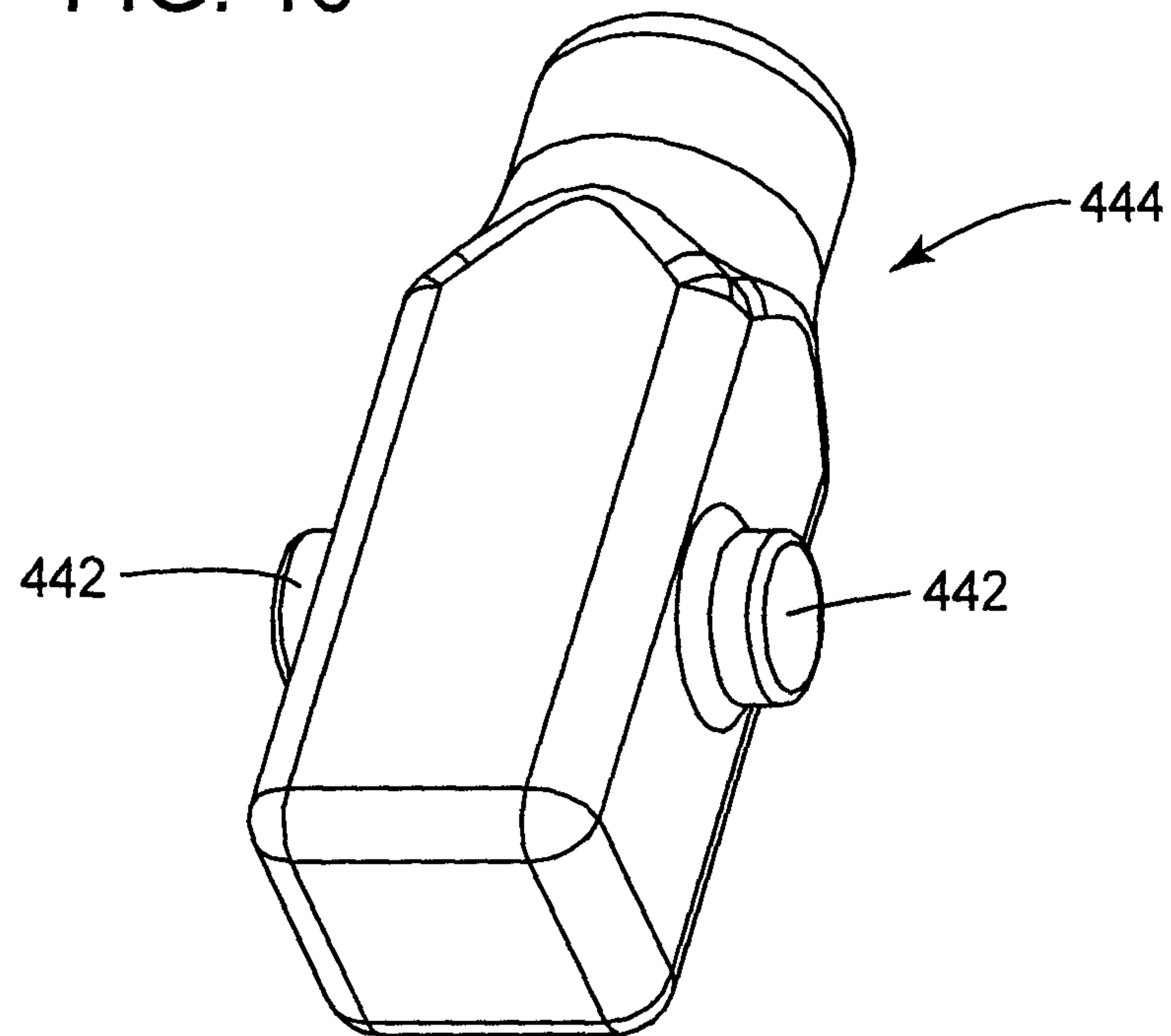
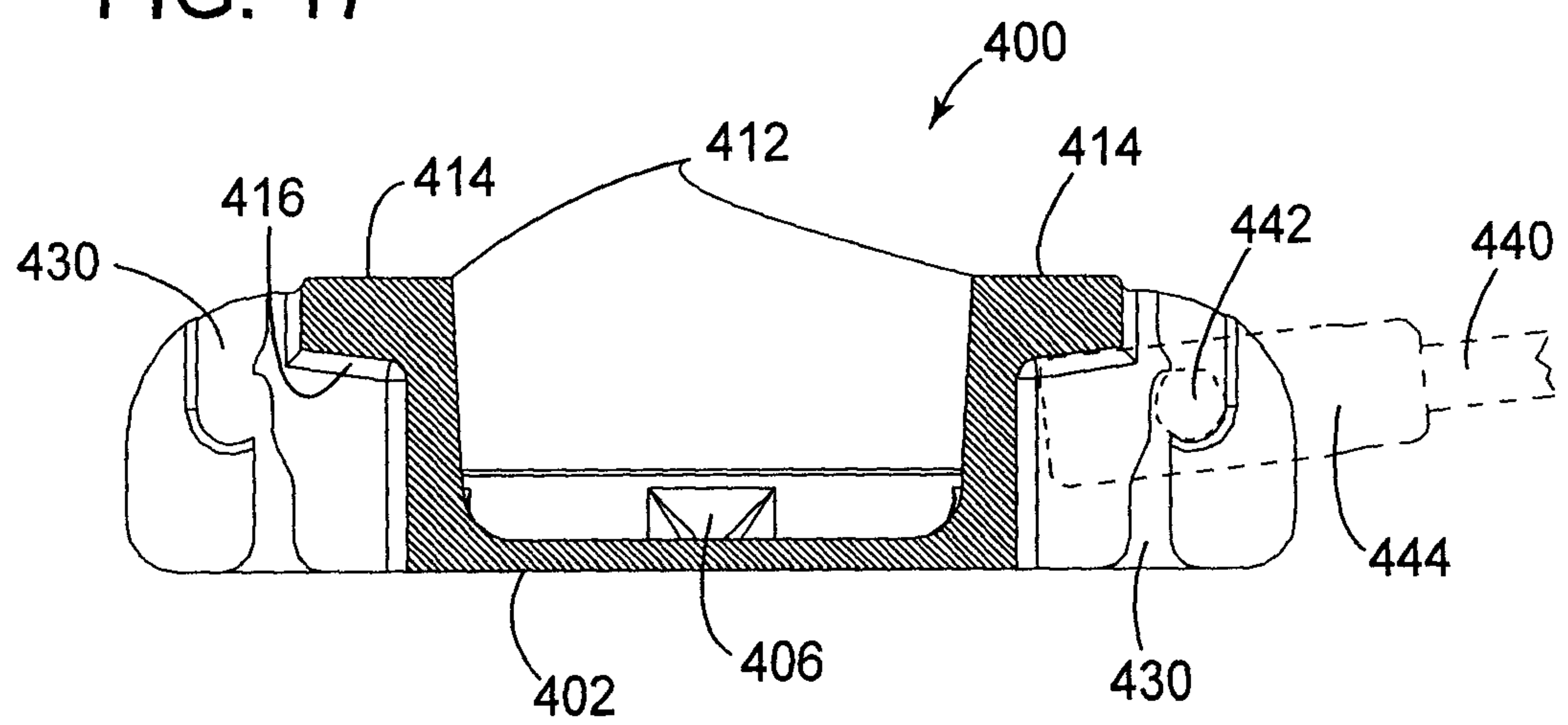


FIG. 17



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FIG. 18

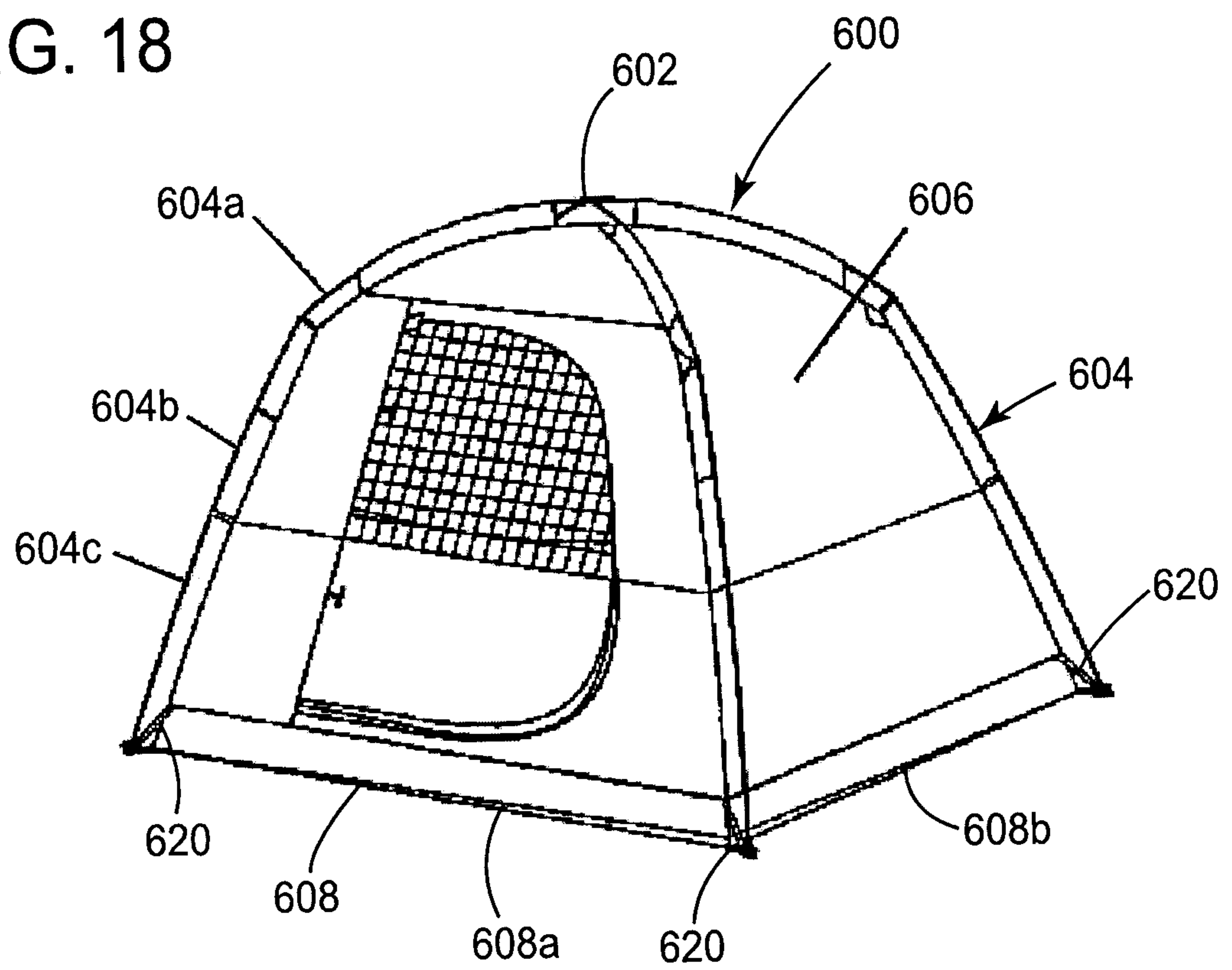
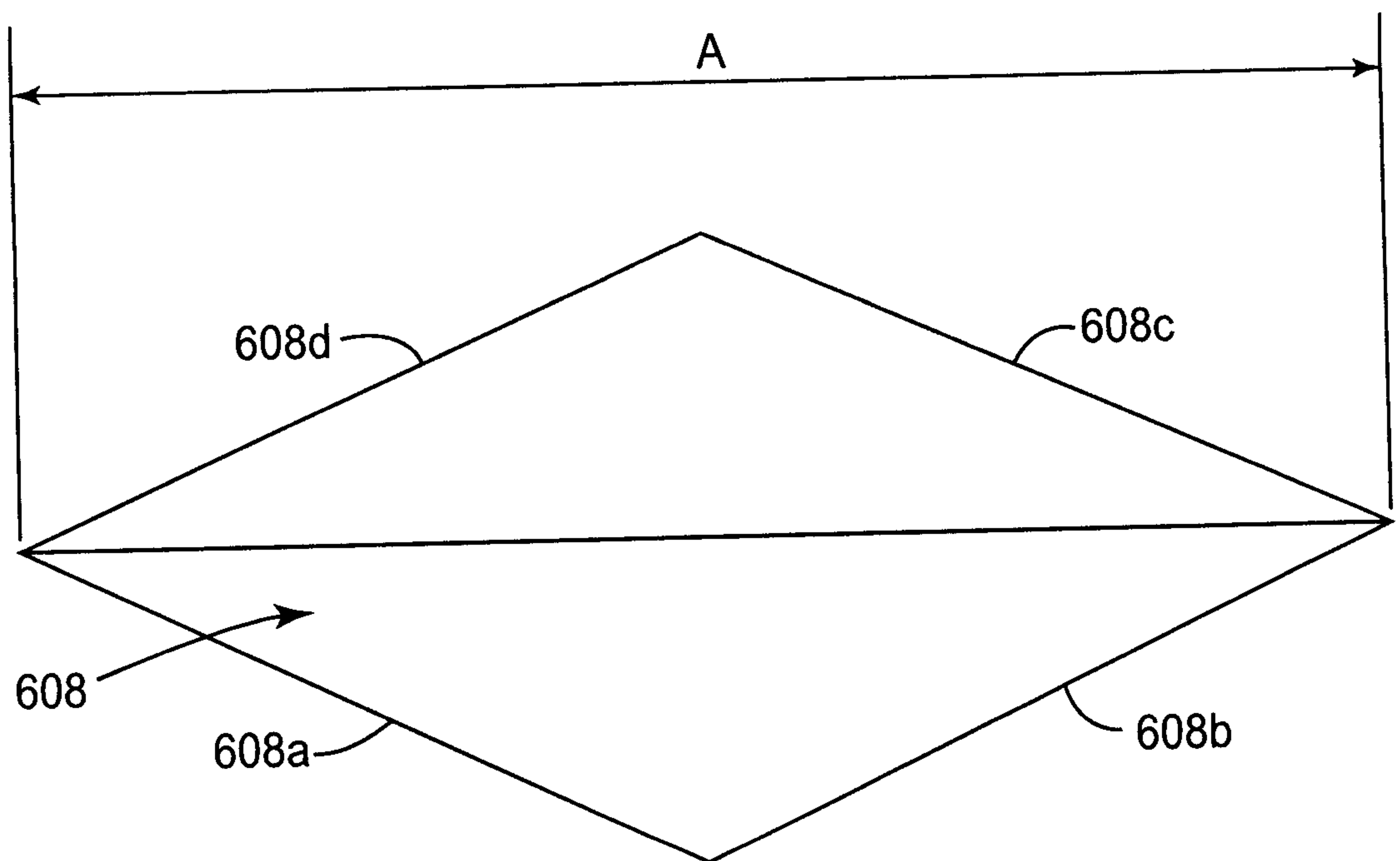


FIG. 19



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FIG. 20

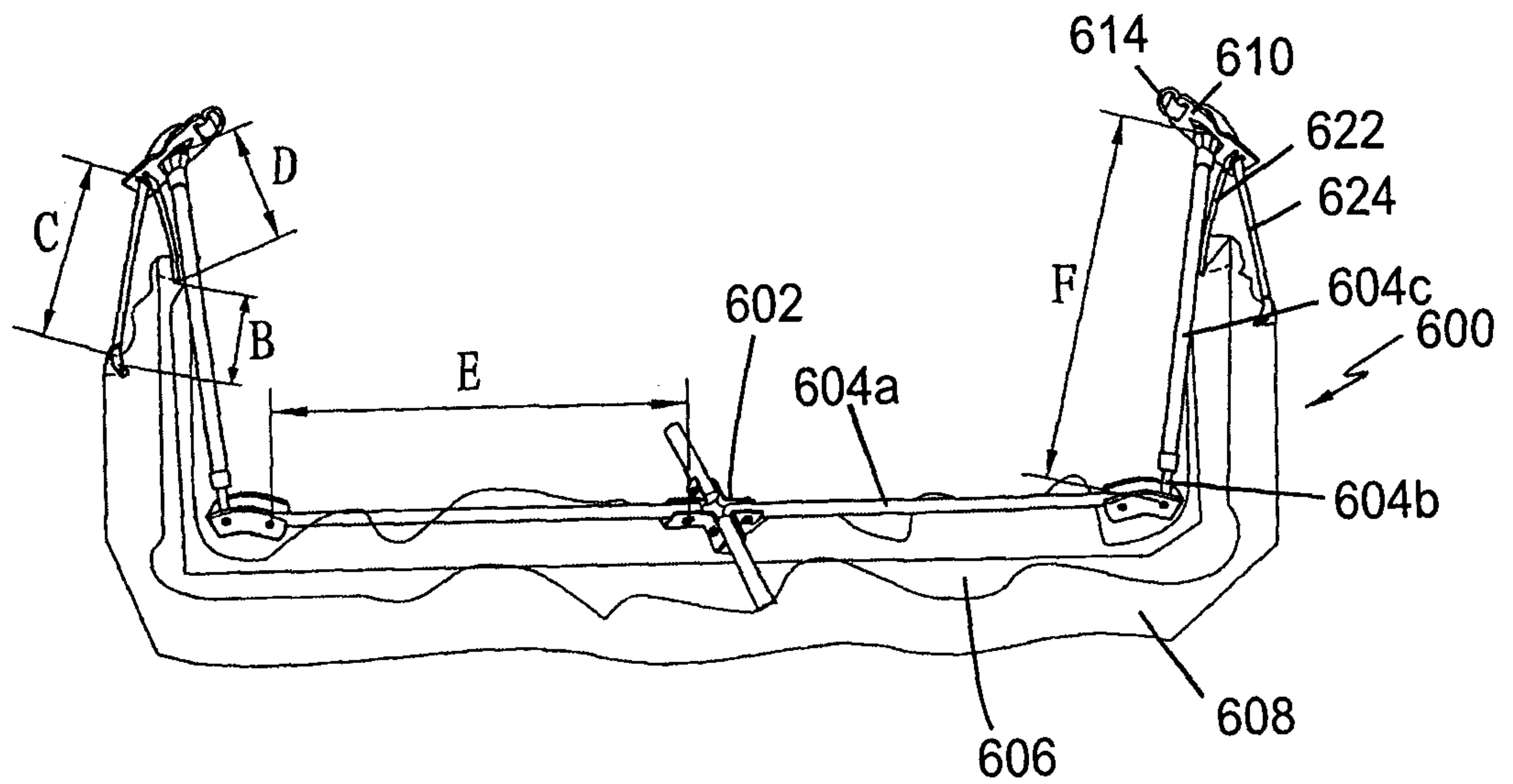


FIG. 21

