

Description

Background of the Invention

1. Field of the Invention

[0001] The present invention relates to a portable structure for providing temporary protection for at least one person from environmental conditions. A typical example of such an application would be for anglers in situations where they are required to maintain a position at a river bank or similar for a considerable period of time.

2. Description of the Related Art

[0002] Portable structures for anglers are known and in many situations conflicting constraints exists in terms of portability, easy erection, strength and affordability. Many structures of this type have disadvantages in that a degree of assembly is required in order to place the structure in its fully erect condition.

Brief Summary of the Invention

[0003] According to an aspect of the present invention there is provided a portable structure for providing temporary protection for at least one person from environmental conditions, comprising: a sheet; a mounting block; a plurality of support arms secured to said mounting block and arranged to extend outwards from said mounting block to support said sheet when in an erected condition, a plurality of said support arms being arranged to fold away from said erect condition into a storage condition, characterised in that said mounting block comprises: a first part to which a number of said support arms are connected; a second part to which a number of said support arms are connected; and hinging means connecting said first part to said second part, such that said structure is erected by a relative movement of said first and second parts about said hinging means.

[0004] Preferably said first and second parts of said mounting block are each configured to receive a lever, which assist said relative movement about said hinging means.

Brief Description of the Several Views of the Drawings

[0005]

Figure 1 shows a portable structure **102** being used by an angler;
Figure 2 shows the portable structure **102** after support arms **104** have been spread out;
Figure 3 shows a side view of the partly opened structure **102**;
Figure 4 shows the portable structure **102** identified

in *Figure 3* in its fully erect condition;
Figure 5 shows the user enjoying the shelter of the structure **102**;
Figure 6 shows the end of support arm **104a** attached to sheet **105**;
Figure 7 shows an enhanced embodiment in which a second fabric sheet **701** is also secured to the ends of the support arms **104**, such that it lies to the outside of said support arms;
Figure 8 shows a detailed isometric view of the mounting block **103** of *Figure 1*;
Figure 9 shows the mounting block **103** with its two halves **301** and **302** latched together;
Figure 10 shows a cross-sectional view of the mounting block **103**, indicated by line X-X in *Figure 9*, *Figure 11* shows an alternative embodiment in which the support arms **1104** comprise of two pieces of tubing which are connectable at a joint **1120**;
Figure 12A and 12B show two halves of an alternative mounting block of a portable structure, which may be separated when the structure is in its storage condition;
Figure 13 shows a cross-section of the mounting block of *Figures 12A and 12B* before its two parts **1201** and **1202** are hooked together;
Figure 14 shows the mounting block of *Figure 13*, after the tongues **1222** have been inserted into slots **1221**; and
Figure 15 shows the mounting block of *Figure 14*, after rotation of the two part **1201** and **1202** about the end portion **1301** of plate **1203**.

Written Description of the Best Mode for Carrying Out the Invention

Figure 1

[0006] A portable structure **102**, being used by an angler, is illustrated in *Figure 1*. The structure has been carried to a position on a river bank in a suitably designed bag **101**. The portable structure, in the preferred embodiment, provides a robust shelter under extreme environmental conditions. Furthermore, it may be necessary to assemble the structure in less than ideal conditions therefore the assembly procedure is relatively straightforward while at the same time, when in its erect condition, the structure is robust and resilient to extreme weather.

[0007] The structure comprises of a mounting block **103**, to which are attached a number of support arms **104**, and a waterproof fabric sheet **105** attached to said support arms. In the storage condition shown in *Figure 1*, the support arms are folded away such that they are substantially parallel to each other.

[0008] The angler is not required to perform any detailed assembly of the structure and the assembly procedure is initiated by simply removing the structure **102** from bag **101**.

[0009] Having removed the structure **102** from the bag **101** the structure is laid out such that said support arms are moved circumferentially so as to spread them out.

Figure 2

[0010] The portable structure **102** is shown in *Figure 2* after the support arms **104** have been spread out. The structure has a total of nine support arms of which five support arms **104A**, **104B**, **104C**, **104H** and **104I** are shown in *Figure 2*, with the remaining four being hidden behind the sheet **105**. The sheet **105** has nine elongated open-ended pockets, such as pocket **201**, in which a respective support arm resides, so that the support arms support the fabric sheet when the structure is erect.

[0011] The mounting block **103** comprises of two halves each having a hole **202** which allow a pair of levers to be connected to the mounting block to facilitate the erection of the structure **102**.

Figure 3

[0012] A side view of the partly opened structure **102** is shown in *Figure 3*. As previously mentioned, the mounting block **103** comprises of two halves **301** and **302**, and these are connected to each other by a hinge **303**. Five of the support arms **104A**, **104B**, **104C**, **104H** and **104I** are attached to the first part **301** of the mounting block **103**, while the other four support arms **104D**, **104E**, **104F** (shown in *Figure 4*), and **104G** (shown in *Figure 4*) are attached to the second part **302**.

[0013] The levers **304** and **305** each comprise of a rigid rod, or alternatively a tube, shaped to be a good fit within the holes **202**. The levers provide the user with sufficient leverage to rotate the two parts **301** and **302** with respect to each other so as to erect the structure **102**.

[0014] As the two levers are brought together, the relative movement of the two parts of the block **103** and the consequent movement of the support arms causes the sheet **105** to become tensioned and the support arms to extend radially from said support block.

[0015] When the structure **102** has been fully opened in this manner, the relative positions of the two parts **301** and **302** of the support block **103** is fixed by a latch (shown in *Figures 8* and *9*).

Figure 4

[0016] The portable structure **102** identified in *Figure 3* is shown in its fully erect condition in *Figure 4*. Some of the support arms **104D** to **104G** are pegged to ground by means of loops **401**, **402**, **403** and **404** attached to the ends of said support arms. Furthermore, support rods **405** are secured to support arms **104H** and **104C** so as to orientate the portable structure in a desired operating configuration. Additional support rods may sim-

ilarly be secured to front support arms **104I** and **104B** as required by the environmental conditions.

[0017] When the structure is in the erect condition, shown in *Figure 4*, support arm **104A** is arranged to be higher than any of the remaining support arms. Consequently, sections **406** of the sheet **105**, at the top of the structure are provided with a slope to assist run-off of water in wet weather.

[0018] As shown in *Figure 4*, the support arms **104A** to **104I** define a dome shape and the fabric sheet **105** is suspended inside said arms. In an alternative embodiment, the sheet **105** is attached such that it lies outside of the support arms **104**. A flap is provided within the sheet to allow access to the mounting block **103** for the purposes of erecting and collapsing the structure. The flap may be of a similar construction to that described below with reference to *Figure 7*.

Figure 5

[0019] The user is shown enjoying the shelter of the structure **102** in *Figure 5*, in a seated position. However, it should also be noted that the structure provides sufficient space for a bed for the user when required.

[0020] A portion of sheet **105** extends away from the support arms **104** and downwards to provide a front wall **501** for the structure **102**. An opening in the wall **501** provides an entrance to the structure.

[0021] Further securing of the structure is provided by pegging down rings **503** attached to the fabric sheet **105**.

Figure 6

[0022] The fabric sheet **105** is secured to the underside of the radially extending support arms **104** by means of the pockets **201**. Furthermore, the sheet **105** is permanently attached to the end of each of the support arms **104**. Thus, when the structure is in its stored condition, when it is in its erect condition, and during its erection, one end of each support arm **104** is attached to the mounting block **103** while the opposite ends are attached to the sheet **105**.

[0023] By way of example, the end of support arm **104A** is shown in *Figure 6* attached to sheet **105**. The sheet **105** has an upturned edge portion **601** secured to the end **602** of support arm **104A** by means of a screw **603** and a washer **604**. However, it should be appreciated that alternative securing mechanisms may be deployed in order to permanently attach one or more fabric sheets to the support mechanism. Thus, these attachments may remain permanently in position for many operations of the device. However, the screw fastenings etc. do allow the sheet to be removed for repair or replacement as and when this becomes necessary.

[0024] The upturned edge **601** is attached to the adjacent support arms **104B** and **104I** in a similar manner, so that rain water running off the sheet **102** is directed

away from the entrance in wall 501.

Figure 7

[0025] In an enhanced embodiment, as illustrated in *Figure 7*, a second fabric sheet 701 is also secured to the ends of the support arms 104 but in a manner such that it lies to the outside of said support arms. Therefore, the second sheet 701 lies substantially in parallel with the first fabric sheet 104 which lies under the support arms. In this way, the portable structure is provided with a double skin which, when required for relatively long durations, such as for overnight use, significantly reduces problems associated with condensation.

[0026] The mounting block 103 is protected in the embodiment shown in *Figure 7* by means of an secured flap 702, preferably attached to the sheet 701 by stitching 703 along one edge and a hook and loop mechanism such as Velcro (registered trademark) along the remaining edges. When the structure of *Figure 7* is to be placed back into its storage condition, the flap 702 is lifted, thereby giving access to the mounting block 103. Thus, the latch of the mounting block may be undone to allow the two halves of said block to fold-up about the hinge 303, effectively performing the reverse process to that shown in *Figure 3*.

[0027] Similarly, when the structure of *Figure 7* is being erected, access is provided to the mounting block 103 via the flap 702, and the erection process is substantially the same as shown in *Figures 2* and *3*.

[0028] Thus, in this way, it is possible to erect a double skinned portable structure with relatively minimal effort, given that the underskin 105 and the outer skin 701 remain permanently secured to the plurality of support arms 104. Furthermore, these arms are rapidly positioned into their erected condition by merely hinging the two parts of the mounting block as described with reference to *Figure 3*.

Figure 8

[0029] A detailed isometric view of the mounting block 103 of *Figure 1* is shown in *Figure 9*. Each of the two halves 301 and 302 of the mounting block 103, comprises of a pair of metal plates 801A and 801B, and 802A and 802B respectively. The hinge 303 connects the lower plates 801A and 802A of the two parts 301 and 302 respectively.

[0030] An end of each support arm 104B to 104I is sandwiched between the plates 801A and 801B, or 802A and 802B and held in place by a pivot mechanism 803.

[0031] If all of the support arms were allowed to pivot, inward forces from said arms would tend to rotate the mounting block such that they are no longer arranged in a truly radial manner. For this reason, the remaining support arm, 104A, is rigidly attached to part 301, so that it cannot pivot. Consequently, when the structure is

erected, the pivotable support arms 104B to 104I are oriented with respect to support arm 104A to ensure that they extend radially from the mounting block.

[0032] Tubes 805 and 804 are each rigidly attached, for example by a suitable adhesive (or alternatively press-fitting), to a respective pair of plates 801A and 801B, or 802A and 802B, such that a flanged end of each of said tubes protrudes from the upper outer surface of the mounting block 103. The tubes 805 and 804 define the holes 202 in the mounting block and, therefore, during erection of the structure, the tubes 805 and 804 receive the ends of levers 304 and 305.

[0033] A latching member 806 has a first end permanently attached to the flanged end of tube 804 such that it may swivel about it; the flange preventing the latching member from sliding off said tube. The other end of the latching member is hook shaped, such that when the structure is being erected, the latching member 806 is hooked around the tube 805, to lock the two parts 301 and 302 of the mounting block 103 in position.

Figure 9

[0034] The mounting block 103 with its two halves 301 and 302 latched together is shown in *Figure 9*. As described above, the hooked end of the latching member 806 is hooked around the tube 805 to hold the part 301 in a fixed position relative to part 302.

[0035] As illustrated by *Figure 9*, the axis of the hinge 303 is perpendicular to the direction of the fixed support arm 104A, and consequently it is horizontal when the structure is erect. This configuration has been found preferable to facilitate the erection of the structure, because it allows the support arms 104 to be spread out in a substantially horizontal plane, as shown in *Figure 2*, with the rear arms 104E and 104F lowermost.

[0036] Alternative types of latching mechanisms may be used to that illustrated in *Figure 8* and *9*, which allow the two halves of the mounting block to be releasably held together when the structure is erect.

Figure 10

[0037] A cross-sectional view of the mounting block 103, indicated by line X-X in *Figure 9*, is shown in *Figure 10*. The fixed support arm 104A is held between the plates 801A and 801B by bolts 1001 and 1002. Bolt 1001 passes through the upper plate 801B, a washer 1003, a metal sleeve 1004, a second washer 1005, the lower plate 801A, and is fixed in place by a hexagonal nut 1006. The sleeve 1004 is located within a hole which extends through the tubular wall of support arm 104A and a solid metal cylinder 1007 which is fixed within said arm adjacent to its end. The cylinder 1007 provides the arm with additional strength at its connection to the mounting block 103.

[0038] In the present example, the cylinder 1007 is made from aluminium and it is crimped in place within

an aluminium tube support arm, but alternatively it may be bonded in place by a suitable adhesive. In alternative embodiments, the support arms are manufactured from a man-made material such as fibre glass, and the cylinder is bonded in place.

[0039] The sleeve **1004** is slightly longer than the outside diameter of the support arm **104A**, and consequently without the second bolt **1002** the support arm **104A** would be free to pivot about bolt **1001**. In fact, the pivot mechanisms **803** of the pivotable support arms **104B** to **104I** comprise of a single such bolt assembly. However, support arm **104A** does have the second bolt **1002** to prevent pivoting. Thus, the bolt **1002** passes through the upper plate **801A**, a washer **1008**, a sleeve **1009** located within a second hole in said support arm, a second washer **1010**, and is held in place by a nut **1011**.

[0040] To assist construction of the structure, the lower plates **801A** and **801B** may be fabricated with hexagonal recesses, about the bolt holes, to receive nuts, such as nuts **1006** and **1011**.

Figure 11

[0041] In the main embodiment, as shown in *Figure 4*, each of the support arms **104** consists of a single length of aluminium tubing which extends from the mounting block **103** to a fabric sheet attachment device, such as that shown in *Figure 6*. The support arms are pre-formed to provide the required dome-shape of the structure.

[0042] Alternatively, the support arms are single straight lengths of carbon fibre, or glass fibre, reinforced rod, or flexible aluminium alloy tubes which flex to the required shape of the structure during the erection process.

[0043] A further alternative embodiment is shown in *Figure 11*. The structure **1102** is substantially the same as structure **102** except that support arms **1104** comprise of two pieces of tubing which are connectable at a joint **1120**. To form the joints **1120**, one of the two pieces of tubing has an end portion with a reduced diameter which is a good fit within the other piece. Each support arm is located in a pair of fabric pockets **1101A** and **1101B** spaced apart to allow the user access to the joint **1120**. Thus, when the structure **1102** is to be erected, the user firstly connects the two pieces of each support arm before spreading them out in the manner of *Figure 2*, and then completing the erection as illustrated by *Figure 3*. When the structure **1102** is to be stored, it is collapsed by unhooking the latching member on the mounting block and folding the support arms together. The two pieces of the support arms **1104** are then separated at joints **1102**. This allows the outer piece of each support arm to be folded back alongside the respective inner piece. Consequently, the length of the structure **1104** when folded is approximately half of the length of the structure **104** when it is folded.

[0044] In an alternative embodiment, the joint **1120** between the two pieces of tubing may be hinged.

Figures 12A and 12B

[0045] In a further alternative embodiment, a portable structure is substantially the same as the structure **102** except that the two halves of the mounting block may be separated when the structure is in the storage condition. The two halves **1201** and **1202** of the alternative mounting block are illustrated in *Figures 12A* and *12B* respectively. The mounting block of *Figures 12A* and *12B* is substantially the same as mounting block **103**, except that instead of a hinge, mounting block part **1201** has three linear slots **1221** arranged parallel to a straight edge **1223** of its lower plate **1224**, and mounting block part **1202** has three curved tongues **1222** extending from an edge of its lower plate. Three narrow portions of the lower plate **1224** between the three slots **1221** and the edge **1223** provide three spindles **1225**.

[0046] The three slots **1221** are dimensioned to receive the three tongues **1222**, and the spindles **1225** are configured to be located within a curved part of said tongues. During erection of the structure, when the tongues **1222** are inserted into the slots **1221**, the spindles **1225** and the tongues co-operate to provide a hinging means.

[0047] A latching member **1206** is rotatably attached to the mounting block part **1202**, in substantially the same manner as latching member **806** on mounting block **103**.

[0048] In alternative embodiments other numbers of slots are used, with a corresponding number of tongues.

Figure 13

[0049] The mounting block of *Figure 12A* and *12B* is shown in cross-section in *Figure 13*, before its two parts **1201** and **1202** are hooked together. The fabric sheet of the structure has not been shown in *Figure 13*, in order to simplify the illustration.

[0050] The three slots **1221** are formed along an edge portion **1301**, of lower plate **1203**, which extends substantially perpendicularly from the main part of said plate. The three tongues **1222** have a hooked shape with an end portion **1302** which extends backwards parallel to the main part of lower plate **1303** of mounting block part **1202**.

[0051] During erection of the structure, the end portions **1302** are slotted into slots **1221** until the spindles **1225** of plate **1203** are positioned within a curved portion **1304** of the tongues **1222**.

Figure 14

[0052] The mounting block of *Figure 13* is shown in *Figure 14*, after the tongues **1222** have been inserted into slots **1221**. Thus the spindles **1225** of plate **1203**

are positioned within the curved portion **1304** of tongues **1222**.

[0053] Having slotted the two parts of the mounting block together, the structure may then be erected in the same manner as structure **102** and described with reference to *Figures 2* and *3*. Thus, levers **304** and **305** are located within tubes **1405** and **1406**, and the two parts **1201** and **1202** of the mounting block are rotated about the spindles **1225** of plate **1203** to erect the structure.

Figure 15

[0054] The mounting block of *Figure 14* is shown in *Figure 15* after rotation of the two part **1201** and **1202** about the spindles **1225** of plate **1203**. When the structure is fully erect, the latching member **1206** is hooked around the top of tube **1405** to fix the position of part **1201** relative to part **1202**.

[0055] Thus, the mounting block of *Figure 15* comprises of two separate parts **1201** and **1202** which are not connected by a hinge as such. Instead, the slot and tongue arrangement provides a hinging means which allows a portable structure to be erected by a relative movement of two parts of a mounting block about a hinging means.

Claims

1. A portable structure (**102, 1102**) for providing temporary protection for at least one person from environmental conditions, comprising:

a sheet (**105**);
 a mounting block (**103**);
 a plurality of support arms (**104, 1104**) secured to said mounting block and arranged to extend outwards from said mounting block to support said sheet when in an erected condition, a plurality of said support arms being arranged to fold away from said erect condition into a storage condition, **characterised in that** said mounting block comprises:

a first part (**301, 1201**) to which a number of said support arms are connected;
 a second part (**302, 1202**) to which a number of said support arms are connected; and
 hinging means (**303, 1221** and **1222**) connecting said first part to said second part, such that said structure is erected by a relative movement of said first and second parts about said hinging means.

2. A portable structure according to claim 1, wherein a number of said plurality of support arms which fold away are attached to said first part, and a number

of said support arms which fold away are attached to said second part.

3. A portable structure according to claim 1 or claim 2, wherein said structure includes a fabric sheet (**105**) attached to said support arms when in said storage condition, and when in said erect condition.

4. A portable structure according to claim 3, wherein said portable structure includes a second fabric sheet (**701**) attached to said support arms when in said storage condition, and when in said erect condition, such that one of said fabric sheets is located inside the support arms and the other fabric sheet is located outside of the support arms.

5. A portable structure according to any of claims 1 to 4, wherein said hinging means is a hinge (**303**) and said first part (**301**) of said mounting block (**103**) is attached to said second part (**302**) when said structure is in said storage condition, and when in said erect condition.

6. A portable structure according to any of claims 1 to 5, wherein all of said support arms are attached to said mounting block both when said structure is in said storage condition, and when in said erect condition.

7. A portable structure according to any of claims 1 to 6, wherein a plurality of said support arms are pivotally attached to said mounting block.

8. A portable structure according to claim 7, wherein said structure has a fixed support arm (**104A**) which is rigidly attached to said mounting block to provide a reference from which the pivotally attached support arms are positioned when the structure is erected.

9. A portable structure according to any of claims 1 to 8, wherein one of said support arms (**104A**) extends higher than the remaining support arms in said erect condition, whereby a portion of fabric sheet (**105**) attached to said highest support arm (**104A**) is sloped to prevent water resting on top of said structure.

10. A portable structure according to any of claims 1 to 9, wherein said relative movement about said hinging means takes place about a substantially horizontal axis.

11. A method of erecting a tent (**102, 1102**) by spreading out a plurality of support arms (**104, 1104**) pivotally attached to a mounting block (**103**), **characterised in that:**

said mounting block comprises of two parts (301, 302, and 1201, 1202) connected by a hinging mechanism (303, 1221 and 1222) such that each of said two parts supports a plurality of said support arms; and
 said tent is erected by a relative movement of said two parts about said hinging mechanism.

Amended claims in accordance with Rule 86(2) EPC.

1. A portable structure (102, 1102) for providing temporary protection for at least one person from environmental conditions, comprising:

a sheet (105);
 a mounting block (103);
 a plurality of support arms (104, 1104) each having a first end secured to said mounting block and arranged to extend outwards from said mounting block to support said sheet when in an erected condition, a plurality of said support arms being pivotally attached to said mounting block and arranged to fold away from said erect condition into a storage condition,

wherein in an erected condition the structure is configured to suspend the mounting block above the ground at the first end of a plurality of the support arms which have a second end located on the ground, said portable structure being **characterised in that** said mounting block comprises:

a first part (301, 1201) to which a number of said support arms are connected;
 a second part (302, 1202) to which a number of said support arms are connected; and
 hinging means (303, 1221 and 1222) connecting said first part to said second part, such that said structure is erected by a relative movement of said first and second parts about said hinging means, whereby said sheet (105) is attached to said support arms when in said storage condition, when in said erect condition, and during erection.

2. A portable structure according to claim 1, wherein a number of said plurality of support arms which fold away are attached to said first part, and a number of said support arms which fold away are attached to said second part.

3. A portable structure according to claim 1 or claim 2, wherein said structure includes a fabric sheet (105) attached to said support arms when in said storage condition, and when in said erect condition.

4. A portable structure according to claim 3, wherein

said portable structure includes a second fabric sheet (701) attached to said support arms when in said storage condition, and when in said erect condition, such that one of said fabric sheets is located inside the support arms and the other fabric sheet is located outside of the support arms.

5. A portable structure according to any of claims 1 to 4, wherein said hinging means is a hinge (303) and said first part (301) of said mounting block (103) is attached to said second part (302) when said structure is in said storage condition, and when in said erect condition.

6. A portable structure according to any of claims 1 to 5, wherein all of said support arms are attached to said mounting block both when said structure is in said storage condition, and when in said erect condition.

7. A portable structure according to any of claims 1 to 6, wherein said portable structure comprises a latching mechanism (804, 805, 806) which allows the two parts of the mounting block to be releasably held together when the structure is erect.

8. A portable structure according to any of claims 1 to 7, wherein said structure has a fixed support arm (104A) which is rigidly attached to said mounting block to provide a reference from which the pivotally attached support arms are positioned when the structure is erected.

9. A portable structure according to any of claims 1 to 8, wherein one of said support arms (104A) extends higher than the remaining support arms in said erect condition, whereby a portion of fabric sheet (105) attached to said highest support arm (104A) is sloped to prevent water resting on top of said structure.

10. A portable structure according to any of claims 1 to 9, wherein said relative movement about said hinging means takes place about a substantially horizontal axis.

11. A portable structure according to any of claims 1 to 10, wherein said first and second parts of said mounting block are each configured to receive a lever (304, 305), which assist said relative movement about said hinging means.

12. A method of erecting a tent (102, 1102) [by] comprising the steps of:

spreading out a plurality of support arms (104, 1104) each having a first end pivotally attached to a mounting block (103) and a second end at-

tached to a sheet,
locating the second end of a plurality of the support arms on the ground when in an erected condition such that the mounting block is suspended at their first ends above the ground, and the support arms support said sheet, 5

characterised in that:

said mounting block comprises of two parts (301, 302, and 1201, 1202) connected by a hinging mechanism (303, 1221 and 1222) such that each of said two parts supports a plurality of said support arms; 10
said tent is erected by a relative movement of said two parts about said hinging mechanism; 15
and
said sheet (105) remains attached to said support arms when in said storage condition, when in said erect condition, and during erection. 20

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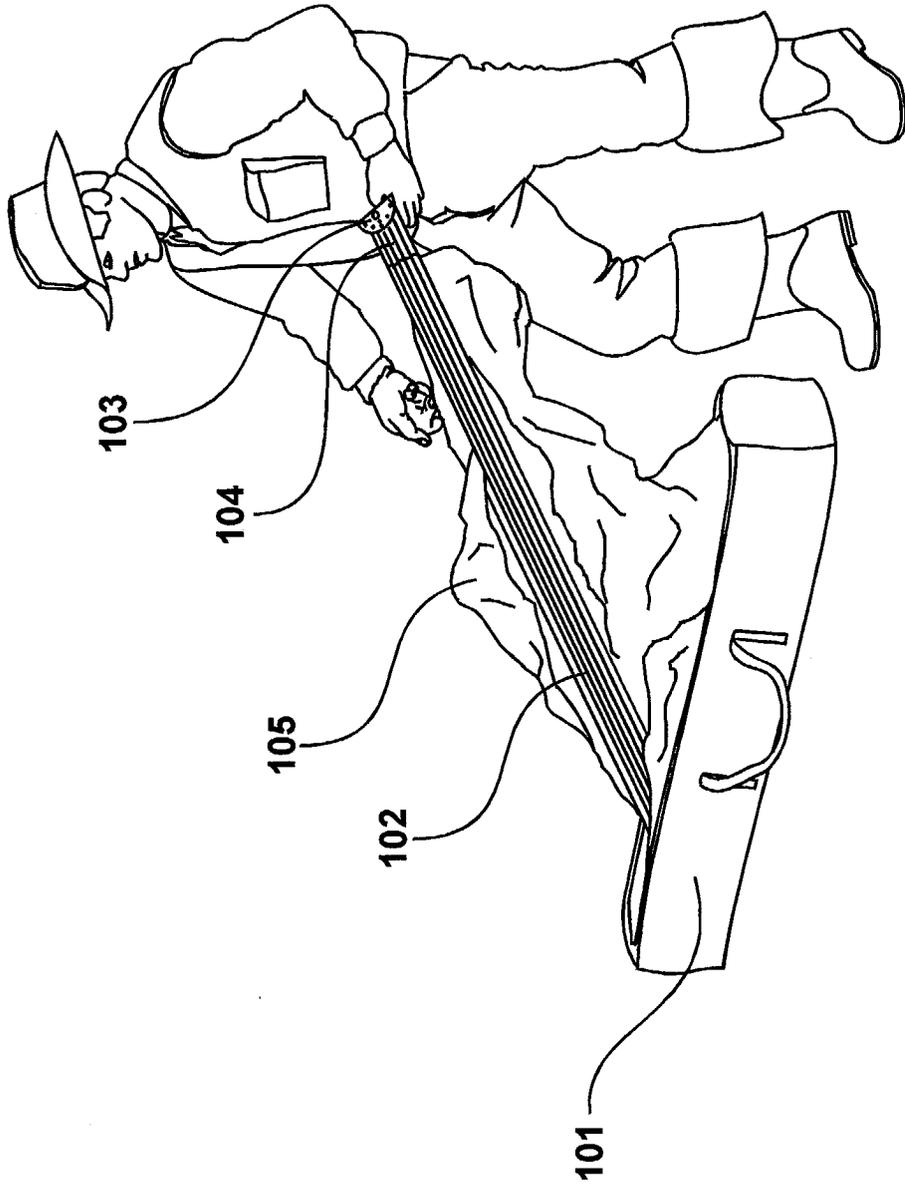


Figure 1

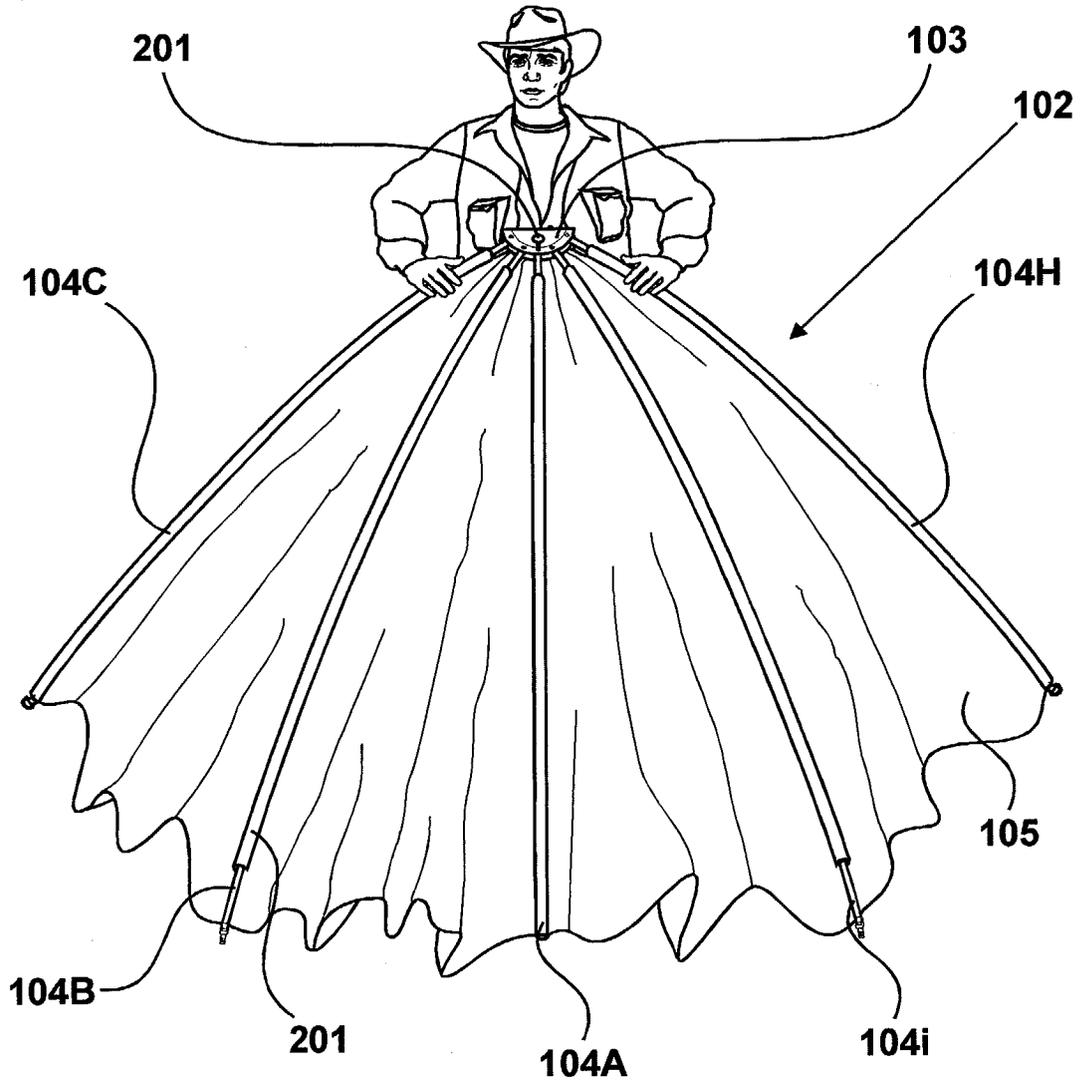


Figure 2

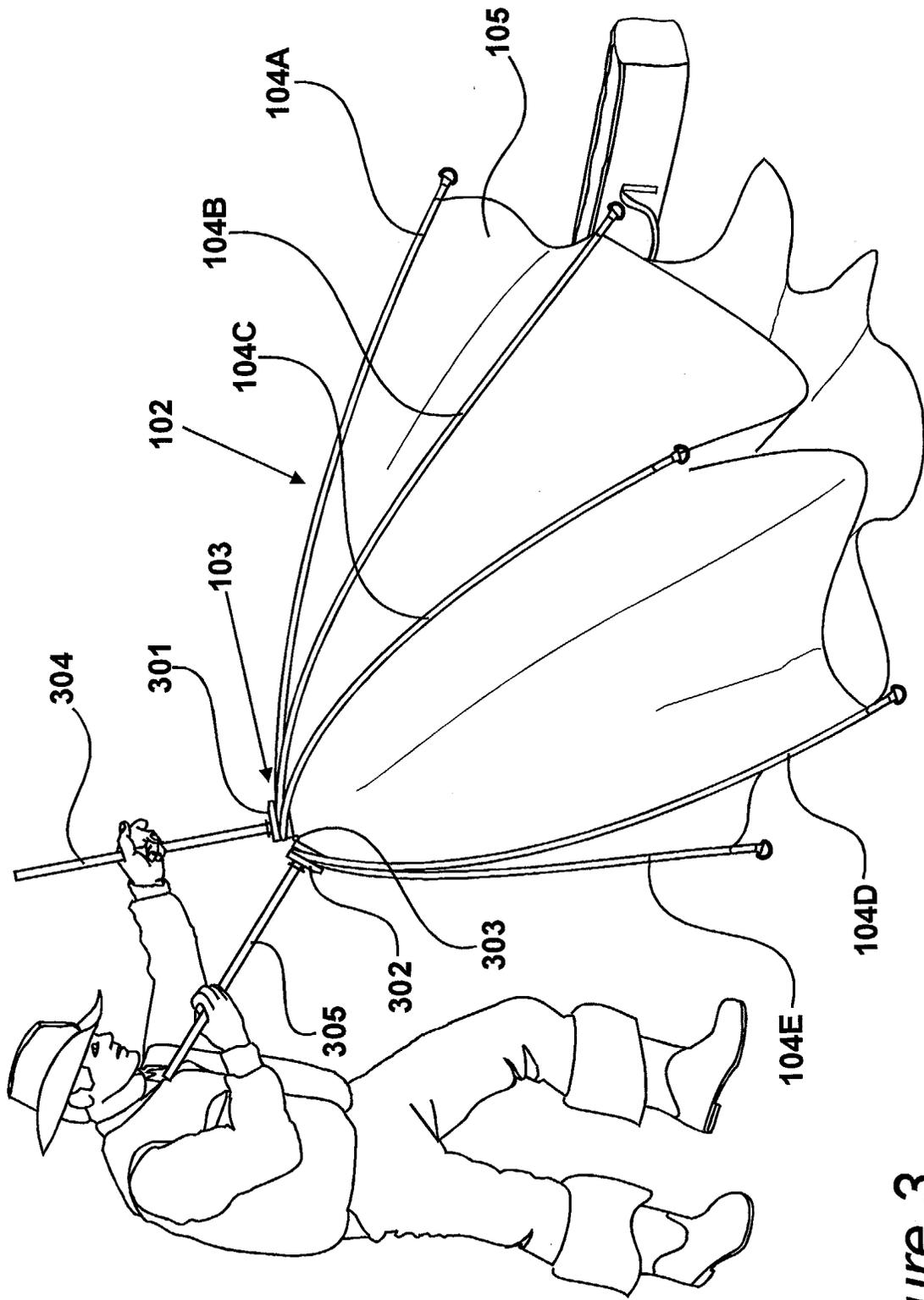


Figure 3

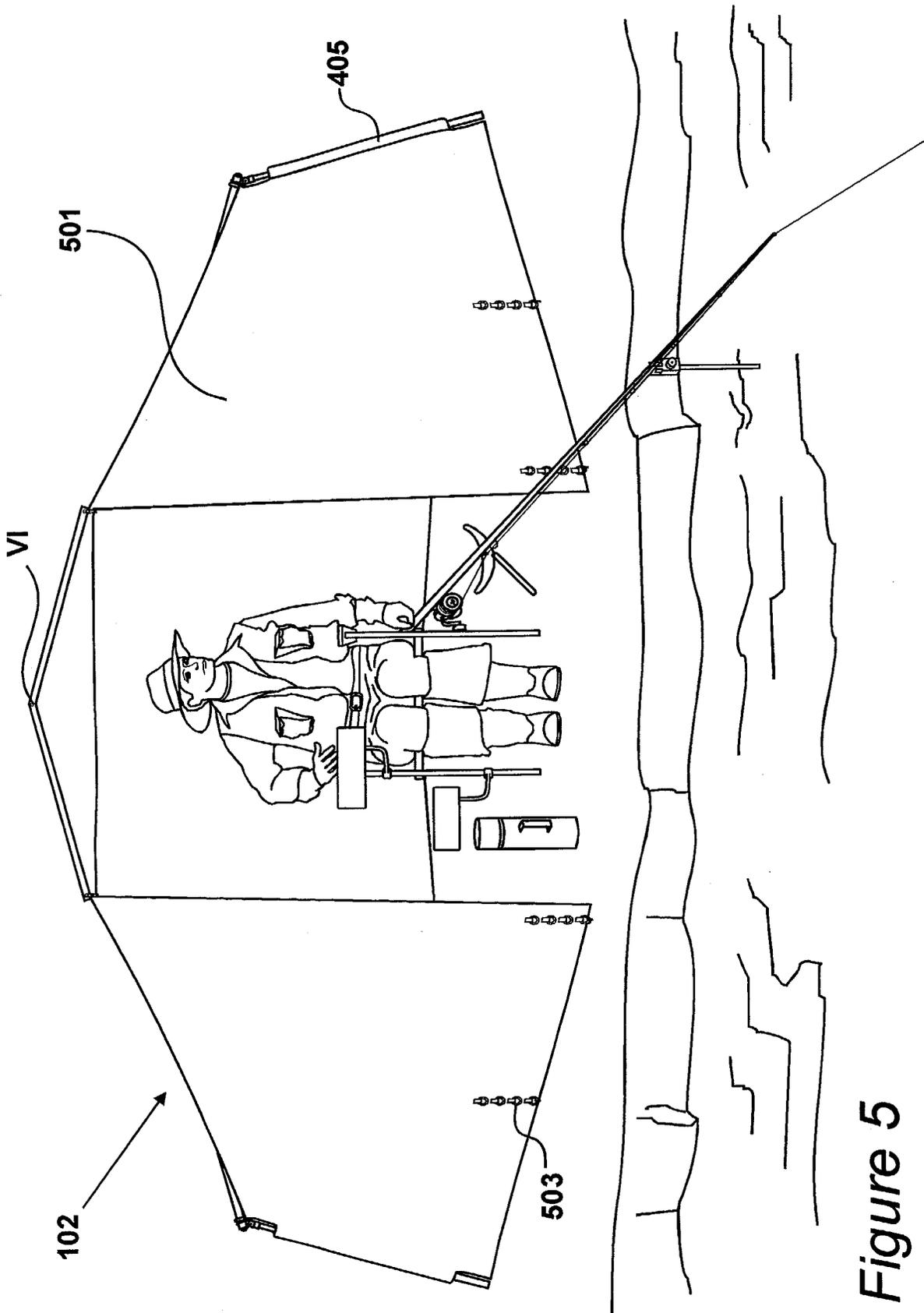


Figure 5

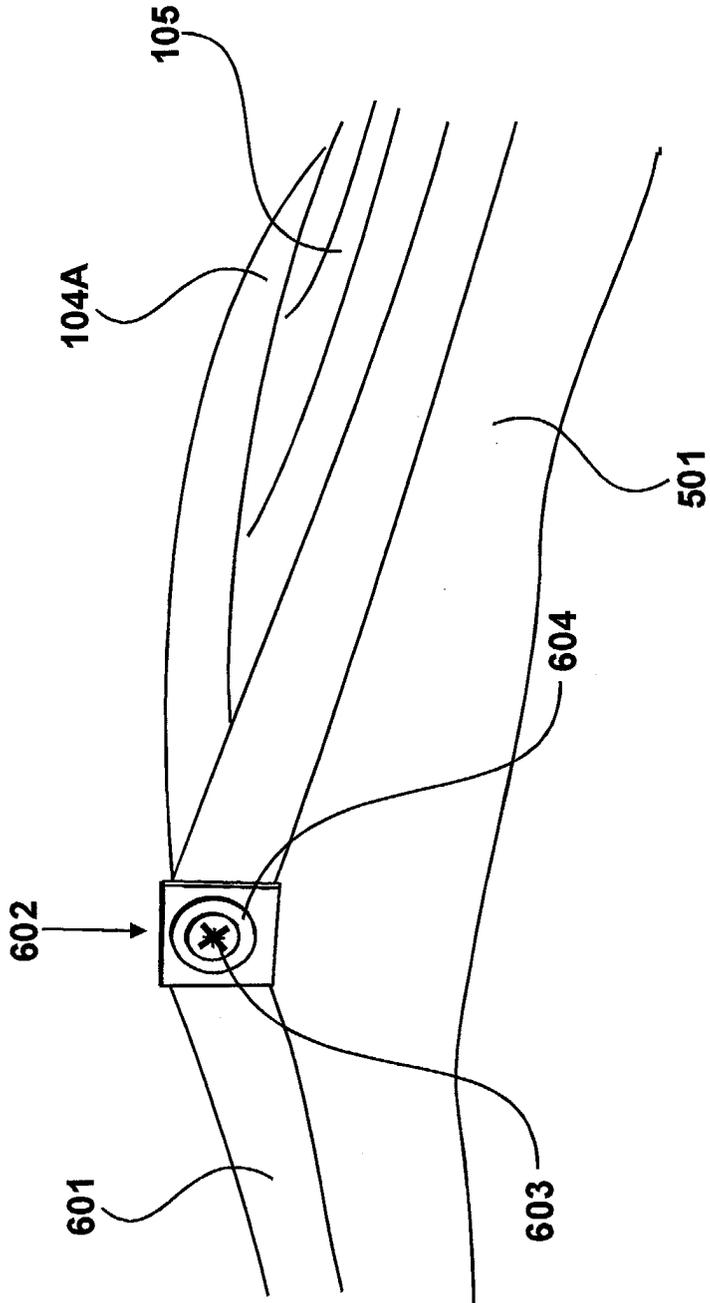


Figure 6

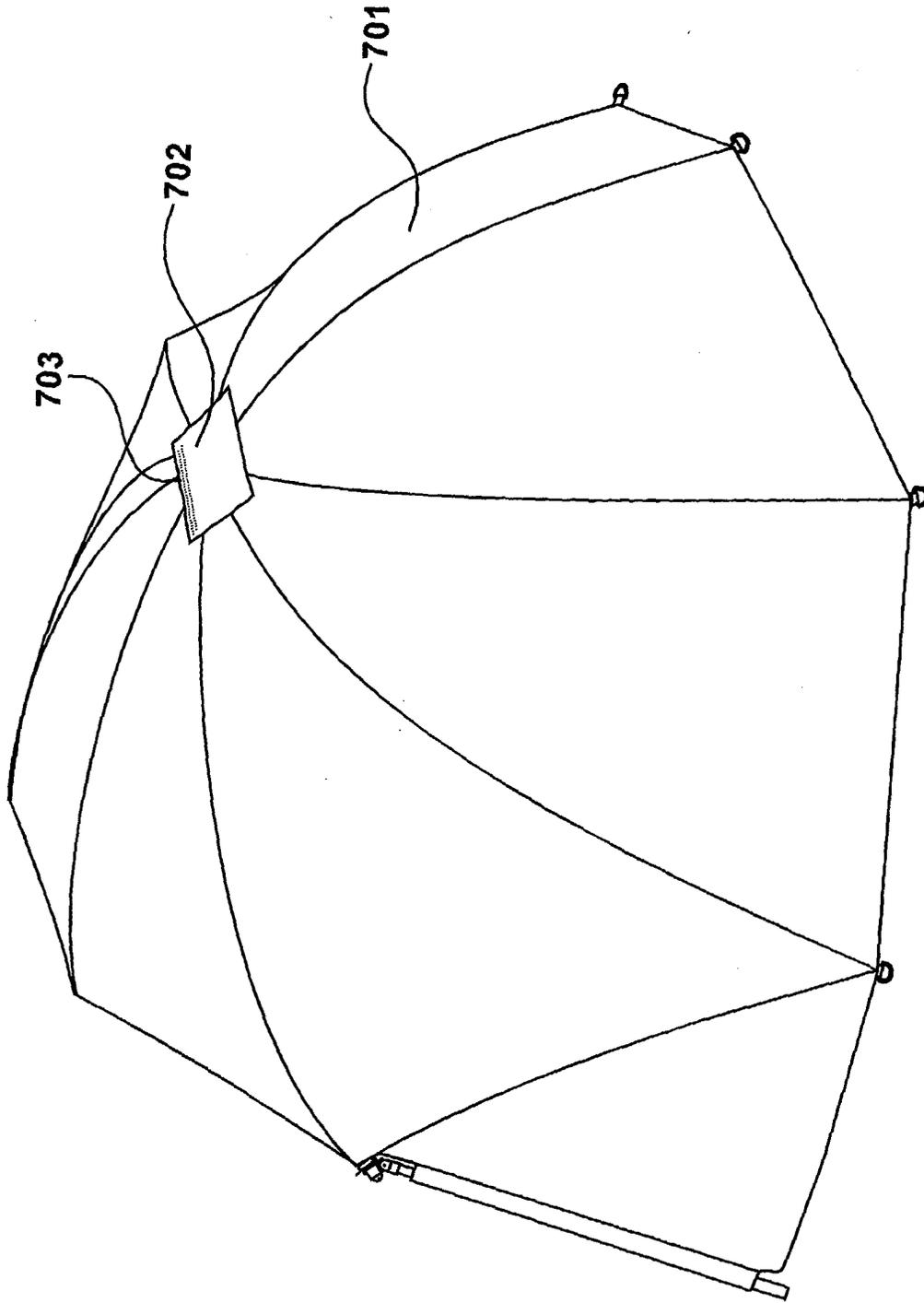


Figure 7

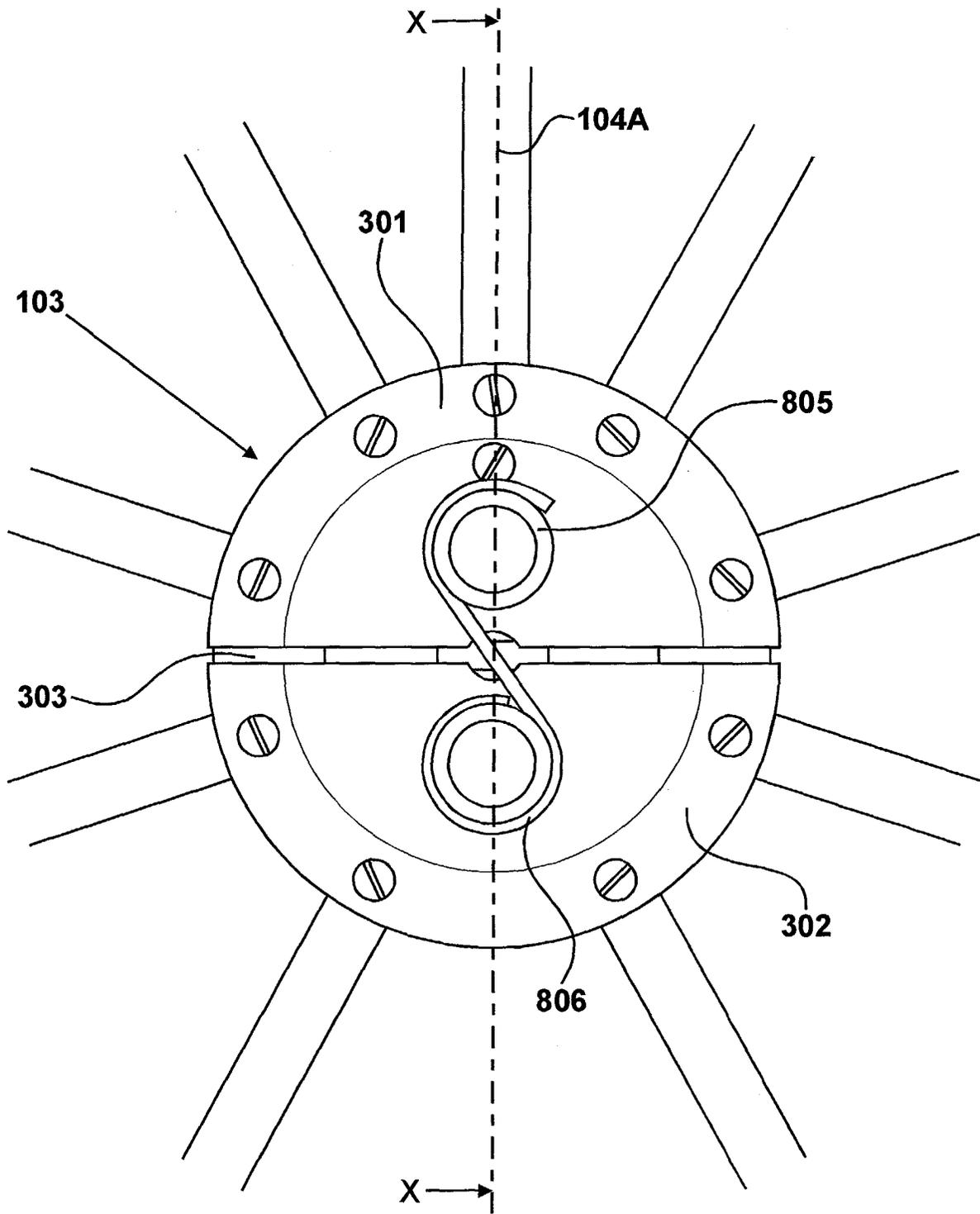


Figure 9

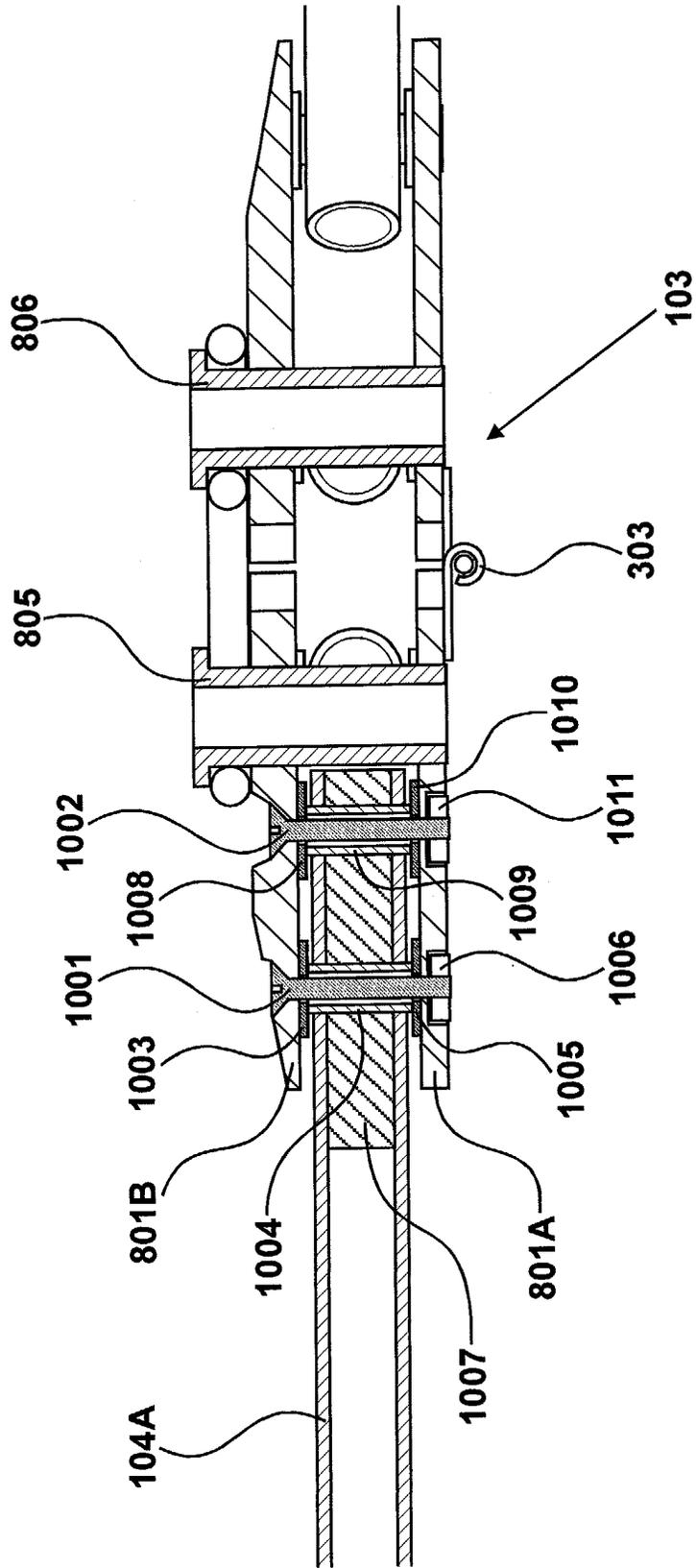


Figure 10

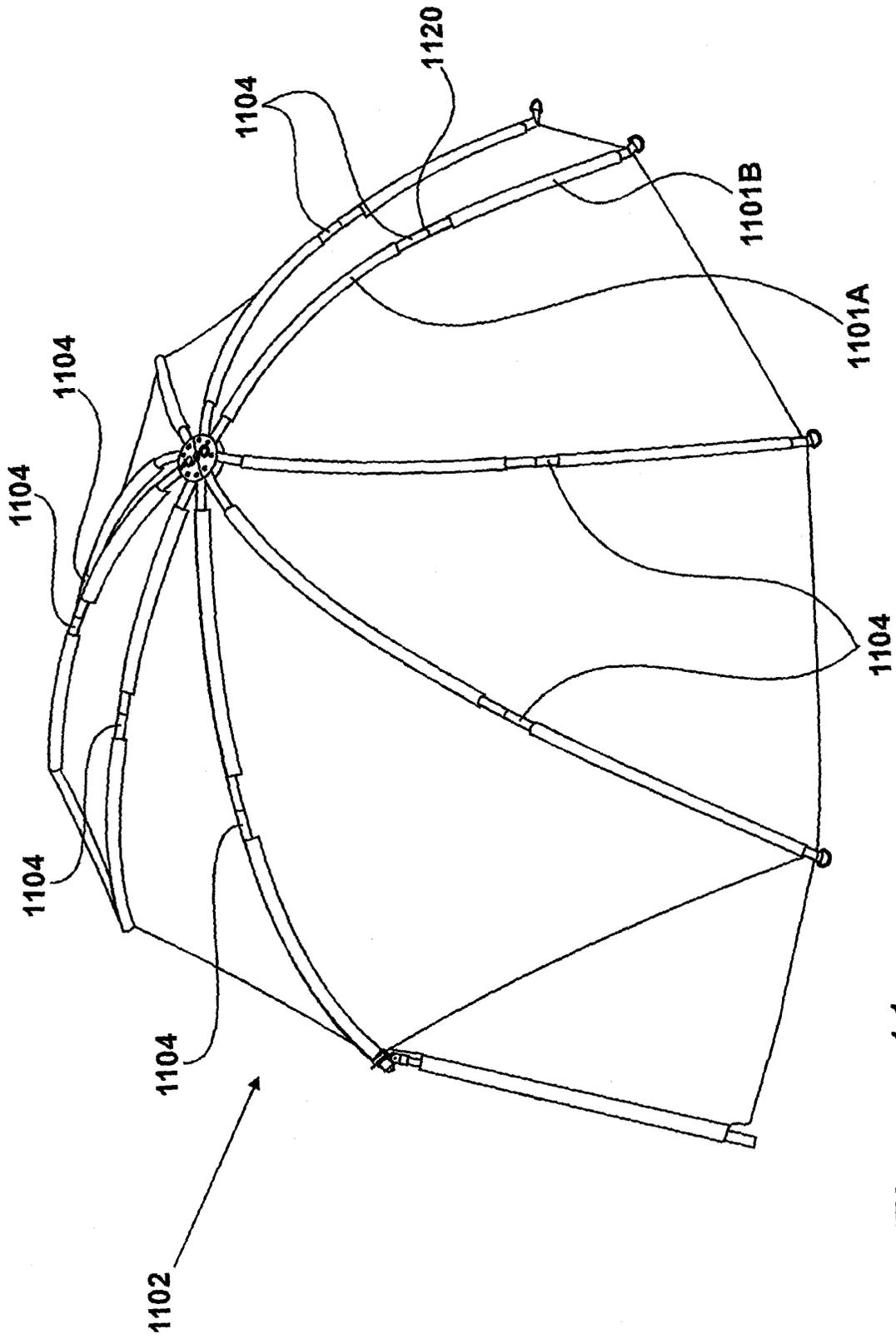


Figure 11

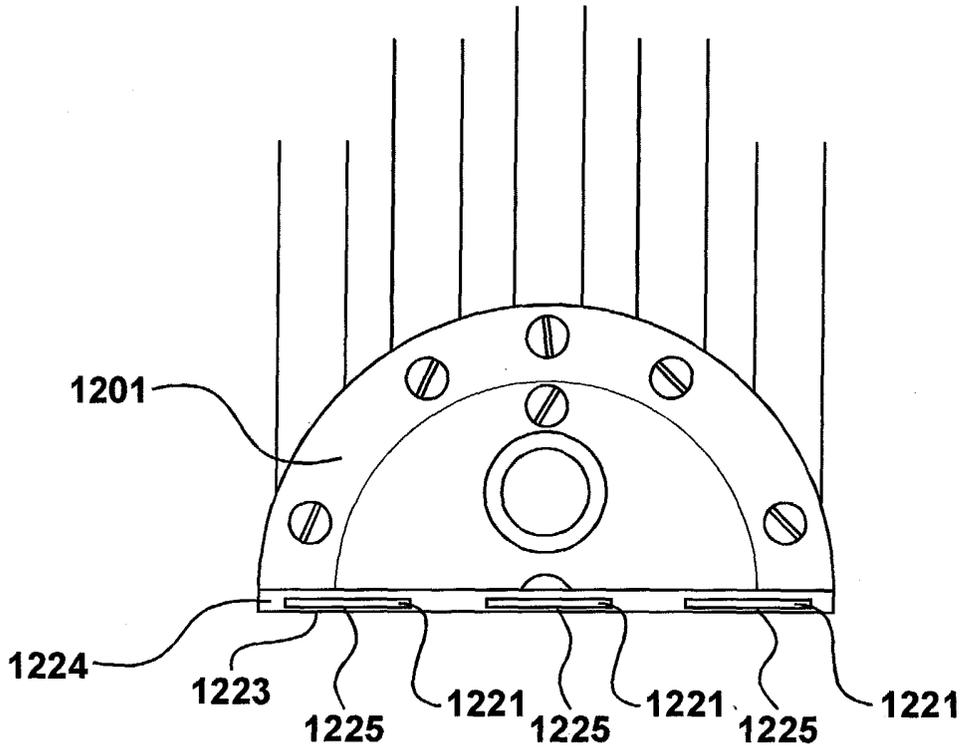


Figure 12A

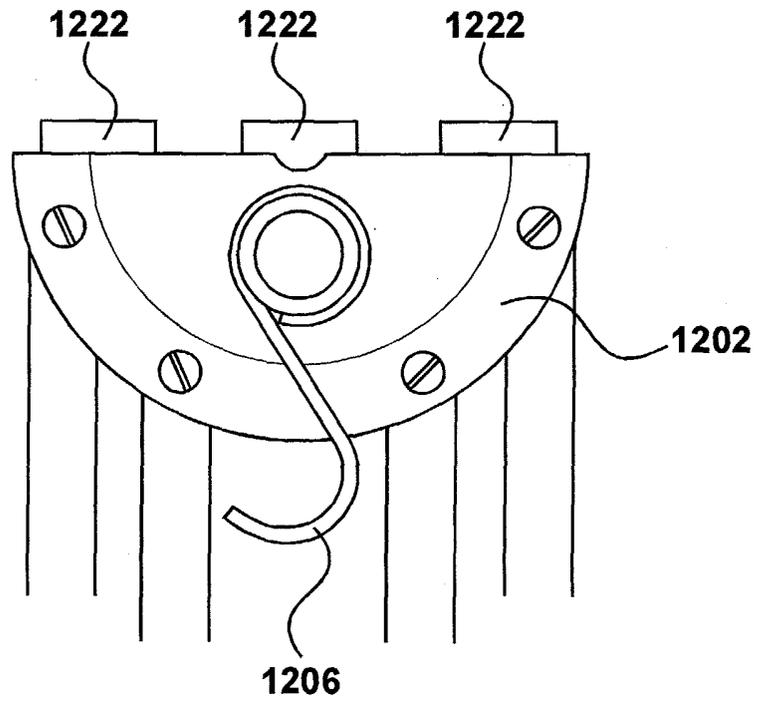


Figure 12B

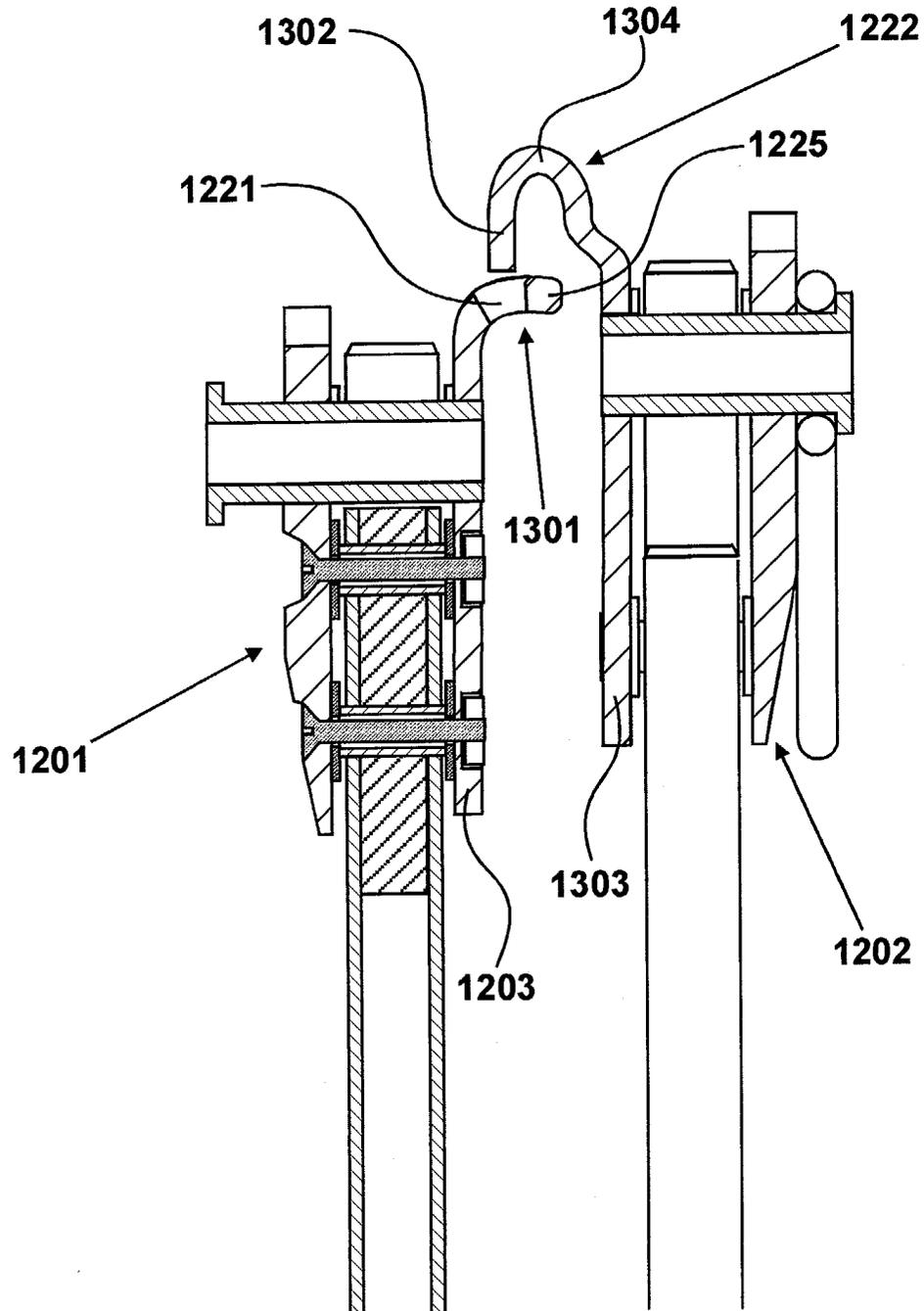


Figure 13

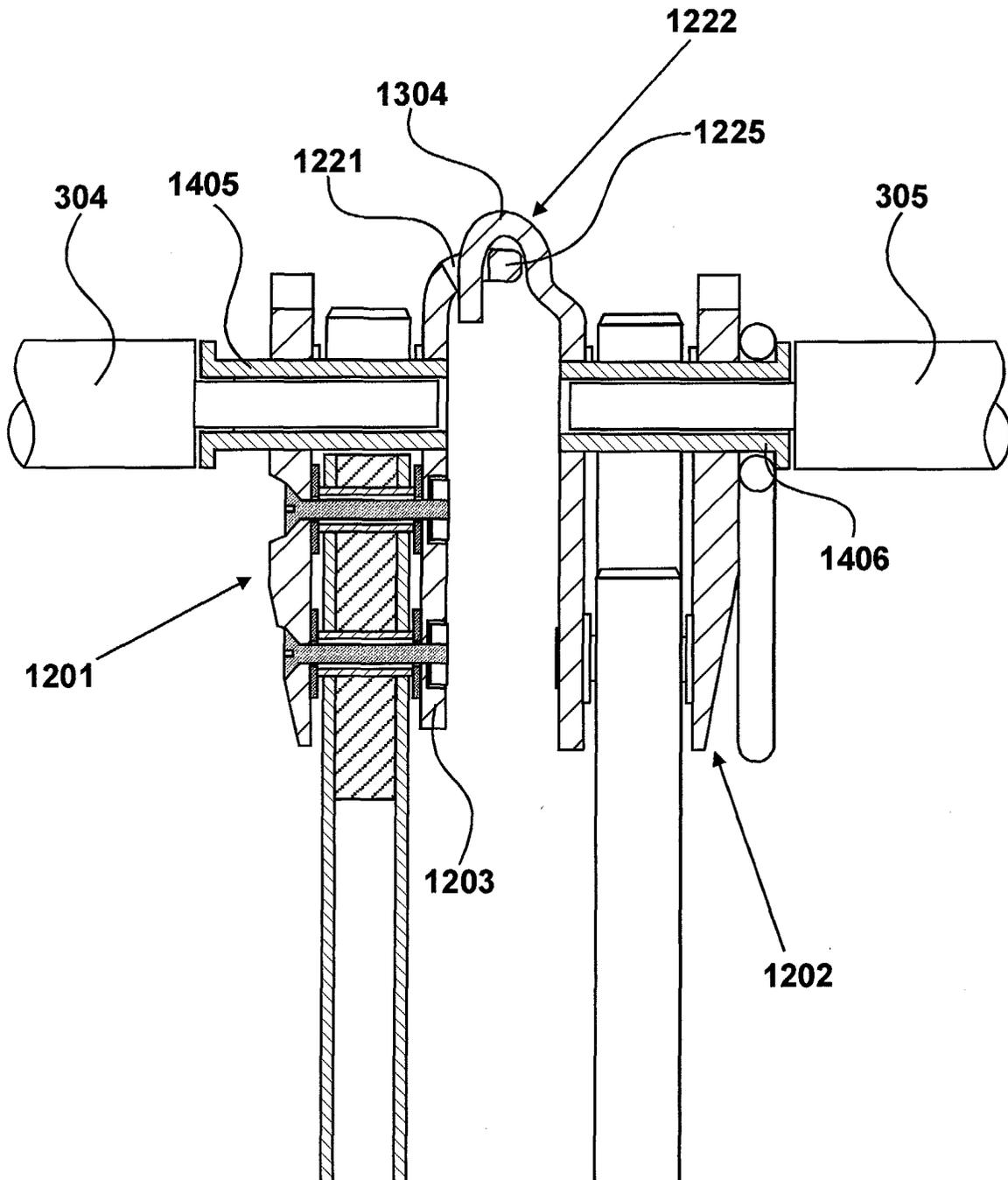


Figure 14

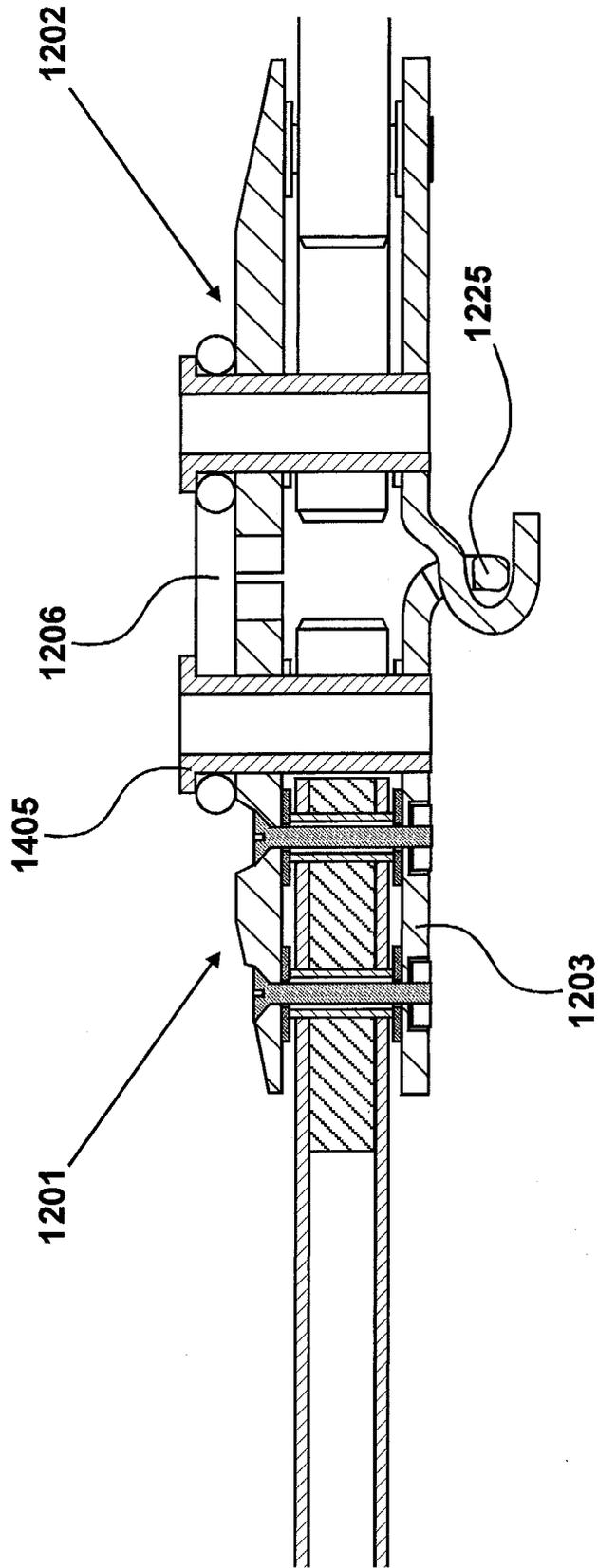


Figure 15



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Application Number
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