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(54) **PORTABLE STRUCTURE**

(57) A portable structure for providing temporary protection for at least one person from environmental conditions, the portable structure comprising:
a mounting block comprising:
a body having a first section and a second section configured to be pivotable relative to each other about a pivot axis to permit the erection and collapsing of the portable structure;
a plurality of support arms, each support arm having a first end secured to the mounting block and arranged to extend outwardly therefrom;
an erecting mechanism configured to apply a force to

move the first section and the second section of the body towards each other; and
a latching mechanism configured to releasably secure the first section of the body to the second section of the body in a latched position, the latching mechanism comprising a latching member coupled to the first section, and the latching mechanism being configured such that a movement of the latching member to effect latching and/or unlatching has a component of motion in a direction that is normal to a plane defined by the first ends of the support arms when the first section and second section are brought into alignment.

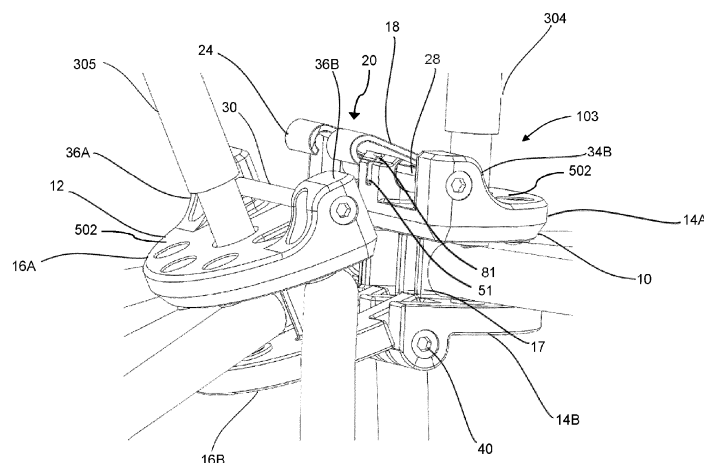


FIG. 8

Description

FIELD

[0001] The present teachings relate to a portable structure for providing temporary protection for at least one person from environmental conditions, the portable structure having a mounting block acting as a hub for support arms.

BACKGROUND

[0002] Portable shelters such as tents or umbrellas ("brollies") are often used in relation to outdoor sporting activities such as fishing to provide shelter from the weather. Currently available umbrellas often include a mounting block which supports the umbrella in an erect or open position, and the umbrella provides a shelter for a user. Umbrellas conventionally include a long centre supporting pole and arms which support a sheet to provide the shelter. In order to maintain the umbrella in the erected open position, a locking mechanism is deployed.

[0003] Portable structures for anglers are known and in many situations conflicting constraints exist in terms of portability, easy erection, strength and affordability. Portable structures have subsequently been developed that are formed from arms that extend radially from a central block or boss similar to an umbrella, but which are erected without the supporting pole, and look outwardly more similar to a tent.

[0004] 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. This may be particularly problematic when the portable structure is being erected in adverse weather conditions, where the angler may have, for example, limited visibility or limited mobility due cold conditions. In these conditions, the disadvantages associated with complex locking mechanisms with a plurality of parts are exacerbated.

[0005] Therefore, the present teachings seek to provide a way of alleviating at least some of the aforementioned issues.

SUMMARY

[0006] According to the present teachings there is provided a portable structure for providing temporary protection for at least one person from environmental conditions, the portable structure comprising: a mounting block comprising: a body having a first section and a second section configured to be pivotable relative to each other about a pivot axis to permit the erection and collapsing of the portable structure; a plurality of support arms, each support arm having a first end secured to the mounting block and arranged to extend outwardly therefrom; an erecting mechanism configured to apply a force to move the first section and the second section of the body towards each other; and a latching mechanism con-

figured to releasably secure the first section of the body to the second section of the body in a latched position, the latching mechanism comprising a latching member coupled to the first section, and the latching mechanism being configured such that a movement of the latching member to effect latching and/or unlatching has a component of motion in a direction that is normal to a plane defined by the first ends of the support arms when the first section and second section are brought into alignment.

[0007] Advantageously, this arrangement is simple to erect and pack away because latching and/or unlatching movements in this direction are convenient for the user, even in difficult conditions or whilst wearing gloves etc. The arrangement is also robust and secure.

[0008] The latching mechanism may further comprise a resilient element configured to apply a force to the latching member to release the latching member into the unlatched position or retain the latching member in the latched position. The resilient element may be a spring; for example a torsion spring or a compression spring.

[0009] Advantageously, using the resilient element to release the latching mechanism reduces the level of user intervention. Additionally, there may be a safety benefit as the user is less likely to trap their fingers.

[0010] The latching member and the resilient element may be arranged in such a way that when the latching mechanism is moved into the latched position, the resilient element generates a restoring force.

[0011] Advantageously, loading the resilient element in this way means that upon release of the latching mechanism, the latching mechanism is urged into the unlatched position without the need for user intervention.

[0012] The latching member may be pivotably mounted to the first section of the body.

[0013] Advantageously, this means that movement of the latching member between the latched and unlatched position retains/releases the first section in the required position. The latching member being pivotably attached enables a user to easily move the latch between the latched and unlatched positions.

[0014] The latching member may be arranged to pivot about an axis substantially parallel to the pivot axis of the first section relative to the second section.

[0015] Advantageously, this is a simple and secure means of mounting the latching mechanism to the body, and one which is simple for a user to operate with one hand, whilst the other hand manipulates the erecting mechanism to hold the first and second sections close to each other.

[0016] In the latched position the latching member may be releasably attached to a keeper located on the second section of the body.

[0017] Advantageously, this means the first and second sections can be latched and unlatched by the release of the latching member from the second support.

[0018] The keeper may be fixedly mounted to or integral with the second section of the body.

[0019] Advantageously this may simplify its construction and ensure correct alignment with the latching member to improve the ergonomics during erection.

[0020] The keeper may be a formation that extends substantially parallel to the pivot axis.

[0021] Advantageously, this arrangement is a simple way of securing the first and second sections of the body together in the erected position. Such an arrangement may also be robust, as it permits the load to be transmitted to a large contact area.

[0022] The latching member may comprise a hook or tooth for releasably attaching to or abutting the keeper in the latched position.

[0023] A clearance may be provided between the first section and the second section when in a latched condition.

[0024] This enables the first and second sections to be pivoted towards each other in order to unlatch the latching member and disassemble the portable structure.

[0025] The resilient element may be configured to bias the latching member in the unlatched position.

[0026] This enables rapid collapsing of the structure, by permitting a single operation to unlatch the block.

[0027] The latching member may comprise an elongate hook profile wherein the hook profile extends in a direction parallel to the pivot axis.

[0028] The first section may comprise a retention mechanism arranged to releasably retain the latching member against a surface of the first section in a storage position.

[0029] The retention mechanism helps to retain the latching member in the storage position when the portable structure is being stored. Advantageously, this inhibits the latching member from striking, and thus damaging, other components of the portable structure; during transportation for example.

[0030] The latching member may be formed at least partially from a metallic material, and the retention mechanism may include a magnetic element arranged to magnetically attract the latching member to the storage position.

[0031] The resilient member may urge the latching member into the storage position. This avoids the need for additional components to hold the latching member in this position.

[0032] The latching member may be rigidly attached to the first section.

[0033] Advantageously, this means the user does not have to move the latching member into the latched position; instead this is done by the pivoting of the first and second sections towards each other.

[0034] The latching member may be translatablely mounted to the first section.

[0035] The latching mechanism may comprise a release member actuable by a user to release the latching member.

[0036] The release member may be part of the latching member.

[0037] The erecting mechanism may comprise at least one erecting pole arranged to be releasably or permanently mounted to one of the first section and the second section.

5 **[0038]** Advantageously, the or each erecting pole is/are simple to manufacture and use, and can be provided at a length that prevents the user's hands from obstructing the view of the latching mechanism. Additionally, the erecting arms help to lever the structure into the erect position, and the length of the levers reduces the required force.

10 **[0039]** The first section may comprise a first mount for receiving the erecting mechanism and the second section may comprise a second mount for receiving the erecting mechanism.

15 **[0040]** The first section may comprise a first cavity, and the second section may comprise a second cavity for receiving the plurality of support arms.

20 **[0041]** Advantageously, the first cavity and the second cavity enable the securing of the supporting arms within the body.

[0042] The portable structure may further comprise a sheet attachable to the support arms.

25 **[0043]** Advantageously, the provision of a sheet protects the user from environmental conditions, for example wind and rain and provides an additional force on the body that further secures the latching mechanism in the latched position.

30 BRIEF DESCRIPTION OF THE DRAWINGS

[0044]

35 Figure 1 is a portable structure of the present teachings having a mounting block being used by an angler and depicted in a stowed condition;

40 Figure 2 is the portable structure of Figure 1 after a plurality of support arms have been radially extended;

45 Figure 3 illustrates the portable structure of Figure 1 being erected by an erecting mechanism;

Figure 4 shows the portable structure of Figure 1 in the erected position;

50 Figure 5 is a detailed isometric view of the mounting block of Figure 1 in a latched position;

Figure 6 is a plan view of the mounting block of Figure 1 in the latched position;

55 Figure 7 is a cross-sectional view of the mounting block of Figure 1 and the erecting mechanism in an unlatched storage position;

Figure 8 is a detailed isometric view of the mounting

block of Figure 1 in an unlatched position;

Figure 9 is a side view of the mounting block of Figure 1 being pivoted into the erected position by the erecting mechanism

Figure 10 is a side view of an alternative embodiment of a latching mechanism in the latched position;

Figure 11 is a side view of the latching mechanism of Figure 10 in an unlatched position;

Figure 12 is an isometric view of a mounting block including the latching mechanism of Figures 10 and 11; and

Figure 13 is a schematic cross-sectional view of a latching mechanism of a third embodiment of the present teachings.

DETAILED DESCRIPTION OF EMBODIMENT(S)

[0045] A portable structure 102, being used by an angler, is illustrated in Figure 1. The structure is typically stored between uses in a storage bag 101. The portable structure 102 provides a robust shelter under extreme environmental conditions, and additionally may provide sufficient space for a bed. Furthermore, it may be necessary to assemble the structure in less than ideal conditions. Therefore, the assembly procedure aims to be relatively straightforward while at the same time, the structure is robust and resilient to extreme weather.

[0046] It shall be appreciated that the term "erected" refers to the portable structure when it has been assembled by the angler and is ready for use, and the term "disassembled" refers to the portable structure when it not in a state for use by the angler.

[0047] The portable structure 102 comprises a mounting block 103, a plurality of support arms 104, and a waterproof fabric sheet 105 attached to said support arms 104. In the storage condition shown in Figure 1, the support arms 104A-I are folded away such that they are substantially parallel to each other.

[0048] The portable structure 102 is shown in Figure 2 after the support arms 104 have been spread out. The portable structure 102 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.

[0049] An erecting mechanism 304, 305 illustrated in Figure 3, is inserted into the mounting block 103 to erect the portable structure 102. The portable structure 102 is shown in its fully erect condition in Figure 4. Four of the support arms 104D to 104G extend generally downwards

and are pegged to the 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 similarly be secured to front support arms 104I and 104B as required by the environmental conditions.

[0050] The support arms 104A to 104I define a dome shape and the fabric sheet 105 is suspended from said arms 104A to 104I, such that the sheet is located internally with respect to said arms 104A to 104I. However in an alternative embodiment, the sheet 105 is attached such that it lies external to the support arms 104A-I. A flap is provided within the sheet 105 to allow access to the mounting block 103 for the purposes of erecting and collapsing the structure 102. A portion of the sheet 105 extends away from the support arms 104 and downwards to provide a front wall for the structure 102. An opening in the wall provides an entrance to the structure.

[0051] 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 102 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.

[0052] When the structure is in the erect condition, 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.

[0053] The end of the support arm 104A is attached to sheet 105 by an upturned edge portion secured to the end of support arm 104A by means of a screw and a washer. 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. allow the sheet to be removed for repair or replacement as and when this becomes necessary.

[0054] The upturned edge is attached to the adjacent support arms 104B and 104I in a similar manner, so that rain water running off the sheet 105 is directed away from the entrance.

[0055] In the main embodiment, as shown in Figure 4, each of the support arms 104A-I consists of a single length of aluminium tubing which extends from the mounting block 103 to a fabric sheet attachment device. The support arms are pre-formed to provide the required dome-shape of the structure.

[0056] Alternatively, the support arms may be 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.

[0057] Although not illustrated, the portable structure 102 may further comprise a second fabric sheet secured to the ends of the support arms 104A-I such that it lies to the outside of said support arms 104A-I. Therefore, the second sheet lies substantially in parallel with the first fabric sheet 105 which lies under the support arms 104A-I. In this way, the portable structure 102 is provided with a double skin which, when required for relatively long durations, such as for overnight use, significantly reduces problems associated with condensation.

[0058] The second fabric sheet may be arranged to extend radially outward of the sheet 105, the outwardly extending portion of the second sheet acting as a peak to inhibit rainwater entering the portable structure 102. For example, a portion of the second sheet may extend radially outward of the sheet 105 between any two of support arms 104H, 10I, 104A, 104B and 104C in order to inhibit rainwater from entering the open side of the portable structure 102 shown in Figure 4.

[0059] A detailed isometric view of the mounting block 103 is shown in Figure 5. The mounting block 103 comprises a body with a first section 10 and a second section 12, a latching mechanism 20 and a first and second hole 26A, 26B located in a top surface 502 of the first and second sections 10, 12. A hinge 40 pivotably connects the first and second sections 10, 12 about a pivot axis A-A.

[0060] Each of the first and second sections 10, 12 of the mounting block 103, comprise a pair of top and bottom plates 14A, 14B, and 16A, 16B respectively. In this embodiment, the four plates 14A, 14B, 16A, 16B are substantially planar and semi-circular in plan view. The top plate 14A and the bottom plate 14B of the first section are parallel, and the bottom plate 16B and the top plate 16A of the second section are parallel.

[0061] The first section 10 is integrally formed and the second section 12 is integrally formed in a moulding from a fibre reinforced plastics material - e.g. using glass fibre or carbon fibre reinforcing. In alternative embodiments the first and second section 10, 12 may be manufactured from any suitable metal or metal alloy, e.g. an aluminium alloy.

[0062] The top plates 14A, 16A are connected to the respective bottom plates 14B, 16B by integral webs 17 which extend in a direction perpendicular to the planar surfaces of the top and bottom plates 14A, 16A, 14B, 16B. It shall be appreciated that in alternative embodiment each plate could be manufactured separately and joined together. When the first and second sections 10, 12 of the body are in the erected position, the top plate 14A of the first section 10 and the top plate 16A of the second section 12 are in this embodiment slightly oblique - i.e. not parallel. Instead, an obtuse angle is formed between the two top plates 14A, 16A about the pivot axis A-A in the range 170°-180°. In other embodiments the top plates 14A and 16A are substantially parallel.

[0063] The first and second sections 10, 12 each comprise a cavity 501 between the top plate 14A, 16A and the bottom plate 14B, 16B, as illustrated in Figure 5, for receiving an end of the plurality of support arms 104A-I. In this embodiment, five of the support arms 104A, 104B, 104C, 104H, 104I are sandwiched between the bottom plate 16B and the top plate 16A of the second section 12, while the other four support arms 104D, 104E, 104F, 104G are sandwiched between the bottom plate 14B and the top plate 14A of the first section 10.

[0064] The support arms 104B-I are pivotably secured to the first and second sections 10, 12 by a plurality of pivot mechanisms 48B-I, illustrated in Figure 6. The first section 10 comprises four circumferential holes for receiving the pivot mechanisms 48D-G, and the second section comprises four circumferential holes for receiving pivot mechanisms 48B-C, 48H-I. In this embodiment, the pivot mechanisms 48B-I are a single bolt extending through the holes in the first and second sections 10, 12 and into through holes located the ends of the support arms 104B-I. This enables the support arms 104B-I to pivot about the bolts 48B-I.

[0065] However, if all of the support arms 104A-I were pivotally attached to the mounting block 103, inward forces from said arms would tend to rotate the mounting block 103 such that the support arms 104A-I are no longer arranged in a truly radial manner. For this reason, the support arm 104A is rigidly attached to the first and second sections 10, 12 by a bolt 48A, so that it cannot pivot. Consequently, when the structure 102 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 103.

[0066] The axis A-A of the hinge 40 is perpendicular to the direction of the support arm 104A. This configuration has been found preferable to facilitate the erection of the structure 102, because it allows the support arms 104A-I to be spread out in a substantially horizontal plane P, as shown in Figures 4 and 5, with the rear arms 104E and 104F lowermost.

[0067] In this embodiment, the hinge 40 comprises a pin extending through holes in the bottom plates 14B, 16B of the first section 10 and the second section 12, as illustrated in the cross-sectional view of Figure 7. The bottom plates 14B, 16B comprise a plurality of interdigitating protrusions and notches located on the straight sides of the semi-circular profile of the bottom plates 14B, 16B. The protrusions and notches fit together in such a way that a notch on the bottom plate 14B receives a protrusion on the bottom plate 16B and vice versa. The pin extends through the interlocking protrusions of the bottom plates 14B, 16B to create an even force distribution across the pin as the first and second sections 10, 12 pivot.

[0068] The mounting block 103 includes first and second holes 26A, 26B that are configured to receive the erecting mechanism 304, 305. This establishes a connection between the erecting mechanism 304, 305 and

the mounting block 103 to facilitate the erection of the structure 102. The holes 26A, 26B of this embodiment are circular to conform to the shape of the erecting mechanism, however in alternative embodiments the holes may be any suitable shape.

[0069] In this embodiment, the erecting mechanism comprises levers in the form of a separate first and second rod 304, 305 for engagement with the hole 26A of the first section 10 and a hole 26B of the second section 12, as illustrated in Figure 5. The first and second rods 304, 305 of this embodiment are removable. In alternative embodiments the levers may be permanently attached to the mounting block 103, or alternative arrangements that have different configurations known in the art, for example a single rod operating in conjunction with one of the support arms to provide leverage.

[0070] It shall be appreciated that "latched position" refers to the position of components of the latching mechanism 20 when the first and second sections 10, 12 of the mounting block 103 are retained in the erect position (see Figures 5 and 6). It shall be appreciated that "unlatched position" refers to the position of the components of the latching mechanism 20 when the first and second sections 10, 12 are free to pivot relative to each other and the mounting block 103 is in the disassembled state (see Figures 7 to 9).

[0071] With reference to Figures 5 to 8, the latching mechanism 20 of the mounting block 103 is configured to releasably secure the first section 10 and the second section 12 in the latched position, and therefore facilitate erection of the portable structure 102. The latching mechanism 20 comprises a latching member 18, a resilient element 38 and a first and a second support 28, 30.

[0072] The latching member 18 pivots between the latched position and the unlatched position, and the resilient element 38 biases, in this embodiment, the latching member towards the unlatched position. The first support 28 is located on the first section 10, and permanently attaches the latching member 18 to the first section 10. The second support 30 is located on the second section 12 and engages with the latching member 18 in the latched position - i.e. acts as a form of keeper or striker.

[0073] The line of action of the centre of masses of the first and second sections 10, 12 are located on opposing sides of the pivot axis A-A. This means that tension generated in the sheet 105 and transmitted through the support arms 104A-I as the portable structure is erected and/or gravity acts on the first and second sections 10, 12, they will tend to pivot away from each other.

[0074] The latching mechanism 20 provides the reaction force to retain and prevent the first and second sections 10, 12 from pivoting away from each other. The gravitational force acting on the first and second sections 10, 12, as well as the force exerted on the first and second sections 10, 12 by the tensioned sheet 105, securely retain the latching mechanism 20 in the latched position and prevent the resilient element 38 from moving the latching member 18 towards the unlatched position.

[0075] In the embodiment of Figures 1 to 9, the first support 28 is located on the top surface 502 of the first section 10, and the second support 30 located on the top surface 502 of the second section 12. The latching member 18 is pivotally attached to the first support 28 proximate one edge of the first section 10, and releasably attached to the second support 30 at an opposing edge of the second section 12.

[0076] In this embodiment, the first support is a first shaft 28 that extends substantially parallel to the pivot axis A-A of the first and second sections 10, 12. The latching member 18 is mounted to the first shaft 28 so as to pivot about the first shaft 28 to rotate from the unlatched position to the latched position, and vice versa.

[0077] In this embodiment the first shaft 28 is a separate component fixed at a first end to a first mount 34A on the top plate 14A, and at an opposing end to a second mount 34B on the top plate 14A.

[0078] In the embodiment illustrated in Figures 5-9, the resilient element 38 of the latching mechanism 20 is a torsion spring 38. As illustrated in Figure 7, the torsion spring 38 is mounted such the spring coil encircles the first shaft 28, a first leg is grounded on the top plate 14A and a second leg 81 is arranged to act on the latching member 18 (see Figure 8).

[0079] The torsion spring 38 is coupled to the latching member 18 in such a way that when the latching member 18 is in the latched position, the torsion spring 38 deforms from its relaxed state such that a preload torque is applied to the torsion spring 38. The torsion spring 38 biases the latching member 18 into the unlatched position when there are no external forces acting on the latching member 18 which restrict movement of the latching member 18. The torsion spring 38 is located within a slot 51 of a central support 50. The central support 50 is arranged to support a central portion of the first shaft 28.

[0080] In the unlatched position, with no external forces restricting its movement, the latching member 18 can be pivoted away from the second support 30 such that it abuts the top surface 502 of the first section 10, as shown in Figure 7. The latching member 18 is in the "unlatched storage position" when it abuts the top surface 502 of the first section 10.

[0081] The first section 10 includes a retention mechanism arranged to retain the latching member 18 in the unlatched storage position. In the illustrated embodiment, the retention mechanism includes a magnetic element 71, which is located beneath the top surface 502 of the first section 10 and adjacent the latching member 18 when it is in the unlatched storage position. In the illustrated embodiment, the latching member 18 is formed from a metallic material and is therefore magnetically attracted to the magnetic element 71. The magnetic force acting on the latching member 18 in the direction towards the magnetic element 71 helps to retain the latching member 18 in the unlatched storage position. The magnetic field strength of the magnetic element 71 is chosen such that a user can separate the latching mem-

ber 18 from the top surface 502 of the first section 10 using little physical effort.

[0082] In alternative embodiments (not shown), the magnetic element 71 may instead be mounted to the top surface 502 of the first section 10.

[0083] In alternative embodiments (not shown), the first section 10 may include any suitable retention mechanism for retaining the latching member 18 in the unlatched storage position.

[0084] For example, in such alternative embodiments (not shown), the retention mechanism could include Velcro. A strip of fabric including hooks may be mounted to the top surface 502 of the first section 10 and a strip of fabric including loops may be mounted to a surface of the latching member 18 facing the top surface 502 in the unlatched storage position. When the latching member 18 is placed in the unlatched storage position, the hooks and the loops releasably engage such that the latching member 18 is releasably retained in the unlatched storage position. The mounting locations of the strip of fabric including loops and the strip of fabric including hooks may be swapped.

[0085] As a further example, in such alternative embodiments (not shown), the retention mechanism could include the torsion spring 38. The torsion spring 38 could be configured such that it biases the latching member 18 into the unlatched storage position.

[0086] The central support 50 restrains the torsion spring 38 from moving axially along the first shaft 28, and blocks the torsion spring 38 from fully relaxing, due to an edge of the slot 51 blocking this movement. This limits the angle over which the latching member 18 is biased.

[0087] The second support 30 is a second shaft 30 that extends substantially parallel to the pivot axis A-A of the first and second sections 10, 12, and which is configured to act as a keeper or striker. An end portion 24 of the latching member 18 is configured to be engageable with the second shaft 30 such that in the latched position, the latching member 18 and the second shaft 30 are in engagement. In the unlatched position, the latching member 18 and the second shaft 30 are detached from each other; i.e. disengaged. The second shaft 30 is fixed at a first end to a first mount 36A on the top plate 16A, and at an opposing end to a second mount 36B on the top plate 16A.

[0088] The mounts 34A, 34B, 36A, 36B are integrally formed with the first and second sections 10, 12 respectively.

[0089] In the latched position, the first and second shafts 28, 30 are located substantially equidistant to the pivot axis A-A. The shafts 28, 30 are threaded into bores of the respective first and second mounts 34A, 34B, 36A, 36B of the first and second sections 10, 12. The shafts 28, 30 are offset vertically from the top surfaces 502 of the first and second sections 10, 12 respectively. This enables a space below the second shaft 30 in which the end portion 24 of the latching member 18 is at least partially received in the latched position.

[0090] In the embodiment illustrated in Figures 5-9, the latching member 18 comprises an elongate hook profile, wherein the profile extends along an axis parallel to the pivot axis A-A. As such, the edge portion 24 has a hook-shaped cross-section. The elongate hook profile increases the contact area between the second shaft 30 and the latching member 18 and therefore creates a more secure latch as well as distributed the force on the latching member 18.

[0091] In this embodiment the latching member 18 has a width that is around 50% the diameter of the first and second sections 10, 12. This provides a large contact area for the user to interact with when operating the latch, enhancing the ergonomics thereof. In other embodiments the width may be at least 20%, e.g. at least 30%, up to 100% of the diameter.

[0092] The hooked edge portion 24 is configured to hook around the second shaft 30 in the latched position. The radius of the hooked edge portion 24 is greater than the radius of the second shaft 30, enabling the latching member 18 to hook around the circumferential surface of the second shaft 30. In addition, the hooked edge portion 24 is configured to extend circumferentially through approximately 180°, as illustrated in Figures 8 and 9. This helps to ensure the latching member 18 is securely engaged with the second shaft 30 in the latched position, and inhibits the latching member 18 from pivoting into the unlatched position while the portable structure 102 is in use.

[0093] The hooked edge portion 24 comprises a notch 49 located at its centre. The notch 49 has a greater cross-sectional area than the cross-sectional area of the portions of the first and second rods 304, 305 proximate the holes 26A, 26B. The notch 49 is generally semi-circular to correspond with the circular cross-section of the rods 304, 305. As such, the notch 49 creates a passage for the rod 304 to extend through during assembly of the structure 102. However, it shall be appreciated that in alternative embodiments (not shown), the notch 49 may be any suitable shape which can accommodate the cross sectional profile of the rod 304, or it may be omitted entirely.

[0094] The notch 49 is shaped to ensure that the first rod 304 is able to be inserted through the notch 49 when the latching member 18 is in the unlatched position in a face contacting relationship with the top plate 14A, as shown in Figure 7. This inhibits the latching member 18 from obstructing the rod 304 throughout the erecting process.

[0095] To assemble the portable structure 102, the structure 102 is firstly removed from the storage bag 101, and the structure 102 is laid out such that the support arms 104A-I are moved circumferentially so as to spread them out.

[0096] The user inserts the rods 304, 305 into the first and second holes 26A, 26B. The length of the rods 304, 305 provides the user with sufficient leverage when the rods 304, 305 are forced towards each other to rotate

the first section 10 and the second section 12 towards each other. As the two rods 304, 305 are brought together, the relative movement of the two sections 10, 12 of the mounting block 103 and the consequent movement of the support arms 104A-I causes the sheet 105 to become tensioned and the support arms 104A-I to extend radially from said mounting block 103.

[0097] Whilst maintaining the force exerted on the rods 304, 305, the user rotates the latching member 18 about the first shaft 28 from the unlatched to the latched position such that the hooked edge portion 24 hooks around and engages the second shaft 30. Rotation of the latching member 18 about the first shaft 28 compresses the torsion spring 38. The engagement of the hooked edge portion 24 with the second shaft 30 secures the mounting block 103 in the erected position. The tendency of the first and second sections 10, 12 to pivot away from each other by virtue of the tensile force generated by the sheet 105 allows a secure latching between the first and second section 10, 12 to be achieved without additional securing measures.

[0098] Once the latching member 18 is in the latched position, the first and second rods 304, 305 are removed from the first and second holes 26A, 26B and stored in the storage bag 101. The portable structure 102 is erected and suitable for use by the user.

[0099] In order to disassemble the portable structure 102, the user firstly inserts the first and second rods 304, 305 into the first and second holes 26A, 26B. The top surface 502 of the first section 10 and the top surface 502 of the second section 12 are not quite parallel, as discussed above, which means that there is a gap between the top plates 14A, 16A. The two rods 304, 305 pivot the first and second sections 10, 12 towards each other in such a way that the gap decreases. This permits the hooked edge portion 24 to disengage the second shaft 30. As the torsion spring 38 is tensioned in the latched position, upon release of the latching member from the second shaft 30, the torsion spring 38 exerts a force on the latching member 18 as the torsion spring 38 relaxes. The force exerted on the latching member 18 by the torsion spring 38 acts to pivot the latching member 18 into the unlatched position in the direction U shown in Figure 9.

[0100] In the illustrated embodiment, the torsion spring 38 and the latching member 18 are not connected. As shown in Figure 8, the latching member 18 abuts the second leg 81 of the torsion spring 38 when the latching member 18 is pivoted away from the unlatched storage position towards the second support 30. When the latching member 18 and the second leg 81 abut, pivoting of the latching member 18 towards the second support 30 rotates the second leg 81 about the first support 28, which generates tension in the torsion spring 38. Upon release of the latching member 18 from the second shaft 30 (i.e. from the latched position), the second leg of the torsion spring 38 pushes against the latching member 18 causing the latching member 18 to pivot away from the

second support 30 into the unlatched position.

[0101] As discussed above, the central support 50 blocks the torsion spring 38 from fully relaxing, due to an edge of the slot 51 blocking this movement. Therefore, upon release of the latching member 18 from the latched position, the second leg of the torsion spring 38 stops rotating prior to the latching member 18 reaching the unlatched storage position. Thus, the latching member 18 is able to pivot through a fixed angular range starting from the unlatched storage position before the latching member 18 abuts the second leg 81 of the torsion spring 38. Once the latching mechanism 20 is in the unlatched position, the first section 10 and the second section 12 are rotated into the storage position, so that the bottom plates 14B, 16B are substantially parallel. This causes the sheet 105 to relax and the support arms 104A-I to move towards each other until they are substantially parallel. The portable structure 102 is subsequently inserted into the storage bag 101.

[0102] It will be appreciated that the latching mechanism 20 may comprise any suitable arrangement of a latching member 18 and supports 28, 30 to secure the mounting block 103 in the erect position. For example one or both of the first and second shafts 28, 30 may be replaced by supports that are integrally formed together with the remainder of the first and second section 10, 12. The latching member 18 may for example be arranged to be a "snap fit" onto a suitable integral support and able to pivot in a similar manner to the arrangement that described above. The second support may be in the form of a projecting ridge with an undercut to engage the hook of the latching member 18.

[0103] It will also be appreciated that the resilient element 38 may be any suitable resilient structure; for example a rubber block or an alternative type of spring, such as a compression spring.

[0104] With reference to Figures 10 to 12, an alternative embodiment of a latching mechanism 20' is illustrated. In Figures 10 to 12, features common with the embodiment shown in Figures 1 to 9 share common reference numerals. Note that Figures 10 and 11 are schematic representations in which the support arms 104A-I and the metal plates 14A, 14B, 16A, 16B have been omitted for clarity. As shown in Figure 12, the latching mechanism 20' shown in Figures 10 and 11 is intended for use in the mounting block 103 of Figures 1 to 9 subject to the changes described below.

[0105] In the embodiment shown in Figures 10 to 12, the resilient element 138 is a compression spring located on the first section 10 of the body.

[0106] The first and second supports 128, 130 are provided on the first and second sections 10, 12 respectively and located on the top surfaces 502 thereof.

[0107] A latching member 118 is mounted within a recess 162 of the first support 128 in a direction substantially normal to the top surface 502 of the first section 10. To move between the latched and unlatched positions, the latching member 118 slides transverse to the plane

P defined by the first ends of the support arms 104A-I and the plane of the first section 10 and is biased into a latched position by the resilient element 138. In this embodiment the resilient element is arranged such that the latching element is biased into a raised position.

[0108] The latching member 118 has a catch 166 comprising a leading ramp surface and trailing retaining abutment or tooth located within the recess 162.

[0109] The latching member 118 is further provided with a release portion 168 in the form of a depressible button accessible from the top surface 502 which is linked to the catch 166 and when depressed moves the latching member in a direction U transverse the plane P against the bias of the compression spring 138.

[0110] The recess 162 is also configured to receive the second support 130 in the latched position (see below).

[0111] The second support 130 in this embodiment is in the form of a tongue extending in a direction substantially parallel to the top surface 502 of the second section 12.

[0112] The tongue 130 is a substantially planar quadrilateral cross-sectional profile. The tongue 130 has a hole 164 that extends in a direction perpendicular to the top surface 502 of the second section 10. However, it shall be appreciated that the latching member 118 may have any suitable cross-sectional profile and the hole may be a notch (i.e. a blind hole), capable of acting as a keeper for the catch 166.

[0113] In this embodiment, the catch self-engages with the hole 164 by virtue of the leading edge of the tongue depressing the catch 166 against the bias of the compression spring 138 as the tongue 130 is inserted into the recess 162 in a direction Z. Once the catch 166 aligns with the hole and compression spring 138 is able to relax, the tooth engages the edge of the hole. In this state the first and second sections 10, 12 are retained in a similar position as that of Figure 5 of the first embodiment.

[0114] To move between the latched and unlatched positions, the tongue 130 pivots only with respect to the pivot axis A-A.

[0115] A depth of the recess 162 perpendicular to the top surface 502 of the second section 12 is sufficient to allow the tongue 130 to be received within the recess 162 without contacting the first section 10, when moving between the unlatched and latched positions. In other embodiments the latching member may be curved in the direction of rotation about the pivot axis A-A such that a smaller recess is required.

[0116] To release the latching member 118, the user exerts an external force to depress the release portion 168 in the direction U, which causes the catch 166 to disengage the tongue 130 and the first and second sections 10, 12 to pivot about axis A-A freely.

[0117] In a third alternative embodiment of Figure 13, the latching mechanism 20" may instead comprise a latching member in the form of a tongue 218 arranged in a similar orientation to that 130 of the second embodiment, but being a resilient leaf spring able to flex in di-

rection U and comprising a catch 166 therein. In other words the tongue of this embodiment is not the keeper, in contrast with the second embodiment. Further the tongue 218 itself acts the resilient element in this embodiment.

[0118] The catch 266 is ramped on its leading edge and is arranged to engage a surface of a recess 262, causing the tongue to flex upon insertion into the recess in a direction Z. Once inserted further the catch 266 aligns with a hole or recess 264 that extends to the upper surface of the second section 12 allowing the tongue to relax and self-engage with the hole, with material of the second section 12 between the hole 264 and its free edge acting as the second support 230 acting as the keeper blocking its removal. An upper surface of the catch 266 is arranged to be a release portion 268 accessible through the hole 264. To release the latching mechanism the release portion 268 is depressed by the user, so the tongue flexes in direction U, the catch 266 disengages the hole 264 and the first and second sections 10, 12 are free to pivot about axis A-A.

[0119] In other embodiments the tongue may be pivotally mounted to the first section 10 and biased by a separate resilient element at least when aligned with the keeper.

[0120] It shall be appreciated that although three embodiments of latching mechanism 20, 20', 20" have been described, any suitable latching mechanism may be used to retain the first and second sections 10, 12 in the erected position that is latched or unlatched in a direction having a component of movement in a direction transverse to the plane P.

Claims

1. A portable structure for providing temporary protection for at least one person from environmental conditions, the portable structure comprising:

a mounting block comprising:
 a body having a first section and a second section configured to be pivotable relative to each other about a pivot axis to permit an erection and a collapsing of the portable structure;
 a plurality of support arms, each support arm having a first end secured to the mounting block and arranged to extend outwardly therefrom;
 an erecting mechanism configured to apply a force to move the first section and the second section of the body towards each other; and
 a latching mechanism configured to releasably secure the first section of the body to the second section of the body in a latched position, the latching mechanism comprising a latching member coupled to the first section, and the latching mechanism being configured such that a movement of the latching member to effect latching

and/or unlatching has a component of motion in a direction that is normal to a plane defined by the first ends of the support arms when the first section and second section are brought into alignment.

2. The portable structure of claim 1, wherein the latching mechanism further comprises a resilient element configured to apply a force to the latching member to release the latching member into an unlatched position and/or retain the latching member in the latched position, optionally wherein the resilient element is a spring; for example a torsion spring or a compression spring. 10
3. The portable structure of claim 2, wherein the latching member and the resilient element are arranged in such a way that when the latching mechanism is moved into the latched position, the resilient element generates a restoring force. 20
4. The portable structure of any preceding claim wherein the latching member is pivotably mounted to the first section of the body. 25
5. The portable structure of claim 4 wherein the latching member is arranged to pivot about an axis substantially parallel to the pivot axis of the first section relative to the second section. 30
6. The portable structure of any preceding claim wherein in the latched position the latching member is releasably attached to a keeper located on the second section of the body, and/or wherein the keeper is fixedly mounted to or integral with the second section of the body, 35
7. The portable structure of claim 6 wherein the keeper is a formation that extends substantially parallel to the pivot axis, and/or wherein the latching member comprises a hook or tooth for releasably attaching to or abutting the keeper in the latched position. 40
8. The portable structure of any preceding claim wherein a clearance is provided between the first section and the second section when in a latched condition. 45
9. The portable structure of any preceding claim wherein the latching member comprises an elongate hook profile wherein the hook profile extends in a direction parallel to the pivot axis, 50
10. The portable structure of any preceding claim wherein the first section comprises a retention mechanism arranged to releasably retain the latching member against a surface of the first section in a storage position optionally wherein the latching member is formed at least partially from a metallic material, and 55

wherein the retention mechanism includes a magnetic element arranged to magnetically attract the latching member to the storage position, and/or wherein the resilient member urges the latching member into the storage position.

11. The portable structure of any one of claims 1 to 3 or 7 to 9, wherein the latching member is rigidly attached to the first section.
12. The portable structure of any one of claims 1 to 3 or 7 to 9, wherein the latching member is translatably mounted to the first section.
13. The portable structure of any preceding claim, wherein the latching mechanism comprises a release member actuatable by a user to release the latching member, optionally wherein the release member is a part of the latching member.
14. The portable structure of any preceding claim wherein the erecting mechanism comprises at least one erecting pole arranged to be releasably or permanently mounted to one of the first section and the second section.
15. The portable structure of any preceding claim wherein the first section comprises a first mount for receiving the erecting mechanism and the second section comprises a second mount for receiving the erecting mechanism.

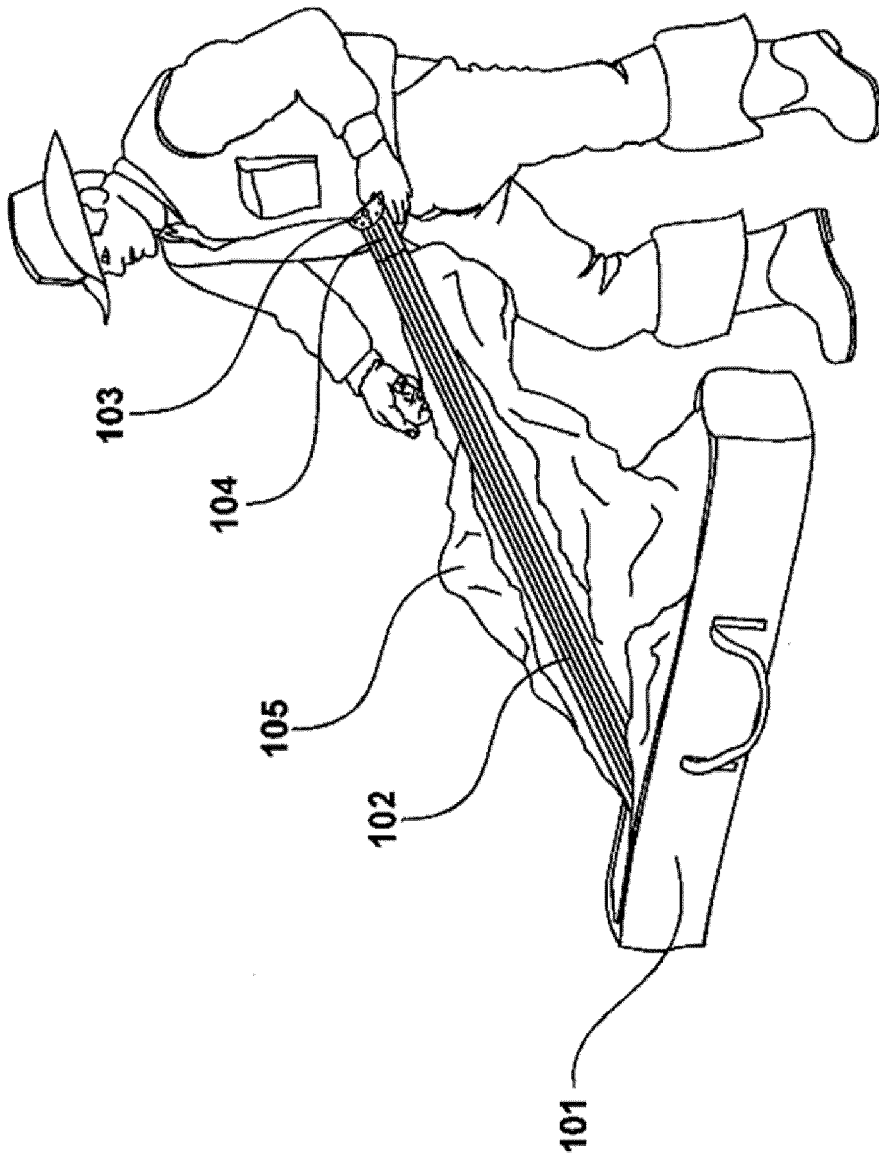


FIG. 1

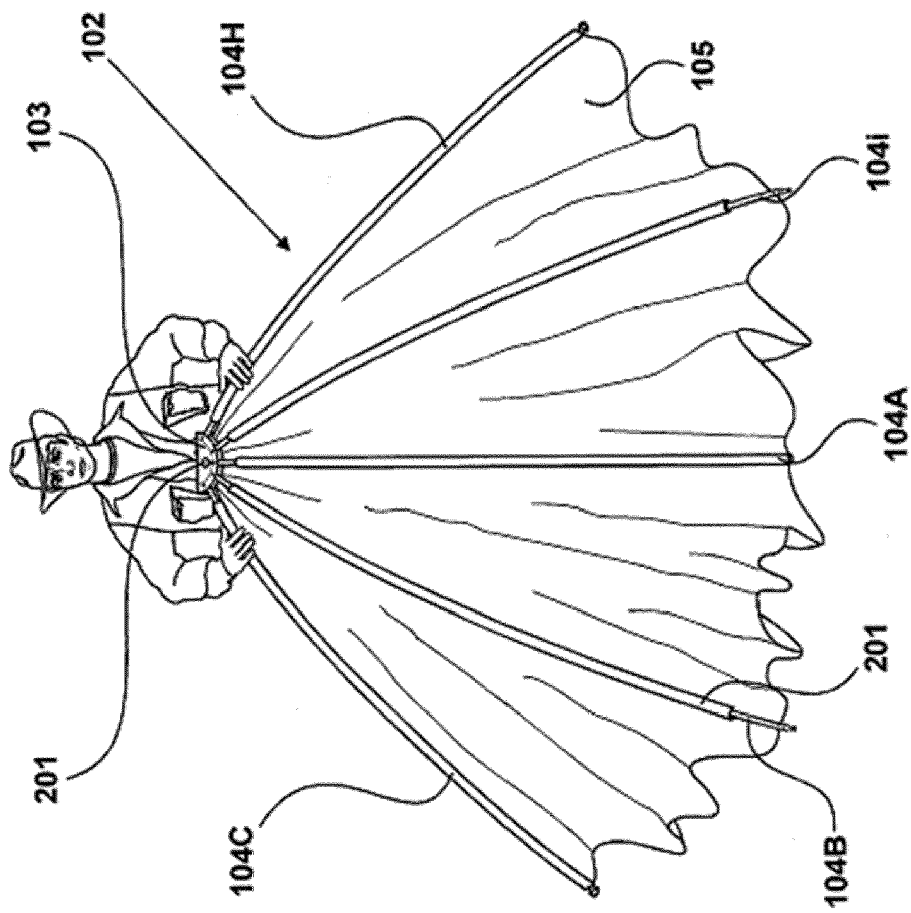


FIG. 2

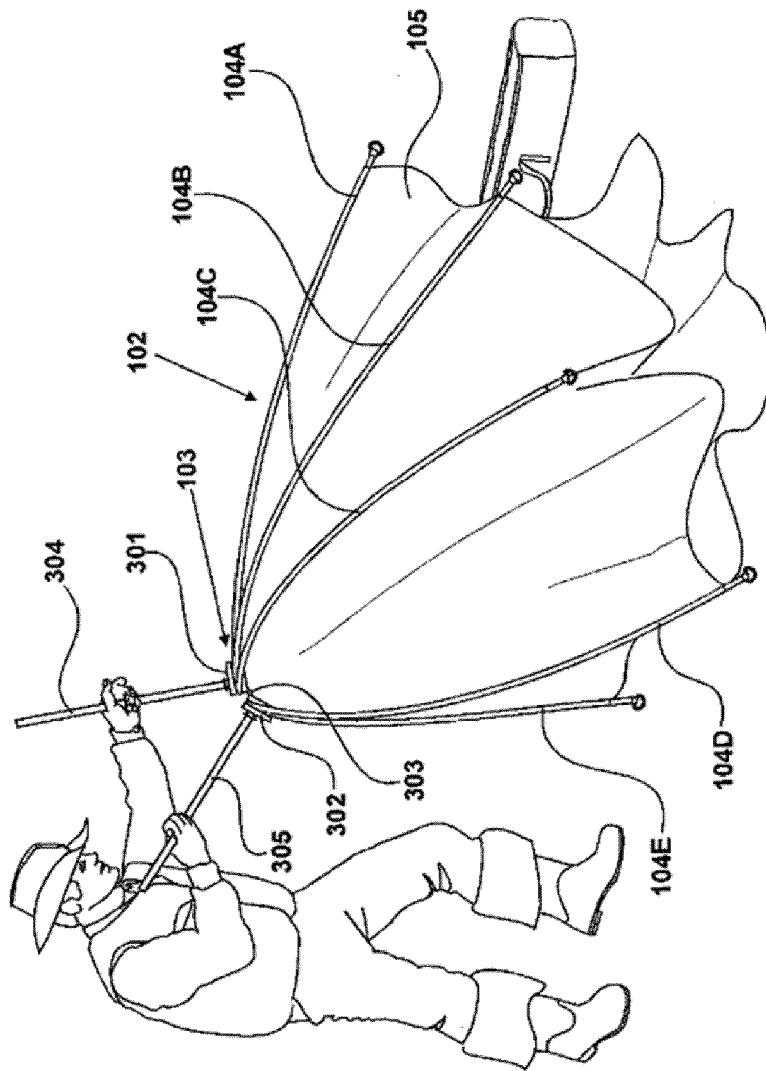


FIG. 3

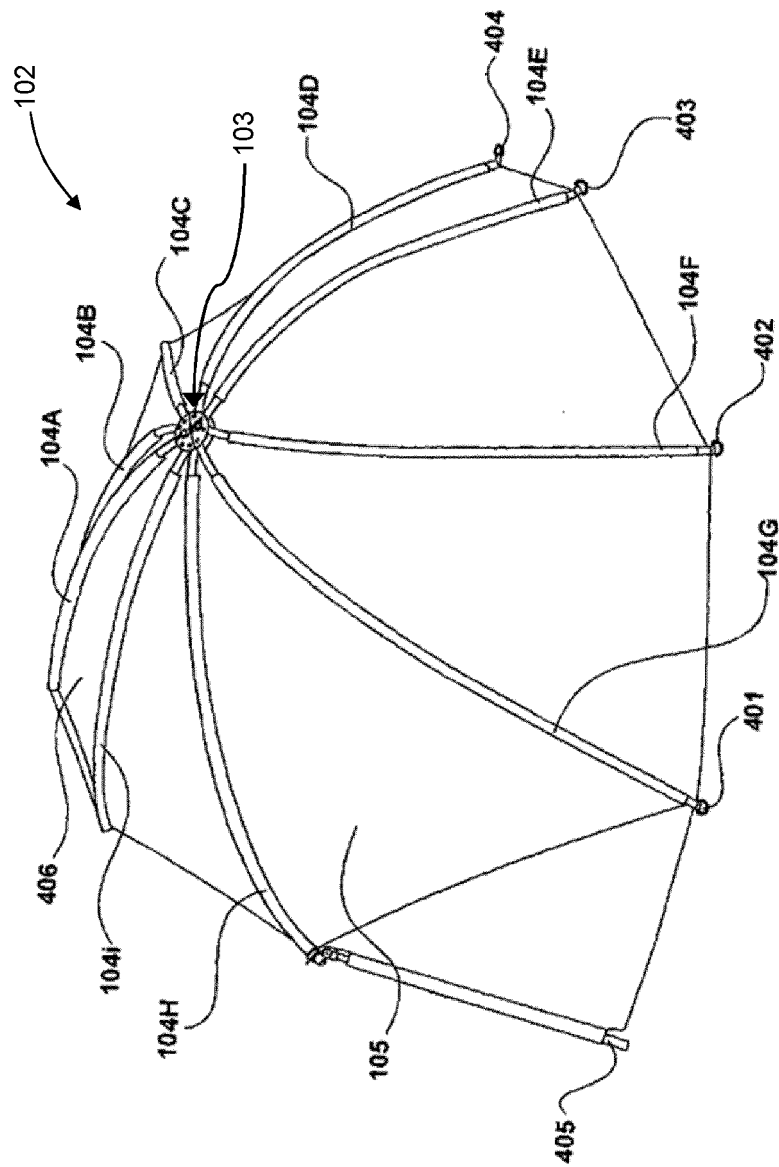


FIG. 4

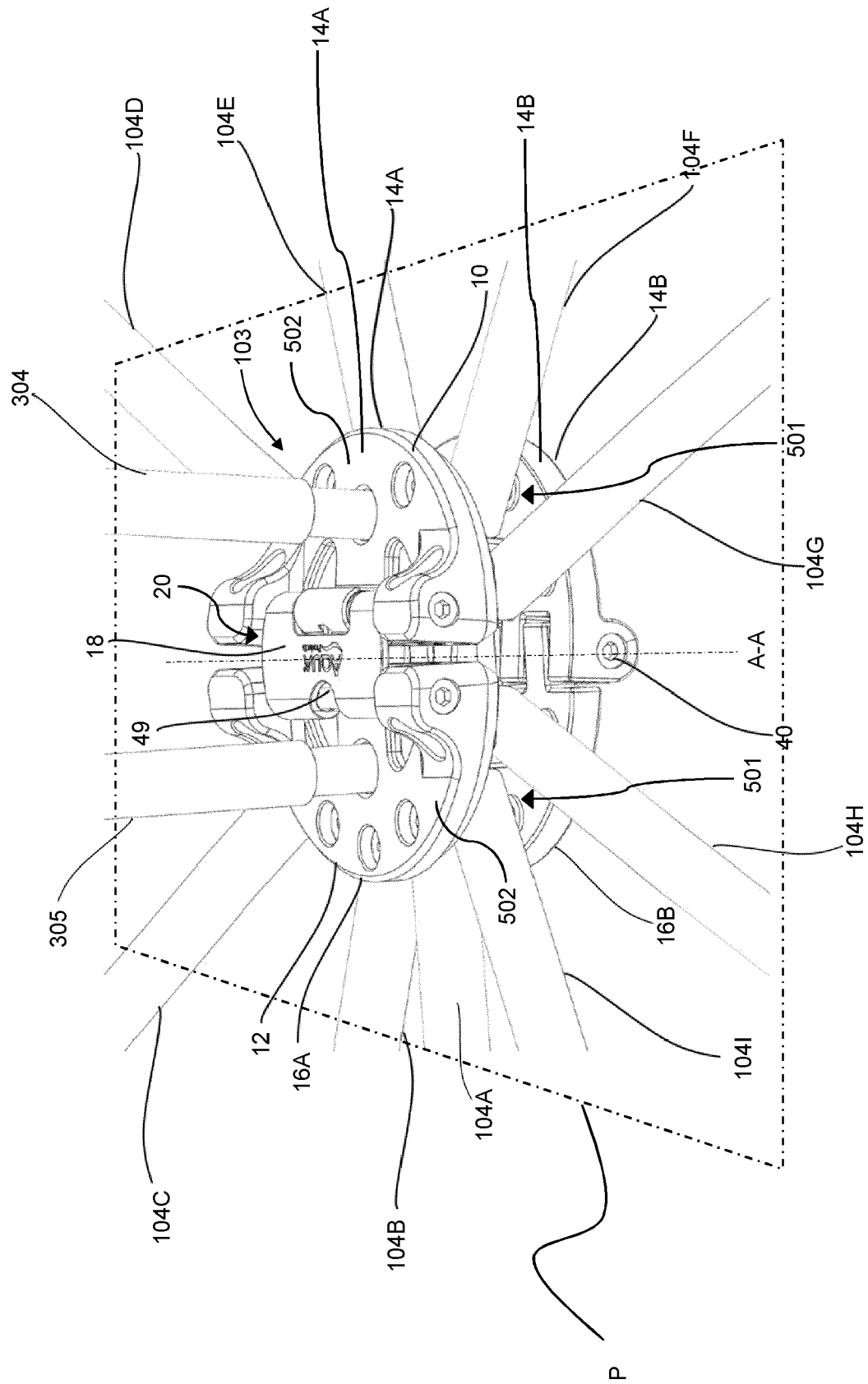


FIG. 5

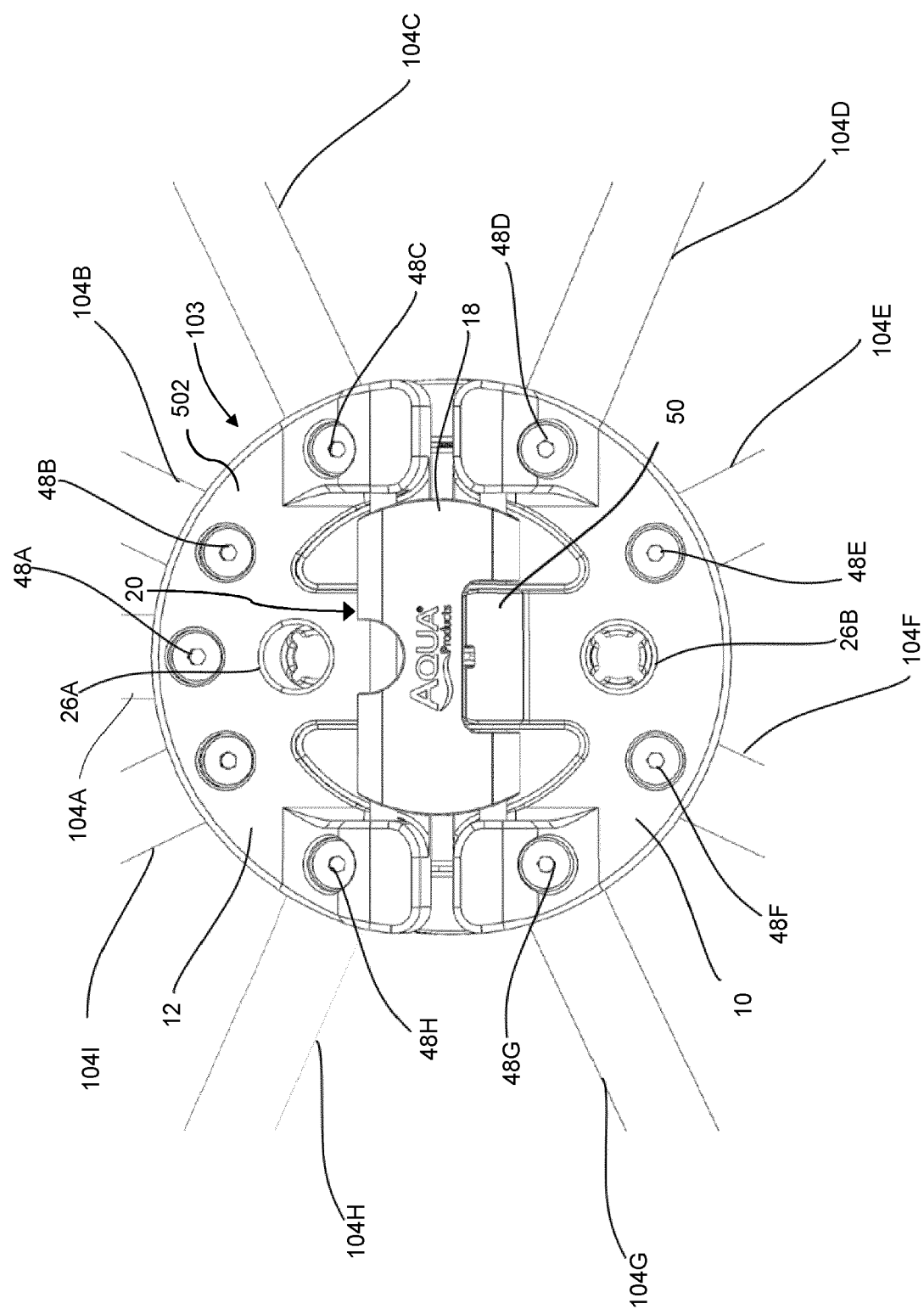
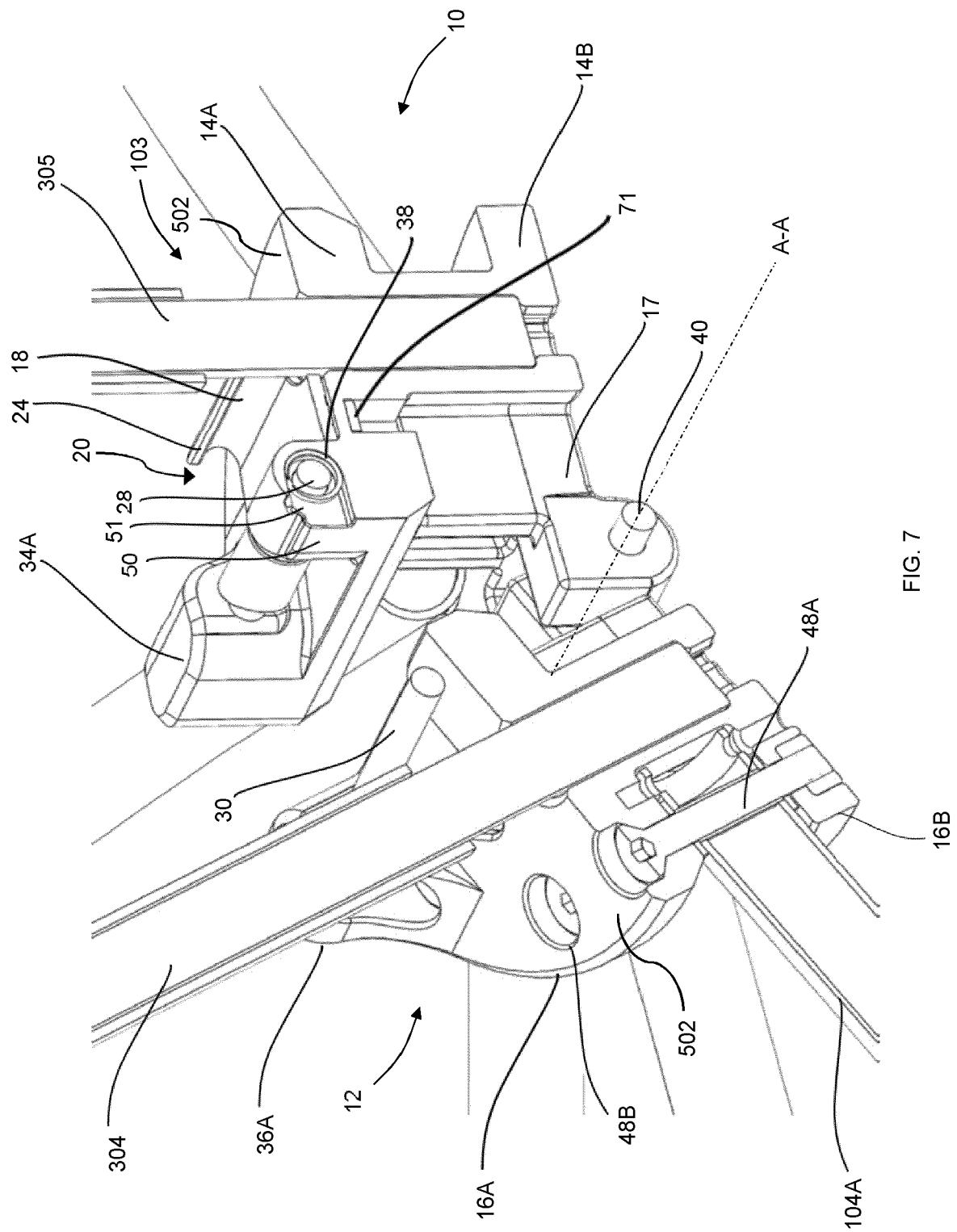


FIG. 6



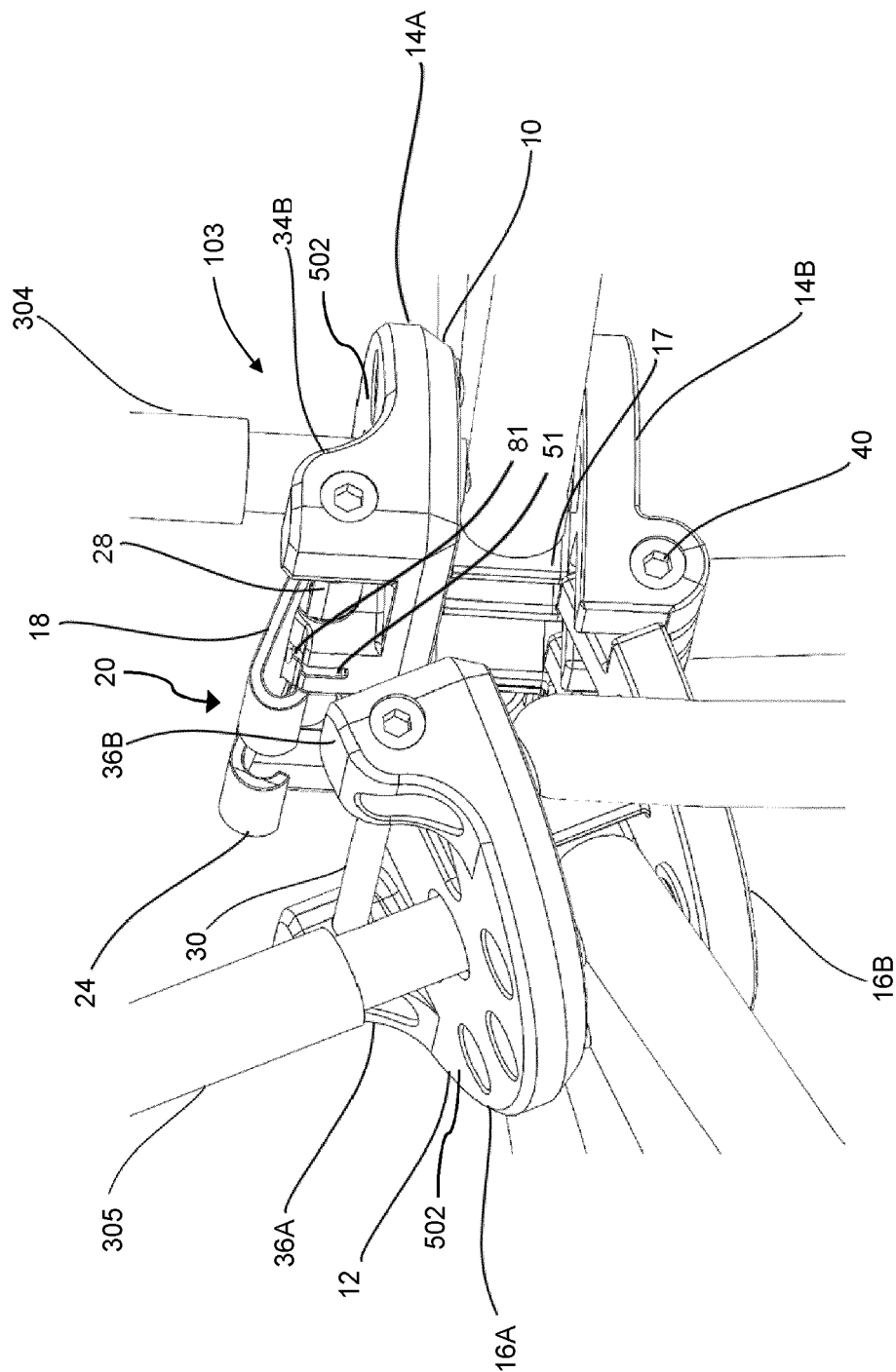


FIG. 8

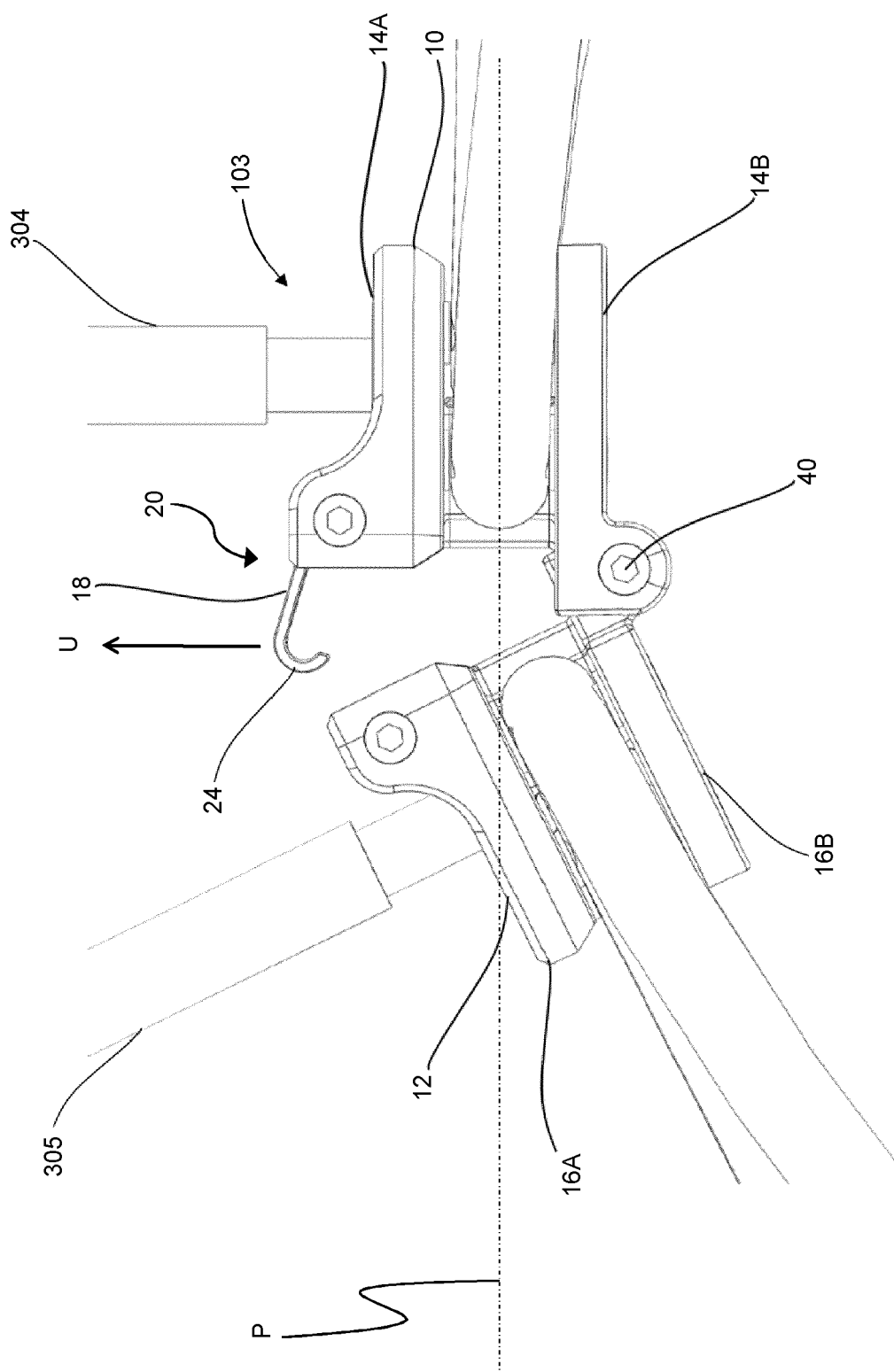


FIG. 9

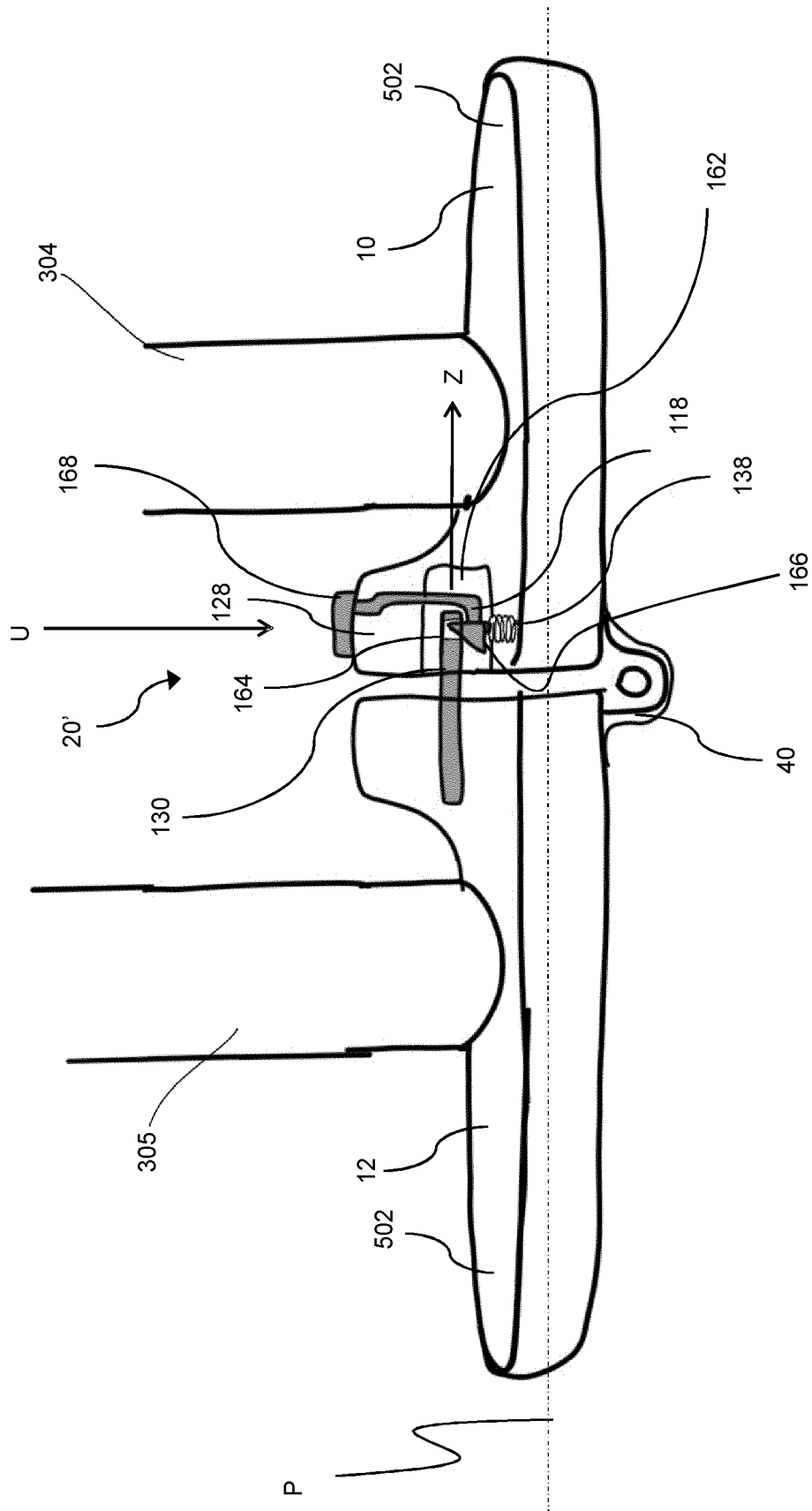


FIG. 10

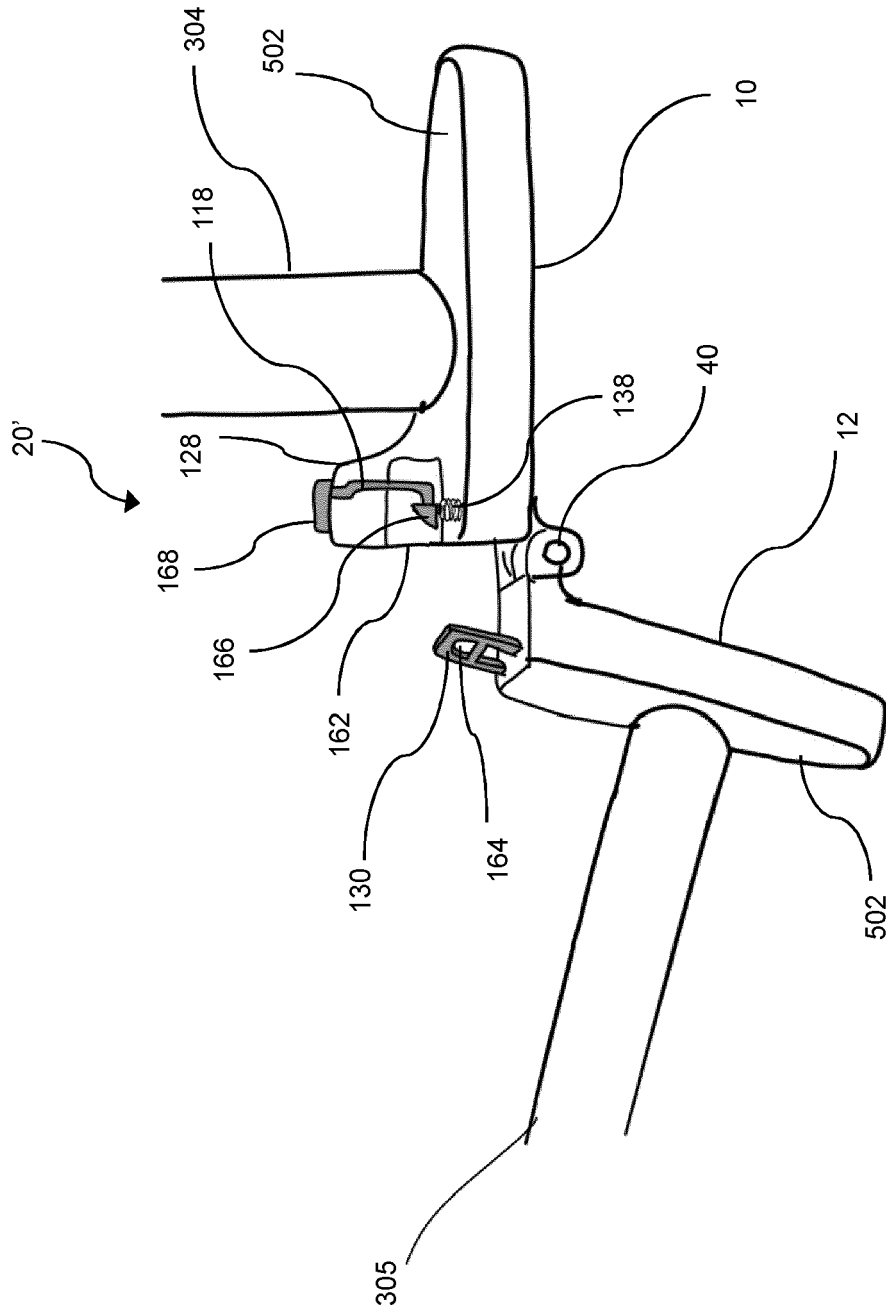


FIG. 11

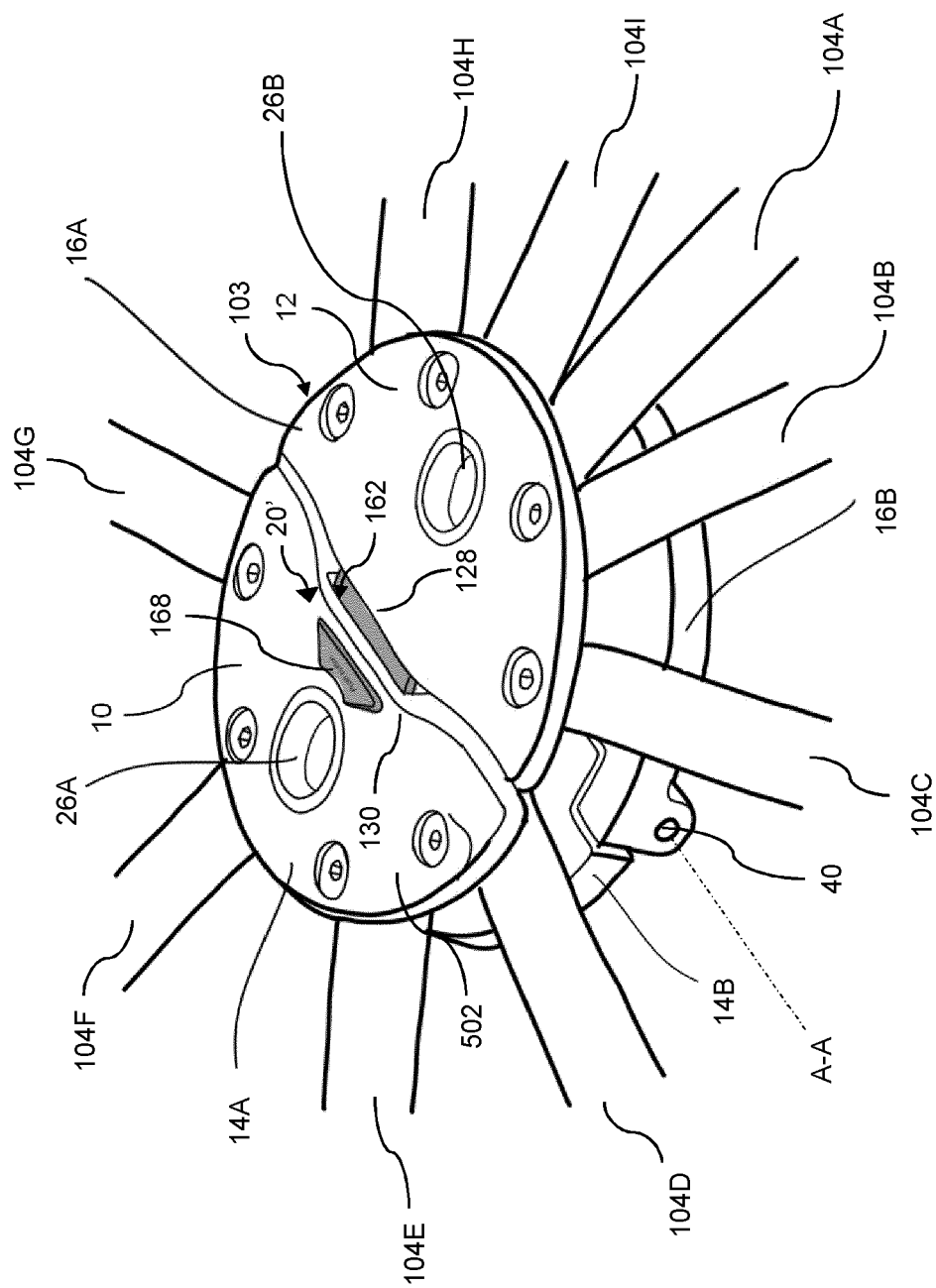


FIG. 12

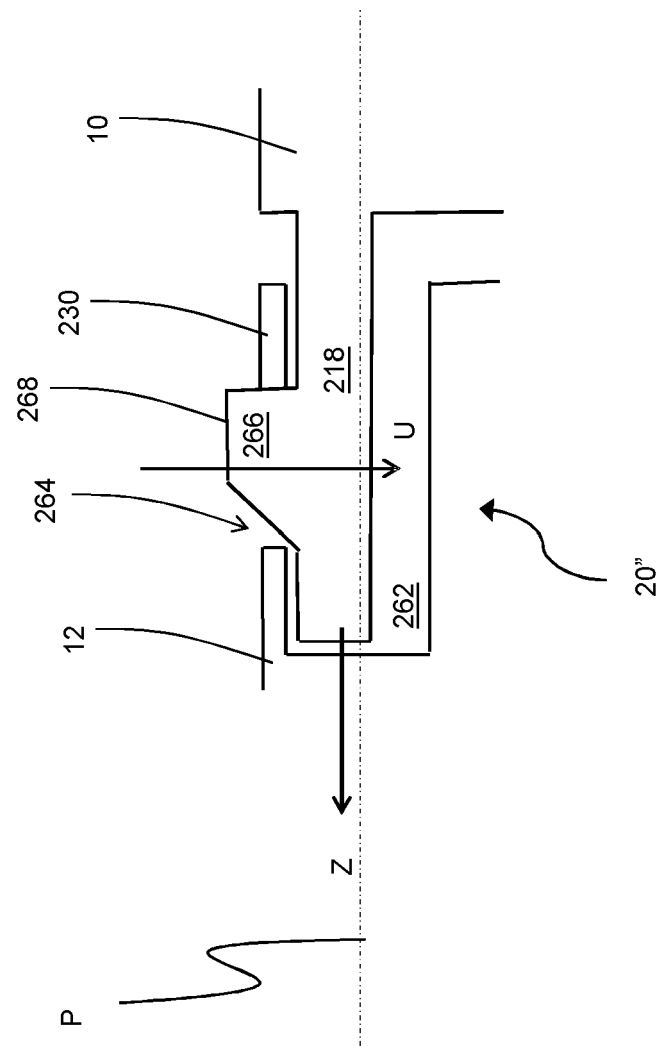


FIG. 13



EUROPEAN SEARCH REPORT

 Application Number
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			E04H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 November 2021	Examiner Brucksch, Carola
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 21 18 7248

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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26-11-2021

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