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(54) **Umbrella**

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Description

Background of the Invention

Field of the Invention

[0001] This application is directed to an umbrella that has a canopy suspended from an extendable support member. In particular, this application is directed to an umbrella that includes extension and deployment mechanisms that can be driven by a crank handle.

Description of the Related Art

[0002] Umbrellas have been developed to provide shelter from the elements and are particularly useful in outdoor seating areas, such as on a backyard patio. Typically, an umbrella comprises a support pole and a canopy positioned at the top of the pole for providing shade. Basic umbrellas have the support pole centrally located directly beneath the canopy. This construction has several disadvantages. For example, the pole is located at the most sheltered position under the canopy. Also, the pole obstructs the view of persons seated beneath the canopy. Some umbrella designs locate the support pole to the side of the canopy, generally suspending the canopy from above. A disadvantage of these designs is that they take up more space than umbrellas supported from below. A few umbrella designs support a canopy from above and are retractable to reduce the amount of space that they require.

[0003] For example, United States Patent Application Publication No. 2004/0055628 A1 describes an umbrella that includes upper and lower support rods, ribs, a panel supported by the ribs, and a hand cranking device. The upper rod is located within the lower rod of the retractable device. The hand cranking device is located within a lower portion of the lower support rod. The hand cranking device includes a drive worm gear connected to a handle. Separate driven worm gears are positioned on two sides of the drive worm gear. The driven worm gears separately connect to rotating wheels. Each of the wheels has a rope entwined upon it. One rope is coupled with the ribs and thereby with the panel. The other rope is coupled with the upper support rod. The umbrella is arranged so that the upper rod is extended from the lower rod and the panel is deployed by turning the handle. More particularly, the umbrella is arranged so that turning the handle simultaneously extends the upper rod and then deploys the panel. Reverse operation of the hand crank closes the panel and then retracts the upper rod.

[0004] This arrangement is disadvantageous in several respects. For example, the upper support rod apparently has to be fully extended from the lower support rod in order for the ribs and panel to be expanded. This greatly limits the positionability of the umbrella. In particular, this arrangement requires the entire umbrella to be repositioned for changes in position of the sun. Additionally, impairment of one of the extension function and the deployment function will render the umbrella inoperable.

[0005] Another design that is commercially available comprises upper and lower support rods, a handle to deploy a canopy, and a locking screw. In this device, the upper and lower support rods are side-by-side and are joined by a figure-8 shaped block. The block includes a tightening screw that clamps the upper support rod to the lower support rod. The canopy is raised by loosening the screw and pushing the upper support rod by hand to a higher elevation. To maintain the upper support rod at the higher elevation, the tightening screw is tightened. This umbrella design has several disadvantages. For example, it can only be raised and lowered by hand. As such, the height to which the canopy can be raised is limited by the height of the user. Additionally, the size and choice of materials for the umbrella are limited by the requirement that the assembly be light enough to be lifted by a user. Thus, this design inherently limits the range of possible applications and uses. Additionally, the block slides along the lower support rod and could damage or disfigure the outer surface thereof.

Summary of the Invention

[0006] It is therefore an object of one embodiment of the invention to provide an umbrella that is more robust and more reliable and in which a canopy thereof can be operated independently of the elevation of the canopy.

[0007] In one embodiment, an umbrella assembly is provided that comprises a canopy frame and a support pole structure for said canopy frame. The support structure includes means for suspending said canopy frame, that comprises a first curved pole having an upper end coupled with the canopy frame. The support pole structure also includes a second pole supporting said curved pole and having a lower end, an upper end, and a longitudinal axis, and a junction adjacent said upper end of said second pole that defines a passageway through which the curved pole can be moved generally transversely to the longitudinal axis of the second pole. The umbrella also includes an extension mechanism and a canopy deployment mechanism.

The extension mechanism is coupled with the support structure and is configured to be driven by a crank to move the curved pole through the passageway to extend or retract the curved pole. The canopy deployment mechanism is coupled with the support structure and is configured to be driven by a crank of the extension mechanism, to open and close the canopy frame. The means has a lower end which can be retracted to a position where said lower end of said means extends below and beyond the passageway.

[0008] In another embodiment, an umbrella is provided that includes a base, a canopy, and a support pole. The canopy has a canopy frame and a canopy fabric. The support pole has an upright pole, a curved pole, and an extension mechanism housing. The upright pole has a

lower end coupled with the base, an upper end, and a longitudinal axis. The curved pole has an upper end coupled with the canopy and a lower end. The curved pole defines an enclosed space therein. The extension mechanism housing is located at the upper end of the upright pole. The extension mechanism defines a passage through which the curved pole can be moved generally transversely to the longitudinal axis of the upright pole. The umbrella also includes an extension mechanism and a canopy deployment mechanism. The extension mechanism is at least partially housed within the extension mechanism housing. The extension mechanism includes a pinion gear and a rack. The pinion gear is mounted in the extension mechanism housing to rotate about an axis extending generally transversely to the longitudinal axis of the upright pole. The rack is coupled with the curved pole and configured to be driven by the pinion gear. Rotation of the pinion gear is converted to translation of the curved pole within the passage. The canopy deployment mechanism is coupled with the support pole adjacent the lower end of the curved pole. The canopy deployment mechanism has a drum mounted in the enclosed space of the curved pole and a tension member. The tension member has a lower end coupled with the drum and an upper end coupled with the canopy frame. The umbrella also includes a crank configured to engage the extension mechanism and the canopy deployment mechanism. The extension mechanism is configured to move the curved pole between a retracted position and an extended position. The lower end of the curved pole is located outside the extension mechanism housing when the curved pole is in the retracted position.

Brief Description of the Drawings

[0009] Some preferred embodiments of the invention will now be more particularly described by reference to the accompanying drawings, in which:

[0010] FIGURE 1 is a plan view of one embodiment of an umbrella assembly shown in an extended position;

[0011] FIGURE 1A is a cross-section view of a portion of a support pole structure of the umbrella at the location indicated in FIGURE 1;

[0012] FIGURE 1B is a cross-section view of another portion of the support pole structure of the umbrella at the location indicated in FIGURE 1;

[0013] FIGURE 2 is a cross-section view of a portion of the embodiment of FIGURE 1 taken at the section 2-2, illustrating the umbrella assembly in an open position;

[0014] FIGURE 3 is a cross-section view similar to that of FIGURE 2, illustrating the canopy frame in a closed position;

[0015] FIGURE 4 is a cross-sectional view of a portion of one embodiment of an extension mechanism of the umbrella assembly of FIGURE 1 taken at the section 4—4;

[0016] FIGURE 5 is a partial cross-section view of the extension mechanism of FIGURE 4 taken at the section 5—5;

[0017] FIGURE 5A is an end view of one embodiment of a brake system of the umbrella assembly of FIGURE 1;

[0018] FIGURE 6 is a partial cross-section view of one embodiment of a canopy deployment mechanism of the umbrella assembly of FIGURE 1 taken at the section 6—6;

[0019] FIGURE 7 is a partial cross-section view of a portion of the extension mechanism of the umbrella assembly of FIGURE 1 taken at the section 7—7;

[0020] FIGURE 8 is a partial cross-section of the extension mechanism of the umbrella assembly of FIGURE 1 taken at the section 8—8; and

[0021] FIGURE 9 is a cross-section of one embodiment of a portion of a canopy frame taken at the section 9—9.

Detailed Description of the Preferred Embodiment

[0022] This application is directed to umbrellas and umbrella assemblies with a support pole structure having at least two members that are movable relative to each other to position a canopy in one or more extended positions and in one or more retracted positions. In various embodiments, discussed below in connection with FIGURES 1-9, the support pole structure includes a first member, which may be a fixed pole, and a second member, which is a curved pole coupled with a canopy frame. The second member moves relative to the first member. In some embodiments, movement of a second member of a support pole structure relative to a first member of the support pole is achieved by driving a driven member coupled with an outer surface of the second member, as discussed further below.

[0023] FIGURES 1-9 illustrate various embodiments of an umbrella 6 that includes a base 8, an umbrella assembly 10, and a canopy fabric 12. The canopy fabric 12 is shown schematically in FIGURE 1 as a dashed line. The applicant contemplates that the canopy fabric 12, the base 8, and or other components of the umbrella 6 can be customized to the tastes or needs of the consumer. Thus, the umbrella assembly 10 can be made and sold separately from these components. Accordingly, this application is directed to relevant subassemblies of the umbrella 6 and the other umbrellas described herein.

[0024] The umbrella assembly 10 preferably includes a canopy frame 14, a support pole 18, an extension mechanism 22, and a canopy deployment mechanism 26. The term "canopy" is used in connection with some embodiments to include the canopy frame 14, the canopy fabric 12, and other related components. The canopy fabric 12 can be made of a natural or synthetic cloth or any other structure that can be overlaid of stretched over the canopy frame 14 to provide shelter, as discussed below.

[0025] In one embodiment, the support pole structure 18 is a support structure that has a first member 38 and a second member 42. The first and second members 38, 42 are elongate members in some embodiments. The

first member 38 has a first end 46 and a second end 50. As discussed further below, in various embodiments, the first member 38 is coupled with or is formed to include other structures. For example, in one embodiment, an extension mechanism housing 52 is coupled with the first member 38. The extension mechanism housing 52 can enclose at least some of the components of the extension mechanism 22 to shroud these components, providing protection for these components and preventing objects from becoming lodged therein.

[0026] The first member 38 can also be coupled with, formed to include, or can comprise a substantially vertical portion 56. In one embodiment, the substantially vertical portion 56 is configured to be coupled with the base 8 at a first end 58 and with the extension mechanism housing 52 at the second end 60. The substantially vertical portion 56 can be elongated, extending along a longitudinal axis between the first and second ends 58, 60. In one embodiment, the umbrella 6 rests on or is mounted to a horizontal surface, such as the ground, a patio, or a deck or other stable structure. The substantially vertical portion 56 can be configured as an upright pole portion. In some applications, the umbrella 6 can be mounted to a vertical surface and the substantially vertical portion 56 can be configured to extend outwardly from the vertical surface.

[0027] The first member 38 preferably comprises a tubular portion with a passage through which the second member 42 travels between extended and retracted positions. In one embodiment, the extension mechanism housing 52 comprises a tubular portion. Travel of the second member 42 relative to the first member 38 or the extension mechanism housing 52 can be facilitated by bearing structures, which are discussed below in connection with FIGURES 7 and 8. In one embodiment, the extension mechanism housing 52 is located adjacent to the second end 60 of the substantially vertical portion 56. The extension mechanism housing 52 also can be located adjacent to the first end 46 of the first member 38. The extension mechanism 22 can be located adjacent to the second end 60 of the substantially vertical portion 56, the first end 46 of the first member, or at any other convenient position on the umbrella 6.

[0028] The second member 42 has a first lower end 62 and a second upper end 66. The second member 42 preferably is coupled with the canopy frame 14, e.g., at the second upper end 66. Any suitable connection can be provided. As discussed below in connection with FIGURES 2 and 3, one preferred connection between the second member 42 and the canopy frame 14 is a pivot or hinge-type connection.

[0029] The second member 42 is coupled with the first member 38 and is movable relative to the first member 38. In particular, the second member 42 preferably is movable between retracted positions and extended positions. An extended position is illustrated in part in FIGURES 1 and 2. A retracted position is illustrated in part in FIGURE 3.

[0030] The first member 38 comprises a curved pole in one embodiment that encloses a passage 68. The passage 68 is shown in FIGURE 4. The second member 42 comprises a curved pole, which is able to be received in the passage 68. In some embodiments, a wall of the first member 38 surrounds the passage 68. In other embodiments, the first member 38 at least partially surrounds a space within which the second member 42 extends and can travel.

[0031] The second member 42 is a semi-cylindrical curved pole in one embodiment that has a recess 72 formed therein. The recess 72, which is shown in FIGURES 1B and 5, can be configured to house at least a portion of the extension mechanism 22, as discussed further below. The recess 72 also can act as a guide track for a bearing structure or a guide member, as discussed further below. The second member 42 preferably also defines an enclosed space 74 that extends between the first and second ends 62, 66. As discussed below, the space 74 is convenient for housing one or more components of the canopy deployment mechanism 26.

[0032] In one embodiment, the second member 42 has a length between the first and second ends 62, 66 that is greater than a length of the first member 38 between the first and second ends 46, 50. In this arrangement, the first lower end 62 remains outside the passage 68 formed in the second member 38 in at least one of an extended position and a retracted position. In one embodiment, the first end 62 remains outside the passage 68 both in an extended position and in a retracted position.

[0033] With reference to FIGURES 4 and 5, various embodiments of the extension mechanism will be discussed. The extension mechanism 22 can take any suitable form and can be coupled with the support pole 18 at any convenient location, e.g., at the extension mechanism housing 52. In one arrangement, the extension mechanism housing 52 includes a first portion 52a and a second portion 52b that are coupled together with one or more suitable fasteners, e.g., screws 54. This arrangement is advantageous in that the extension mechanism housing 52 can be disassembled quickly so that the extension mechanism 22 can be serviced.

[0034] In one embodiment, shown in FIGURE 5, the extension mechanism 22 includes a crank handle 80, a shaft assembly 84, a drive member 88, and a driven member 92. As discussed below, the drive member 88 can be coupled with the shaft assembly 84.

[0035] The shaft assembly 84 can be mounted to the support pole structure 18 in any suitable manner. In one arrangement, the umbrella 6 is provided with a shaft mounting portion 104. In one embodiment, the extension mechanism housing 52 is provided with a shaft mounting portion 104. The shaft mounting portion 104 includes a shaft passage 108 extending generally transverse to the extension mechanism housing 52, e.g., between an external surface of the first and second portions 52a, 52b thereof. The shaft passage 108 preferably is at least partially enclosed by a wall 110. The wall 110 can have a

shape corresponding to the drive member 88 or another component of the extension mechanism 22. In one arrangement, the shaft passage 108 is accessible at a first end by removing a cover member 112. The cover member 112 is a plate in one embodiment. In one arrangement, the cover member 112 is configured to be coupled with the extension mechanism housing 52 by one or more screws 116. The shaft passage 108 can be accessible at a second end through a small hole in the second portion 52b of the extension mechanism housing 52.

[0036] The shaft assembly 84 can take any suitable form. In one embodiment, the shaft assembly 84 includes a shaft 128 (shown in FIGURE 4) that extends through the passage 108. The shaft preferably is journaled for rotation within the extension mechanism housing 52. For example, one ore more bearings can be coupled with the extension mechanism housing 52 and with the shaft 128 to facilitate rotation of the shaft. The shaft 128 is configured to rotate about an axis A1. The axis A1 also is generally transverse to the extension mechanism housing 52. The axis A1 extends generally transversely to the longitudinal axis A2 of the substantially vertical portion 56 in one embodiment.

[0037] Preferably the shaft 128 is configured such that the drive member 88 can be mounted thereon. In one arrangement, the shaft 128 is stepped so that the shaft has at least two diameters along its length. This arrangement provides at least one shoulder against which a portion of the drive member 88 (e.g., a side surface thereof) can be positioned. In one arrangement, the shaft assembly 84 also includes a sleeve 132 configured to slide over a portion of the shaft 128. The sleeve 132 is configured to be positioned adjacent another portion of the drive member 88 (e.g., another side surface thereof). In one arrangement, a shoulder of the shaft 128 and the sleeve 132 cooperate to maintain the drive member 88 in a relatively fixed position along the length of the shaft 128. In one embodiment, the sleeve 132 is configured to extend from a side surface of the drive member 88 to an internal wall of the second portion 52b of the extension mechanism housing 52. In this arrangement very little space is provided between the internal wall of the second portion 52b and the sleeve 132 and between the sleeve 132 and the drive member 88. By limiting the space between these components, axial movement of the drive member 88 along the shaft 128 toward the second portion 52b is limited.

[0038] The arrangement of the extension mechanism 22 is advantageous in that it enables the drive member 88 to be quickly and easily accessed and disassembled from the shaft assembly 84 for service or repair. Also, portions of the shaft assembly 84 can be relatively easily disassembled and serviced in this arrangement. The shaft assembly 84 can be modified in other embodiments. For example, the drive member 88 could be interference fit to the shaft 128.

[0039] The shaft 128 preferably also has a crank engagement portion 136, which may be a recess formed to receive an end of the crank handle 80. For example, the end of the crank handle 80 and the recess 136 can each have a matching shape such that when the crank handle 80 is inserted into the crank engagement portion 136, a force can be transmitted therebetween. In one arrangement, both the crank engagement portion 136 and an end of the crank handle 80 have a similar shape and the size of the crank engagement portion 136 is somewhat larger than that of the crank handle 80. In one embodiment, the crank engagement portion 136 and the end of the crank 80 configured to engage the crank engagement portion 136 is are rectangular in shape. In these embodiments, an end of the crank handle 80 can be inserted into the crank engagement portion 136 such that rotation of the crank handle 80 causes the shaft 128 and the drive member 88 to rotate.

[0040] Other arrangements can facilitate engagement of the crank handle 80 and the shaft assembly 84. For example, spring-loaded members 140 can be mounted on the crank handle 80 and corresponding recesses can be formed within the crank engagement portion 136, e.g., in a detent arrangement.

[0041] The drive member 88 can take any suitable configuration. In one arrangement, the drive member 88 is a gear. However, any arrangement can be provided whereby the drive member 88 is configured to transmit a force to the second member 42. As discussed below, a rack-and-pinion gear arrangement is preferred for some configurations. The drive member 88 can be a pinion gear having a plurality of gear teeth.

[0042] The driven member 92 preferably is coupled with the second member 42. As discussed above, the second member 42 is a curved pole. In one embodiment, the driven member 92 is coupled with an outer surface 160 of the second member 42. As used in this context, the term "outer surface" is a broad term, including surfaces of the second member 42 that are not fully enclosed prior to the assembly of the support pole 18. The term "outer surface" also can include surfaces that may be at least partially housed within other components of the umbrella 6, such as the extension mechanism housing 52. See FIGURE 5. The driven member 92 is configured to engage the drive member 88 and to be driven thereby upon rotation of the drive member 88. As discussed above, the drive member 88 may be rotated by the crank handle 80.

[0043] The driven member 92 may take any suitable form. Preferably the driven member 92 is a gear-type structure, for example a gear rack. In this context "gear rack" is a broad term that includes rigid and somewhat flexible structures with a surface or a series of regularly positioned surfaces capable of engaging the drive member 88. The term "gear rack" includes a rigid gear rack, a flexible belt with a plurality of teeth or ridges, and other similar structures. An advantage of the belt-type gear rack is that it can more easily conform to a curved profile of the second member 42 where provided.

[0044] In one embodiment, the driven member 92 is

configured to be driven by the drive member 88. For example, as discussed above, the crank handle 80 is coupled with the crank engagement portion 136 and rotated. This rotation of the crank handle 80 causes the drive member 88 to rotate. Because the drive and driven members 88, 92 are engaged, a force can be transmitted therebetween. Such a force can be transmitted from the driven member 92 to the second member 42. The rotation of the drive member 88 (which can be caused by rotation of the crank handle 80) is converted to translation of the second member 42 within the extension mechanism housing 52. The second member 42 also can translate within the passage 68.

[0045] In some embodiments, a brake system 168 is provided that limits or prevents movement of the second member 42 relative to the first member 38, e.g., after the second member 42 has been moved to an extended position. The brake system 168 can take any suitable form. In one embodiment, the brake system 168 includes a resilient member 170, which can be a coil spring. The resilient member 170 can be positioned inside the shaft passage 108, e.g., in a recess 172 formed on an inside surface of the cover member 112. In one embodiment, the resilient member 170 has a first end 174a and a second end 174b. As discussed further below, the first and second ends 174a, 174b are configured to be engaged by another member to compress the resilient member 170. In particular, as discussed below, a force is applied to the first and second ends 174a, 174b to compress the member 170. In one embodiment, the brake system 168 is arranged such that when the resilient member 170 is not compressed by a force applied to the first and second ends 174a, 174b, the resilient member frictionally engages a surface 176 defined in the recess 172. The frictional engagement is such that relative movement between the drive and driven members 88, 92 and between the first and second members 38, 42 is prevented. In this sense, the cover member 112 or the surface 176 acts as a brake drum and the resilient member 170 acts as a brake shoe.

[0046] With further reference to FIGURE 5A, the brake system 168 also includes a first brake engagement member 178 coupled with the shaft 128. The first brake engagement member 178 is configured such that when the brake system 168 is assembled, the brake engagement member is positioned adjacent to the ends 174a, 174b. In one arrangement, the first brake engagement member 178 comprises an arc that subtends an angle of more than 180 degrees, e.g., about 270 degrees, or more. The first brake engagement member 178 can be coupled with the shaft 128 in any suitable fashion. In one arrangement a thru-hole is formed in the first brake engagement portion 178 and a recess or thru-hole is formed in the shaft 128 such that a pin 179 can be inserted through the first brake engagement portion 178 and into the shaft 128 to couple the first brake engagement portion 178 with the shaft 128.

[0047] In one embodiment, the brake system 168 also includes a second brake engagement portion 180 that is coupled with the drive member 88. The second brake engagement portion 180 preferably extends axially and laterally of the drive member 88 into the recess 172 of the cover member 112. The second brake engagement portion 180 extends to a location adjacent to the first and second ends 174a, 174b of the resilient member 170.

[0048] In use, rotation of the crank handle 80 causes at least one of the first and second brake engagement portions 178, 180 to engage the resilient member 170. In the illustrated embodiment, small gaps are provided between adjacent edges of the first and second brake engagement portions 178, 180. These gaps are sized to receive the first and second ends 174a, 174b and are small enough that a relatively small rotation of the crank handle 80 (and the shaft 128) causes one of the brake engagement portions to engage one of the ends of the resilient member 170. Such engagement causes the resilient member 170 to be compressed. Compression of the resilient member 170 causes the member to be disengaged from the surface 176 of the recess 172. For example, compression of the resilient member 170 can reduce the force applied by the resilient member 170 to the surface 176. As the force is reduced, relative motion of the first and second members 38, 42 is no longer prevented and the drive member 88 can be rotated to move the driven member 92. This enables relative movement between the first and second members 38, 42 of the support pole 18.

[0049] The canopy deployment mechanism 26 can be coupled with the support pole 18 in any convenient location. In one embodiment, a portion of the canopy deployment mechanism 26 is coupled with the second member 42 adjacent the first lower end 62. In one arrangement a deployment mechanism housing 200 is provided to house a portion of the canopy deployment mechanism 26. In one arrangement, the housing 200, as shown in FIGURE 6, includes a first housing member 200a and a second housing member 200b that can be coupled together in a suitable fashion, e.g., using a suitable a fastener such as a screw. The deployment mechanism housing 200 can be connected to the first end 62 of the second member in any suitable manner, e.g., using rivets 204 or other suitable fasteners. In one embodiment, additional components of the canopy deployment mechanism 26 extend from the first lower end 62 of the second member 42 toward the canopy frame 14, as discussed further below.

[0050] The canopy deployment mechanism 26 can take any suitable form. In one embodiment, the canopy deployment mechanism 26 includes a drum 220 rotatably journaled on the support pole 18. In one embodiment, the drum 220 is journaled on the second member 42. In the embodiment illustrated in FIGURE 6, the drum 220 is journaled in the deployment mechanism housing 200. The drum 220 preferably has a crank engagement portion 224 and is configured to have wound thereabout a tension member 228. In one arrangement, the drum 200 has a radially extending flange 232 and an outer cover

236 between which the tension member 228 can be connected to the drum 220. As discussed above in connection with the extension mechanism 22, a detent coupling 240 can be provided in connection with the crank engagement portion 224.

[0051] The crank engagement portions 136 and 224 are separate. This is advantageous in that such separate placement enables the canopy deployment mechanism and the extension mechanisms to be operated separately. This allows the canopy to be opened fully and extended only as much as needed. The crank engagement portions 136 and 224 preferably are configured such that a single crank handle can be used to operate both mechanisms.

[0052] As discussed further below, winding the tension member 228 on the drum 220 can be facilitated by a ratchet device 241. In one embodiment, the ratchet device 241 includes a rigid member 242 that is configured to engage any of a plurality of surfaces rigidly coupled with the drum 220. In one arrangement, the rigid member 242 is biased into engagement with the ratchet surfaces by a resilient member 243. The resilient member 243 can be a coil spring. The ratchet device 241 is configured to have a first mode wherein rotation of the drum 220 is allowed only in a first direction. In the first mode, the tension member 228 can be wound about the drum 220 as the drum is rotated in the first direction. The tension member 228 will not become inadvertently unwound from the drum 220 because the first mode substantially prevents rotation in a direction opposite the first direction.

[0053] The ratchet device 241 is configured to have a second mode wherein rotation of the drum 220 is allowed in a second direction so that, for example, the tension member 228 can be un-wound from the drum 220. In the second mode, the ratchet device 241 can be said to be disengaged from the drum 220 or from the canopy deployment mechanism 26. In one embodiment, the ratchet device 241 may be disengaged by translating the drum 220 along an axis A3 that extends through the center of the drum 220, e.g., toward the left in FIGURE 6. When slid all the way to the left, the rigid member 242 will not engage a surface of the drum 220 and thus will not prevent rotation thereof in the second direction. The second direction may be opposite the first direction.

[0054] The tension member 228 has a first lower end 244 coupled with the drum 220. In one embodiment, a second upper end 248 of the tension member 228 is coupled with the canopy frame 14, as discussed further below. Between the first and second ends 244, 248, the tension member 228 extends along the support pole structure 18. In one embodiment, the tension member 228 extends within the second member 42, e.g., in the enclosed space 74. In some embodiments, one or more guide members 252 are provided within the enclosed space 74. The tension member 228 slides within the guide member 252, which can be fixed to an internal surface of the second member 42. The guide members 252 can be provided with reduced friction surfaces to ease the operation of the tension member 228. The guide members 252 also cause the tension member 228 to operate at a predetermined location within the second member 42.

[0055] As discussed above, a pivot or hinge portion 272 (FIGURES 2 and 3) is provided between the second member 42 and the canopy frame 14 in some embodiments. This arrangement enables the umbrella 6 to be retracted to a compact arrangement. The hinge portion 272 includes a hinge housing 276 adjacent to the second end 66 of the second member 42. In one embodiment, the hinge housing 276 is mounted on the second end 66 of the second member 42. The hinge housing 276 has a chamber 280 in which an upper portion 284 of the canopy frame 14 can move. A recess 288 is defined by walls within the hinge housing 276 to receive the upper portion 284, as discussed further below.

[0056] In one embodiment, the hinge housing 276 includes a rolling guide portion 292 over which the tension member 228 extends. The rolling guide portion 292 can be a pulley. In some embodiments, a guide member 294 is provided in the second member 42 near the second end 66 to align the tension member 228 with the rolling guide portion 292. The hinge housing 276 also includes a coupler 296 that engages the upper potion 284. In one embodiment, the coupler 296 is rigidly connected to the hinge housing 276 and is configured to support the canopy frame 14 and canopy fabric 12 when the canopy is closed. See FIGURE 3.

[0057] The canopy frame 14 includes an upper central housing 320 through which a central vertical member 324 extends. The central vertical member 324 includes a slot 326 into which the coupler 296 can extend. The central vertical member 324 is able to move within the hinge housing 276 along the slot 326. When the upper end of the slot 326 contacts the coupler 296 (as in FIGURE 3), the canopy frame 14 is supported by the coupler 296. In one embodiment, the coupler 296 moves to a lower end of the slot 326 when the canopy frame 14 is opened, as discussed further below.

[0058] A plurality of ribs 328 can be coupled with the upper central housing 320 at upper ends thereof. The upper central housing 320 is coupled with the central vertical member 324 by a suitable fastener, such as a screw 322. The ribs 328 preferably are pivotably connected to the upper central housing 320 at a joint 330. A lower end portion 420 of at least one of the ribs 328 can be biased to improve the connection of the canopy fabric 12 to the canopy frame 14.

[0059] The upper central housing 320 includes a cap member 336 that is configured to engage or be positioned adjacent to the hinge housing 276. The cap member 336 may be coupled with the upper central housing 320 in any suitable manner, e.g., by a fastener such as a screw 338. The upper central housing 320 also includes a plurality of flanges 340 to which the ribs 328 may be attached. In one arrangement, a cover member 344 is attached to the upper end of the ribs 328 by a rivet 348.

[0060] The canopy frame 14 also includes a lower central housing 366 and a plurality of struts 370 that extend between the lower central housing 366 and the ribs 328 to provide additional structural support for the ribs. The struts 370 are pivotably connected in a suitable manner at both ends with the lower central housing 366 and with the ribs 328.

[0061] The central vertical member 324 has a space 374 defined therein through which the tension member 228 may extend to the lower central housing 366. In one embodiment, a pulley 378 (or other rolling guide member) is mounted in the space 374 and is positioned such that the tension member 228 is guided thereover.

[0062] The canopy may be deployed using the crank handle 80. In particular, the crank handle 80 can be inserted into the crank engagement portion 224 of the canopy deployment mechanism 26. After the crank handle 80 is coupled or engaged with the drum 220, a force applied to the crank handle 80 can be transmitted through the drum 220 to the tension member. For example, the crank handle 80 can be rotated, which rotation is transferred to the drum 220. As the drum 220 rotates, the tension member 228 is wound onto the drum 220. As the tension member is wound onto the drum 220, a tension force is transmitted through the tension member 228 to the canopy frame 14. In particular, a force is transmitted through the tension member 228 to the lower central housing 366. This force is sufficient to cause the lower central housing 366 to move upward relative to the upper central housing 320. As the lower central housing 366 moves toward the upper central housing 320, the struts 370 transmit a force to the ribs 328. This force causes the ribs 328 to spread open to an open configuration. As the ribs 328 are opened the canopy fabric 12 is stretched thereover to provide shelter.

[0063] One advantage of the umbrella 6 and of the umbrellas described below is that they enable extension and retraction of, as well as opening and closing of, a canopy. In particular, the umbrella 6 is configured such that a single crank handle 80 can be used to extend and retract a canopy and to open and close the canopy. By providing a single crank handle 80, the number of components is reduced. Additionally, the crank handle 80 is separable from the rest of the umbrella 6. As such, the crank handle 80 can be removed from the umbrella 6 and stored out of the way. This makes the umbrella 6 more aesthetically pleasing, with fewer parts dangling therefrom.

[0064] As discussed above, the crank handle 80 is engaged with the extension mechanism 22 and is rotated to cause the canopy frame 14 to be extended or retracted relative to a fixed portion of the umbrella 6, e.g., by moving the second member 42 relative to the first member 38. This movement may be facilitated in any suitable manner. FIGURES 7 and 8 illustrate that movement of the second member 42 relative to the first member 38 can be facilitated by providing at least one of a more guide member and a bearing. In one embodiment, a roller bearing 400 is provided that is configured to roll along a surface of the second member 42 as the second member is extended or retracted. In another embodiment, a fixed guide 404 member is provided that is configured to support a surface of the second member 42 as the second member is extended or retracted.

[0065] To make movement of the second member 42 easier (e.g., to reduce the torque needed at the axis A1), the roller bearing 400 and guide member 404 may be made of relatively low friction materials. In one embodiment, the guide member 404 is positioned to slide within the recess 72 formed on the outer surface of the second member 42. The recess 72 acts as a guide track for the guide member 404 in this embodiment. In one embodiment, a plurality of roller bearings 400 is provided. As illustrated in FIGURE 8, one embodiment provides four roller bearings 400. The roller bearings 400 may be equally spaced about the second member 42.

[0066] The bearings 400 and guide member 404 may be mounted to the support pole 18 in any suitable manner. For example, a bearing housing 408 can be provided that is coupled to the first member 38 adjacent to the second end 50 thereof. The bearing housing 408 can take any suitable form. In one arrangement, the bearing housing includes a first portion 408a that is fixed to the second end 50 of the first member 38, e.g., by a screw 412, and a second portion 408b that is removably coupled with the first portion 408a. The second portion 408b can be removably coupled in any suitable manner, e.g., by including threads on an internal surface thereof that mate with external threads on the first portion 408a. In another arrangement, the first and second housing portions 408a, 408b are coupled together with a fastener (not shown).

[0067] FIGURE 8 illustrates the construction of one bearing arrangement. The bearing 400 in one embodiment includes a shaft 416 that is mounted in the first housing portion 408a. A roller 420 is mounted on the shaft 416 and is configured to be able to rotate relative to the first housing portion 408a. An outer surface of the roller 420 contacts a surface of the second member 42. This arrangement reduced friction and enables the second member 42 to move relative to the first member 38 with comparatively less torque being applied by the crank handle 80.

[0068] FIGURE 9 illustrates one arrangement of the umbrella rib 328 that is adjustable at a lower end 420. In the illustrated arrangement, the rib 328 defines a hollow portion 422 adjacent to the lower end 420. A flange 424 is mounted in the hollow portion 422 at a fixed position. The flange 424 can be reinforced by having a first portion 424a that extends transversely to a longitudinal axis of the rib 328 and a second portion 424b that extends parallel to the longitudinal axis of the rib 328 to the lower end thereof. In one embodiment, the flange 424 includes an enlarged ridge 424c that is larger than an opening at the end of the rib 328. This arrangement of the flange 424 is cup-shaped. The ridge 424c helps maintain the position of the flange 424. The flange 424 preferably is

prevented from being pushed fully inside the rib 328. The flange 424 can be mounted in the rib 328 in any suitable manner, e.g., being press-fit or removably mounted, such as with fastener.

[0069] The rib 328 also includes a moveable member 428 that can move relative to the flange 424. Movement of the movable member 428 away from the first portion 424a of the flange 424 tends to elongate the rib 328. Movement of the movable member 428 toward from the first portion 424a of the flange 424 tends to shorten the rib 328. In one arrangement, one end 432 of the movable member 428 is configured to couple with a canopy fabric 12. For example, a fastener 436 can be coupled with the end 432 such that the canopy fabric 12 can be coupled therebetween.

[0070] In one embodiment, the rib 328 also includes a resilient member 440, which can be a coil spring, mounted between the flange 424 and the movable member 428. Where provided, the resilient member 440 advantageously biases the movable member 428 away from the first portion 424a of the flange 424. One benefit of this feature is that as the movable member 428 is biased away from the first portion 424a, a tension force can be applied to a canopy fabric 12 stretched over the canopy frame 14. Such tension force makes the canopy fabric 12 taught, which keeps it from sagging. This is particularly useful when the umbrella is deployed in rain.

Claims

1. An umbrella assembly (10) comprising:

a canopy frame (14);
a support pole structure (18) for said canopy frame (14) comprising:

means for suspending said canopy frame (14), comprising a first curved pole (42) having an upper end (66) coupled with the canopy frame (14);
a second pole (38) supporting said curved pole (42) and having a lower end (58), an upper end (50), and a longitudinal axis, and
a junction adjacent said upper end of said second pole defining a passageway (68) through which the curved pole (42) can be moved generally transversely to the longitudinal axis of the second pole (38);

an extension mechanism (22) coupled with the support pole structure and configured to be driven by a crank to move the curved pole (42) through the passageway to extend or retract the curved pole (42); and
a canopy deployment mechanism (26) coupled with the support pole structure and configured to be driven by a crank (80) of the extension mechanism, to open and close the canopy frame (14);

characterised in that
said means has a lower end (62) which can be retracted to a position where said lower end (62) of said means extends below and beyond the passageway (68).

2. An umbrella comprising:

the umbrella assembly (10) of Claim 1;
a base (8) to which the lower end (58) of the second pole (38) is coupled;
a canopy including the canopy frame (14) and a canopy fabric (12);
the extension mechanism (22) being at least partially housed within an extension mechanism housing (52), the extension mechanism housing (52) being located at the upper end (50) of the second pole (38), the passageway (68) through which the curved pole (42) can be moved being located in the extension mechanism housing (52), the extension mechanism (22) further comprising:

a pinion gear (88) mounted in the extension mechanism housing (52) to rotate about an axis extending generally transversely to the longitudinal axis of the second pole (38); and
a rack (92) coupled with the curved pole (42) and configured to be driven by the pinion gear (88) such that rotation of the pinion gear (88) is converted to translation of the curved pole (42) within the passageway (68); and

a canopy deployment mechanism (26) coupled with the support pole structure adjacent the lower end (62) of the curved pole (42), the canopy deployment mechanism (26) comprising:

a shaft mounted adjacent to the enclosed space of the curved pole (42);
a tension member (228) having a first lower end (244) coupled with the shaft and a second upper end (248) coupled with the canopy frame (14);
a crank (80) configured to engage the extension mechanism (22) and the canopy deployment mechanism (26).

3. The umbrella of Claim 2, further comprising a gear shaft (128) journaled in the extension mechanism housing (52) on which the pinion gear (88) is mounted.

4. The umbrella of either Claim 2 or Claim 3, wherein the canopy deployment mechanism (26) further comprises a ratchet device (241) and a drum (220) mounted on the shaft and coupled with the lower end (244) of the tension member, the ratchet device (241) configured to engage the drum (220) to selectively prevent the drum (220) and the shaft from rotating.

5. The umbrella of any one of Claims 2-4, wherein the canopy frame (14) further comprises at least one rib (328) having an upper end, a lower end (420), and a movable member (428), the movable member (428) being movably coupled with the lower end (420) such that the length of the rib (328) can be increased.

6. The umbrella of Claim 5, wherein the rib (328) further comprises a resilient member (440) within a passageway configured to urge the movable member (420) toward a lower end of the passageway.

7. The umbrella of any one of Claims 2-6, further comprising a brake system (168) comprising a resilient member (170) configured to engage the extension mechanism housing (52) and a brake engagement member (178) coupled with the crank (80), the brake engagement member (178) configured to compress the resilient member (140) by rotation of the crank (80) to disengage the resilient member (170) from the extension mechanism housing (52).

8. The umbrella assembly of Claim 1, further comprising a brake system (168) configured to limit movement of the curved pole (42) relative to the second pole (38).

9. The umbrella assembly (10) of either Claim 1 or Claim 8, further comprising a base (8) coupled with the lower end (58) of the second pole (38).

10. The umbrella assembly (10) of any one of Claims 1, 8-9, wherein the canopy deployment mechanism (26) further comprises:

a drum (220) rotatably journaled on the support pole structure (18), the drum (220) having a crank engagement portion (224);
a tension member (228) having a first lower end (244) coupled with the drum (220) and a second upper end (248) coupled with the canopy frame (14);
a ratchet device (241) that engages the drum (220) to selectively prevent rotation of the drum (220); and
a crank (80) configured to engage the crank engagement portion (224) such that a force applied to the crank (80) rotates the drum (220) whereby a force is applied to the tension member (228), the force being transmitted by the tension member (228) to the canopy frame (14) to cause the canopy frame (14) to open and close.

11. The umbrella assembly (10) of any one of Claims 1, 8-10 further comprising a hinge (272) located between the canopy frame (14) and the curved pole of the support pole structure, the hinge (272) enabling a central portion of the canopy frame (14) to extend generally perpendicular to the curved pole when the canopy is open and to hang adjacent to the curved pole when the canopy is closed.

12. The umbrella assembly (10) of any one of Claims 1, 8-11, further comprising a canopy fabric (12) coupled with an upper portion of the canopy frame (14).

13. The umbrella assembly (10) of any one of Claims 1, 8-12, wherein the canopy frame (14) further comprises at least one rib (328) having an upper end, a lower end (420), and a movable member (428), the movable member (428) being movably coupled with the lower end (420) such that the length of the rib (328) can be increased.

14. The umbrella assembly (10) of Claim 13, wherein the rib (328) further comprises a resilient member (440) within passage configured to urge the movable member (428) toward a lower end of the passage.

15. The umbrella assembly (10) of any one of Claims 1,8-14, further comprising a crank (80) handle capable of driving the canopy deployment mechanism (26) and the extension mechanism (22).

16. The umbrella assembly (10) of any one of Claims 1, 8-15, wherein the curved pole (42) comprises a recess (72) configured to house at least a portion of the extension mechanism (22).

17. The umbrella assembly (10) of any one of Claims 1, 8-16, wherein the extension mechanism (22) further comprises a driven member (92) coupled with the curved pole (42) and facing a surface defining the passage in the second pole (38).

18. The umbrella assembly (10) of any one of Claims 1, 8-17, wherein the extension mechanism (22) further comprises:

a driven member (92) coupled with the curved pole (42) and facing the junction; and
a drive member (88) configured to apply a force to driven member in response to rotation of a crank (80) whereby the curved pole (42) can be moved relative to the second pole (38).

19. The umbrella assembly (10) of Claim 18, wherein

the driven member (92) comprises a plurality of gear teeth.

20. The umbrella assembly (10) of either Claim 18 or Claim 19, wherein the driven member (92) comprises a gear rack.

21. The umbrella assembly (10) of any one of Claims 18-20, wherein the drive member (88) comprises a pinion gear.

22. The umbrella assembly (10) of any one of Claims 18-21, wherein the junction further comprises an extension mechanism housing (52) coupled with the second pole (38).

23. The umbrella assembly (10) of any one of Claims 18-22, wherein the curved pole (42) comprises a passage and the canopy deployment mechanism (26) comprises a tension member (228) extending through the passage to an end of the curved pole (42).

24. The umbrella assembly (10) of Claim 23, wherein the canopy deployment mechanism (26) comprises a crank (80) and a drum (220) coupled with the crank (80) and the tension member (228), wherein rotation of the crank (80) winds the tension member (228) onto or unwinds the tension member (228) from the drum (220).

25. The umbrella assembly (10) of any one of Claims 1, 8-24, wherein the canopy deployment mechanism (26) is configured to be driven independently of the extension mechanism (22).

26. The umbrella assembly (10) of any one of Claims 1, 8-25, wherein said at least a portion of said canopy deployment mechanism (26) has a lower end which can be retracted to a position where said portion of said canopy deployment mechanism (26) extends below and beyond the passageway (68).

27. The umbrella assembly (10) of any one of Claims 1, 8-26, wherein the junction is substantially shorter than the curved pole (42), and wherein when the curved pole (42) is fully retracted the lower end of the means is adjacent to the lower portion of the second pole such that the umbrella has a compact arrangement.

Patentansprüche

1. Schirmbaugruppe (10), die Folgendes umfasst:

ein Schirmkappengestell (14),
eine Stützstangenstruktur (18) für das Schirmkappengestell (14), die Folgendes umfasst:

- Mittel zum Aufhängen des Schirmkappengestells (14), die eine erste gekrümmte Stange (42) umfassen, die ein oberes Ende (66) hat, das mit dem Schirmkappengestell (14) gekoppelt ist,
- eine zweite Stange (38), welche die gekrümmte Stange (42) stützt und ein unteres Ende (58), ein oberes Ende (50) und eine Längsachse und eine Verbindungsstelle, angrenzend an das obere Ende der zweiten Stange, hat, die einen Durchgang (68) definiert, durch den die gekrümmte Stange (42) im Allgemeinen quer zu der Längsachse der zweiten Stange (38) bewegt werden kann;

einen Ausfahrmechanismus (22), der mit der Stützstangenstruktur gekoppelt und dafür konfiguriert ist, durch eine Kurbel angetrieben zu werden, um die gekrümmte Stange (42) durch den Durchgang zu bewegen, um die gekrümmte Stange (42) auszufahren oder einzuziehen, und
einen Schirmkappen-Entfaltungsmechanismus (26), der mit der Stützstangenstruktur gekoppelt und dafür konfiguriert ist, durch eine Kurbel (80) des Ausfahrmechanismus angetrieben zu werden, um das Schirmkappengestell (14) zu öffnen und zu schließen,

dadurch gekennzeichnet, dass das Mittel ein unteres Ende (62) hat, das zu einer Stellung eingezogen werden kann, wobei sich das untere Ende (62) des Mittels unterhalb und jenseits des Durchgangs (68) erstreckt.

2. Schirm, der Folgendes umfasst:

die Schirmbaugruppe (10) nach Anspruch 1,
eine Basis (8), an die das untere Ende (58) der zweiten Stange (38) gekoppelt ist,
eine Schirmkappe, die das Schirmkappengestell (14) und ein Schirmkappengewebe (12) einschließt,
wobei der Ausfahrmechanismus (22) wenigstens teilweise innerhalb eines Ausfahrmechanismusgehäuses (52) untergebracht ist, wobei das Ausfahrmechanismusgehäuse (52) an dem oberen Ende (50) der zweiten Stange (38) angeordnet ist, wobei der Durchgang (68), durch den die gekrümmte Stange (42) bewegt werden kann, in dem Ausfahrmechanismusgehäuse (52) angeordnet ist, wobei der Ausfahrmechanismus (22) ferner Folgendes umfasst:

- ein Ritzel (88), das in dem Ausfahrmechanismusgehäuse (52) angebracht ist, um

sich um eine Achse zu drehen, die sich im Allgemeinen quer zu der Längsachse der zweiten Stange (38) erstreckt, und
- eine Zahnstange (92), die mit der gekrümmten Stange (42) gekoppelt und dafür konfiguriert ist, durch das Ritzel (88) angetrieben zu werden derart, dass die Drehung des Ritzels (88) in eine Translationsbewegung der gekrümmten Stange (42) innerhalb des Durchgangs umgewandelt wird, und

einen Schirmkappen-Entfaltungsmechanismus (26), der angrenzend an das untere Ende (62) der gekrümmten Stange (42) mit der Stützstangenstruktur gekoppelt ist, wobei der Schirmkappen-Entfaltungsmechanismus (26) Folgendes umfasst:

- eine Welle, die angrenzend an den eingeschlossenen Raum der gekrümmten Stange (42) angebracht ist,
- ein Spannungselement (228), das ein erstes, unteres Ende (244), das mit der Welle gekoppelt ist, und ein zweites, oberes Ende (248), das mit dem Schirmkappengestell (14) gekoppelt ist, hat,
- eine Kurbel (80), die dafür konfiguriert ist, den Ausfahrmechanismus (22) und den Schirmkappen- Entfaltungsmechanismus (26) in Eingriff zu nehmen.

3. Schirm nach Anspruch 2, der ferner eine in dem Ausfahrmechanismusgehäuse (52) gelagerte Getriebewelle (128) umfasst, an der das Ritzel (88) angebracht ist.

4. Schirm nach Anspruch 2 oder Anspruch 3, wobei der Schirmkappen-Entfaltungsmechanismus (26) ferner eine Sperrklinkeneinrichtung (241) und eine Trommel (220), die an der Welle angebracht und mit dem unteren Ende (244) des Spannungselements gekoppelt ist, umfasst, wobei die Sperrklinkeneinrichtung (241) dafür konfiguriert ist, die Trommel (220) in Eingriff zu nehmen, um die Trommel (220) und die Welle selektiv am Drehen zu hindern.

5. Schirm nach einem der Ansprüche 2 bis 4, wobei das Schirmkppengestell (14) ferner wenigstens eine Rippe (328) umfasst, die ein oberes Ende, ein unteres Ende (420) und ein bewegliches Element (428) hat, wobei das bewegliche Element (428) beweglich mit dem unteren Ende (420) gekoppelt ist derart, dass die Länge der Rippe (328) gesteigert werden kann.

6. Schirm nach Anspruch 5, wobei die Rippe (328) ferner ein elastisches Element (440) innerhalb eines Durchgangs umfasst, das dafür konfiguriert ist, das bewegliche Element (428) zu einem unteren Ende des Durchgangs hin zu drängen.

7. Schirm nach einem der Ansprüche 2 bis 6, der ferner ein Bremssystem (168) umfasst, das ein elastisches Element (170), das dafür konfiguriert ist, das Ausfahrmechanismusgehäuse (52) in Eingriff zu nehmen, und ein Bremseingriffselement (178), das mit der Kurbel (80) gekoppelt ist, umfasst, wobei das Bremseingriffselement (178) dafür konfiguriert ist, das elastische Element (170) durch Drehen der Kurbel (80) zusammenzudrücken, um das elastische Element (170) von dem Ausfahrmechanismusgehäuse (52) auszurücken.

8. Schirmbaugruppe nach Anspruch 1, die ferner ein Bremssystem (168) umfasst, das dafür konfiguriert ist, die Bewegung der gekrümmten Stange (42) im Verhältnis zu der zweiten Stange (38) zu begrenzen.

9. Schirmbaugruppe (10) nach Anspruch 1 oder Anspruch 8, die ferner eine Basis (8) umfasst, die mit dem unteren Ende (58) der zweiten Stange (38) gekoppelt ist.

10. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 9, wobei der Schirmkappen-Entfaltungsmechanismus (26) ferner Folgendes umfasst:

- eine Trommel (220), die drehbar an der Stützstangenstruktur (18) gelagert ist, wobei die Trommel (220) einen Kurbeleingriffsabschnitt (224) hat,
- ein Spannungselement (228), das ein erstes, unteres Ende (244), das mit der Trommel (220) gekoppelt ist, und ein zweites, oberes Ende (248), das mit dem Schirmkappengestell (14) gekoppelt ist, hat,
- eine Sperrklinkeneinrichtung (241), welche die Trommel (220) in Eingriff nimmt, um selektiv ein Drehen der Trommel (220) zu verhindern, und
- eine Kurbel (80), die dafür konfiguriert ist, den Kurbeleingriffsabschnitt (224) in Eingriff zu nehmen derart, dass eine auf die Kurbel (80) ausgeübte Kraft die Trommel (220) dreht, wodurch eine Kraft auf das Spannungselement (228) ausgeübt wird, wobei die Kraft durch das Spannungselement (228) auf das Schirmkappengestell (14) übertragen wird, um zu bewirken, dass sich das Schirmkappengestell (14) öffnet und schließt.

11. Schirmbaugruppe (10)- nach einem der Ansprüche 1, 8 bis 10, die ferner ein Scharnier (272) umfasst, das zwischen dem Schirmkappengestell (14) und der gekrümmten Stange der Stützstangenstruktur angeordnet ist, wobei das Scharnier (272) ermög-

licht, dass ein Mittelabschnitt des Schirmkappengestells (14) sich im Allgemeinen senkrecht zu der gekrümmten Stange erstreckt, wenn die Schirmkappe offen ist, und angrenzend an die gekrümmte Stange hängt, wenn die Schirmkappe geschlossen ist.

12. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 11, die ferner ein Schirmkappengewebe (12) umfasst, das mit einem oberen Abschnitt des Schirmkappengestells (14) gekoppelt ist.

13. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 12, wobei das Schirmkappengestell (14) ferner wenigstens eine Rippe (328) umfasst, die ein oberes Ende, ein unteres Ende (420) und ein bewegliches Element (428) hat, wobei das bewegliche Element (428) beweglich mit dem unteren Ende (420) gekoppelt ist derart, dass die Länge der Rippe (328) gesteigert werden kann.

14. Schirmbaugruppe (10) nach Anspruch 13, wobei die Rippe (328) ferner ein elastisches Element (440) innerhalb eines Durchgangs umfasst, das dafür konfiguriert ist, das bewegliche Element (428) zu einem unteren Ende des Durchgangs hin zu drängen.

15. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 14, die ferner einen Kurbelgriff umfasst, der dazu in der Lage ist, den Schirmkappen-Entfaltungsmechanismus (26) und den Ausfahrmechanismus (22) anzutreiben.

16. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 15, wobei die gekrümmte Stange (42) eine Aussparung (72) umfasst, die dafür konfiguriert ist, wenigstens einen Abschnitt des Ausfahrmechanismus (22) unterzubringen.

17. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 16, wobei der Ausfährmechanismus (22) ferner ein Abtriebselement (92) umfasst, das mit der gekrümmten Stange (42) gekoppelt ist und einer Fläche gegenüberliegt, die den Durchgang in der zweiten Stange (38) definiert.

18. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 17, wobei der Ausfahrmechanismus (22) ferner Folgendes umfasst:

- ein Abtriebselement (92), das mit der gekrümmten Stange (42) gekoppelt ist und der Verbindungsstelle gegenüberliegt, und
- ein Antriebselement (88), das dafür konfiguriert ist, als Reaktion auf ein Drehen einer Kurbel (80) eine Kraft auf das Abtriebselement auszuüben, wodurch die gekrümmte Stange (42) im Verhältnis zu der zweiten Stange (38) bewegt werden kann.

19. Schirmbaugruppe (10) nach Anspruch 18, wobei das Abtriebselement (92) mehrere Getriebezähne umfasst.

20. Schirmbaugruppe (10) nach Anspruch 18 oder Anspruch 19, wobei das Abtriebselement (92) eine Getriebezahnstange umfasst.

21. Schirmbaugruppe (10) nach einem der Ansprüche 18 bis 20, wobei das Abtriebselement (92) ein Ritzel umfasst.

22. Schirmbaugruppe (10) nach einem der Ansprüche 18 bis 21, wobei die Verbindungsstelle ferner ein Ausfahrmechanismusgehäuse (52) umfasst, das mit der zweiten Stange (38) gekoppelt ist.

23. Schirmbaugruppe (10) nach einem der Ansprüche 18 bis 22, wobei die gekrümmte Stange (42) einen Durchgang umfasst und der Schirmkappen-Entfaltungsmechanismus (26) ein Spannungselement (228) umfasst, das sich durch den Durchgang bis zu einem Ende der gekrümmten Stange (42) erstreckt.

24. Schirmbaugruppe (10) nach Anspruch 23, wobei der Schirmkappen-Entfaltungsmechanismus (26) eine Kurbel (80) und eine mit der Kurbel (80) und dem Spannungselement (228) gekoppelte Trommel (220) umfasst, wobei ein Drehen der Kurbel (80) das Spannungselement (228) auf die Trommel (220) aufwickelt oder das Spannungselement (228) von derselben abwickelt.

25. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 24, wobei der Schirmkappen-Entfaltungsmechanismus (26) dafür konfiguriert ist, unabhängig von dem Ausfahrmechanismus (22) angetrieben zu werden.

26. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 25, wobei wenigstens ein Abschnitt des Schirmkappen-Entfaltungsmechanismus (26) ein unteres Ende hat, das bis zu einer Stellung eingezogen werden kann, in der sich der Abschnitt des Schirmkappen-Antfaltungsmechanismus (26) unterhalb und jenseits des Durchgangs (68) erstreckt.

27. Schirmbaugruppe (10) nach einem der Ansprüche 1, 8 bis 26, wobei die Verbindungsstelle wesentlich kürzer ist als die gekrümmte Stange (42) und wobei, wenn die gekrümmte Stange (42) vollständig eingezogen ist, das untere Ende des Mittels an den unteren Abschnitt der zweiten Stange angrenzt derart, dass der Schirm eine kompakte Anordnung hat.

Revendications

1. Ensemble parasol (10), comprenant :

un cadre d'auvent (14) ;
une structure de bras de support (18) pour ledit cadre d'auvent (14), comprenant :

- en moyen pour suspendre ledit cadre d'auvent (14), comprenant un premier bras recourbé (42) ayant une extrémité supérieure (66) couplée au cadre d'auvent (14) ;
- un deuxième bras (38) supportant ledit bras recourbé (42) et ayant une extrémité inférieure (58), une extrémité supérieure (50), et un axe longitudinal, et une jonction adjacente à ladite extrémité supérieure dudit deuxième bras définissant un passage (68) à travers lequel le bras recourbé (42) peut être déplacé de manière généralement transversale par rapport à l'axe longitudinal du deuxième bras (38);

un mécanisme d'extension (22) couplé à la structure de bras de support et configuré pour être entraîné par une manivelle pour déplacer le bras courbé (42) à travers le passage pour déployer ou rétracter le bras recourbé (42) ; et
un mécanisme de déploiement de l'auvent (26) couplé à la structure de bras de support et configuré pour être entraîné par une manivelle (80) du mécanisme d'extension, pour ouvrir et fermer le cadre d'auvent (14) ;

caractérisé en ce que ledit moyen a une extrémité inférieure (62) qui peut être rétractée à une position où ladite extrémité inférieure (62) dudit moyen se déploie en dessous et au-delà du passage (68).

2. Parasol, comprenant :

l'ensemble parasol (10) de la revendication 1 ;
une base (8) à laquelle l'extrémité inférieure (58) du deuxième bras (38) est couplée ;
un auvent incluant le cadre d'auvent (14) et une étoffe d'auvent (12) ;
le mécanisme d'extension (22) étant au moins partiellement logé dans un boîtier de mécanisme d'extension (52), le boîtier de mécanisme d'extension (52) étant situé à l'extrémité supérieure (50) du deuxième bras (38), le passage (68) à travers lequel le bras recourbé (42) peut être déplacé étant situé dans le boîtier du mécanisme d'extension (52), le mécanisme d'extension (22) comprenant en outre :

un engrenage à pignons (88) monté dans le boîtier du mécanisme d'extension (52) pour pivoter sur un axe s'étendant généralement de manière transversale par rapport à l'axe longitudinal du deuxième bras (38) ; et
une crémaillère (92) couplée au bras recourbé (42) et configurée pour être entraînée par l'engrenage (88) de sorte que la rotation de l'engrenage (88) est convertie en une translation du bras recourbé (42) dans le passage (68) ; et
un mécanisme de déploiement de l'auvent (26) couplé à la structure de bras de support à proximité de l'extrémité inférieure (62) du bras recourbé (42), le mécanisme de déploiement de l'auvent (26) comprenant :

- un arbre monté à proximité de l'espace clos du bras recourbé (42) ;
- un élément de tension (228) ayant une première extrémité inférieure (244) couplée à l'arbre et une deuxième extrémité supérieure (248) couplée au cadre d'auvent (14) ;
- une manivelle (80) configurée pour s'engager dans le mécanisme d'extension (22) et dans le mécanisme de déploiement de l'auvent (26).

3. Parasol selon la revendication 2, comprenant en outre un arbre de transmission (128) tourillonné dans le boîtier du mécanisme d'extension (52) sur lequel l'engrenage (88) à pignons est monté.

4. Parasol selon la revendication 2 ou 3, dans lequel le mécanisme de déploiement de l'auvent (26) comprend en outre un cliquet (241) et un cylindre (220) monté sur l'arbre et couplé à l'extrémité inférieure (244) de l'élément de tension, le cliquet (241) étant configuré pour s'engager dans le cylindre (220) pour empêcher sélectivement le cylindre (220) et l'arbre de pivoter.

5. Parasol selon l'une quelconque des revendications 2 à 4, dans lequel le cadre de l'auvent (14) comprend en outre au moins un baleine (328) ayant une extrémité supérieure, une extrémité inférieure (420), et un élément déplaçable (428), l'élément déplaçable (428) étant couplé de façon mobile avec l'extrémité inférieure (420) de sorte que la longueur de la baleine (328) peut être augmentée.

6. Parasol selon la revendication 5, dans lequel le baleine (328) comprend en outre un élément élastique (440) dans un passage configuré pour pousser l'élément déplaçable (428) vers une extrémité inférieure du passage.

7. Parasol selon l'une quelconque des revendications

2 à 6, qui comprend en plus un système de frein (168) comprenant un élément élastique (170) configuré pour s'engager dans le boîtier du mécanisme d'extension (52) et un élément d'engagement de frein (178) couplé à la manivelle (80), l'élément d'engagement de frein (178) étant configuré pour compresser l'élément élastique (170) par rotation de la manivelle (80) pour désengager l'élément élastique (170) du boîtier de mécanisme d'extension (52).

8. Ensemble de parasol selon la revendication 1, comprenant en outre un système de frein (168) configuré pour limiter le mouvement du bras recourbé (42) par rapport au deuxième bras (38).

9. Ensemble de parasol (10) selon la revendication 1 ou 8, comprenant en outre une base (8) couplée à l'extrémité inférieure (58) du deuxième bras (38).

10. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 9, dans lequel le mécanisme de déploiement de l'auvent (26) comprend en outre :

un cylindre (220) tourillonné rotativement sur la structure de bras de support (18), le cylindre (220) ayant une portion d'engagement dans la manivelle (224) ;
un élément de tension (228) ayant une première extrémité inférieure (244) couplée au cylindre (220) et une deuxième extrémité supérieure (248) couplée au cadre d'auvent (14) ;
un cliquet (241) qui s'engage dans le cylindre (220) pour empêcher sélectivement la rotation du cylindre (220) ; et
une manivelle (80) configurée pour s'engager dans la portion d'engagement de la manivelle (224) de sorte qu'une force appliquée à la manivelle (80) fait tourner le cylindre (220), une force étant appliquée à l'élément de tension (228), la force étant transmise par l'élément de tension (228) au cadre d'auvent (14) pour entraîner l'ouverture et la fermeture du cadre d'auvent (14).

11. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 10, comprenant en outre une charnière (272) située entre le cadre d'auvent (14) et le bras recourbé de la structure de support, la charnière (272) permettant à la portion centrale de la structure d'auvent (14) de s'étendre de manière généralement perpendiculaire au bras recourbé quand l'auvent est ouvert, et de pendre à proximité du bras recourbé quand l'auvent est refermé.

12. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 11, comprenant en outre une étoffe d'auvent (12) couplée à une portion supérieure du cadre d'auvent (14).

13. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 12, dans lequel le cadre d'auvent (14) comprend en outre au moins un baleine (328) ayant une extrémité supérieure, une extrémité inférieure (420) et un élément mobile (428), l'élément mobile (428) étant couplé de manière mobile à l'extrémité inférieure (420) de sorte que la longueur de la baleine (328) peut être augmentée.

14. Ensemble de parasol (10) selon la revendication 13, dans lequel la baleine (328) comprend en outre un élément élastique (440) dans un passage configuré pour pousser l'élément mobile (428) vers une extrémité inférieure du passage.

15. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 14, comprenant en outre un manche de manivelle capable d'entraîner le mécanisme de déploiement de l'auvent (26) et le mécanisme d'extension (22).

16. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 15, dans lequel le bras recourbé (42) comprend un évidemment (72) pour y loger au moins une portion du mécanisme d'extension (22).

17. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 16, dans lequel le mécanisme d'extension (22) comprend en outre un élément d'entraînement (92) couplé au bras recourbé (42) et faisant face à une surface définissant le passage dans le deuxième bras (38).

18. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 17, dans lequel le mécanisme d'extension (22) comprend en outre :

un élément moteur (92) couplé au bras recourbé (42) et faisant face à la jonction ; et
un élément récepteur (88) configuré pour appliquer une force à l'élément moteur en réponse à la rotation d'une manivelle (80), le bras recourbé (42) pouvant être déplacé par rapport au deuxième bras (38).

19. Ensemble de parasol (10) selon la revendication 18, dans lequel l'élément récepteur (92) comprend une pluralité de dents d'engrenage.

20. Ensemble de parasol (10) selon la revendication 18 ou 19, dans lequel l'élément récepteur (92) comprend une crémaillère à engrenage.

21. Ensemble de parasol (10) selon l'une quelconque des revendications 18 à 20, dans lequel l'élément

moteur (88) comprend un engrenage.

22. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 21, dans lequel la jonction comprend en outre un boîtier de mécanisme d'extension (52) couplé au deuxième bras (38).

23. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 22, dans lequel le bras recourbé (42) comprend un passage et le mécanisme de déploiement de l'auvent (26) comprend un élément de tension (228) s'étendant à travers le passage vers une extrémité du bras recourbé (42).

24. Ensemble de parasol (10) selon la revendication 23, dans lequel le mécanisme de déploiement de l'auvent (26) comprend une manivelle (80) et un cylindre (220) couplé à la manivelle (80) et à l'élément de tension (228), la rotation de la manivelle (80) enroulant l'élément de tension (228) sur le cylindre (220) ou déroulant l'élément de tension à partir du cylindre (220).

25. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 24, dans lequel le mécanisme de déploiement de l'auvent (26) est configuré pour être entraîné indépendamment du mécanisme d'extension (22).

26. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 25, dans lequel au moins une portion dudit mécanisme de déploiement de l'auvent (26) a une extrémité inférieure qui peut être rétractée jusqu'à une position où ladite portion dudit mécanisme de déploiement de l'auvent (26) s'étend en dessous et au-delà du passage (68).

27. Ensemble de parasol (10) selon l'une quelconque des revendications 1, 8 à 26, dans lequel la jonction est substantiellement plus courte que le bras recourbé (42), et dans lequel, quand le bras recourbé (42) est complètement rétracté, l'extrémité inférieure du moyen est adjacente à la portion inférieure du deuxième bras de sorte que le parasol a un arrangement compact.

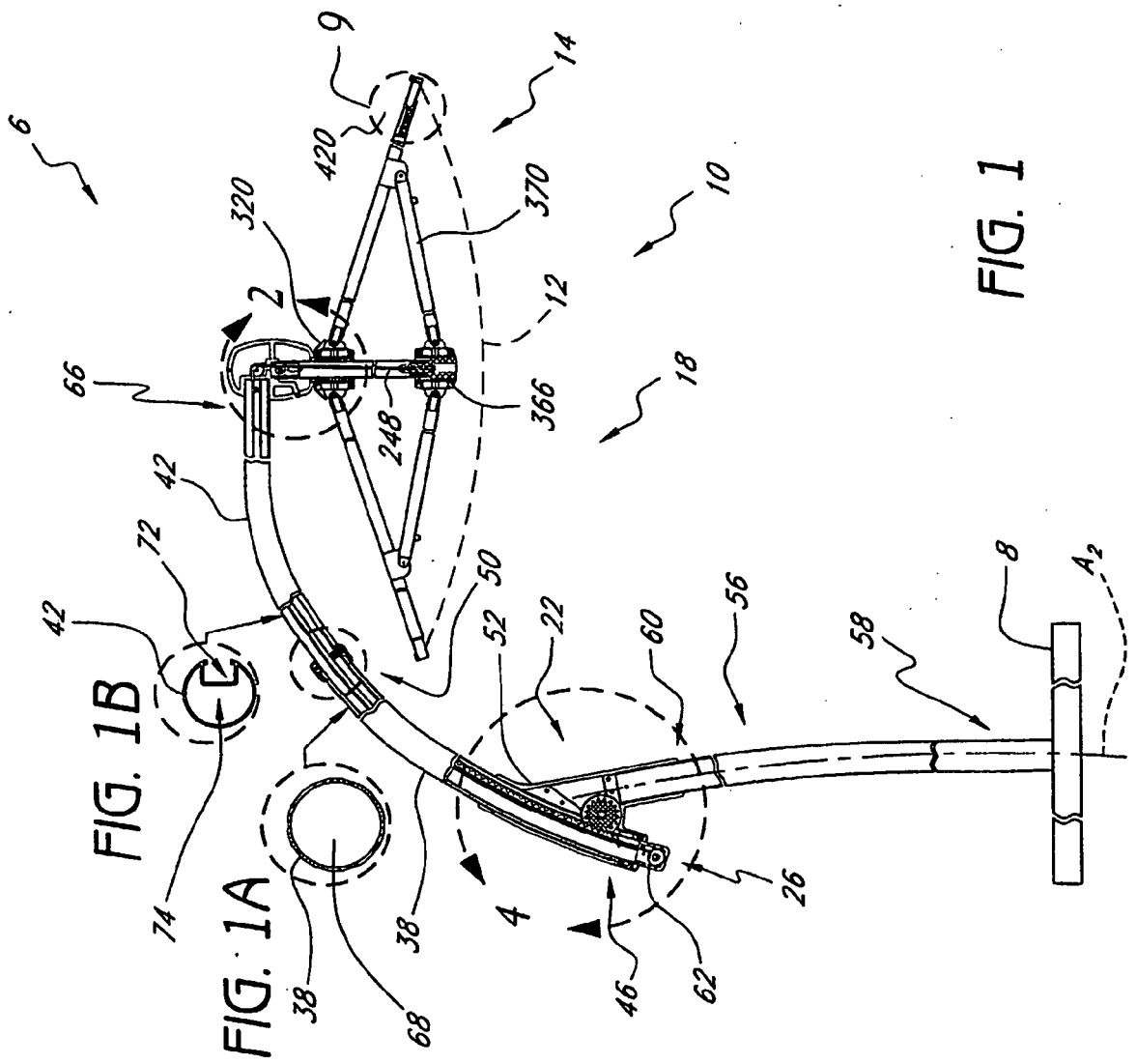
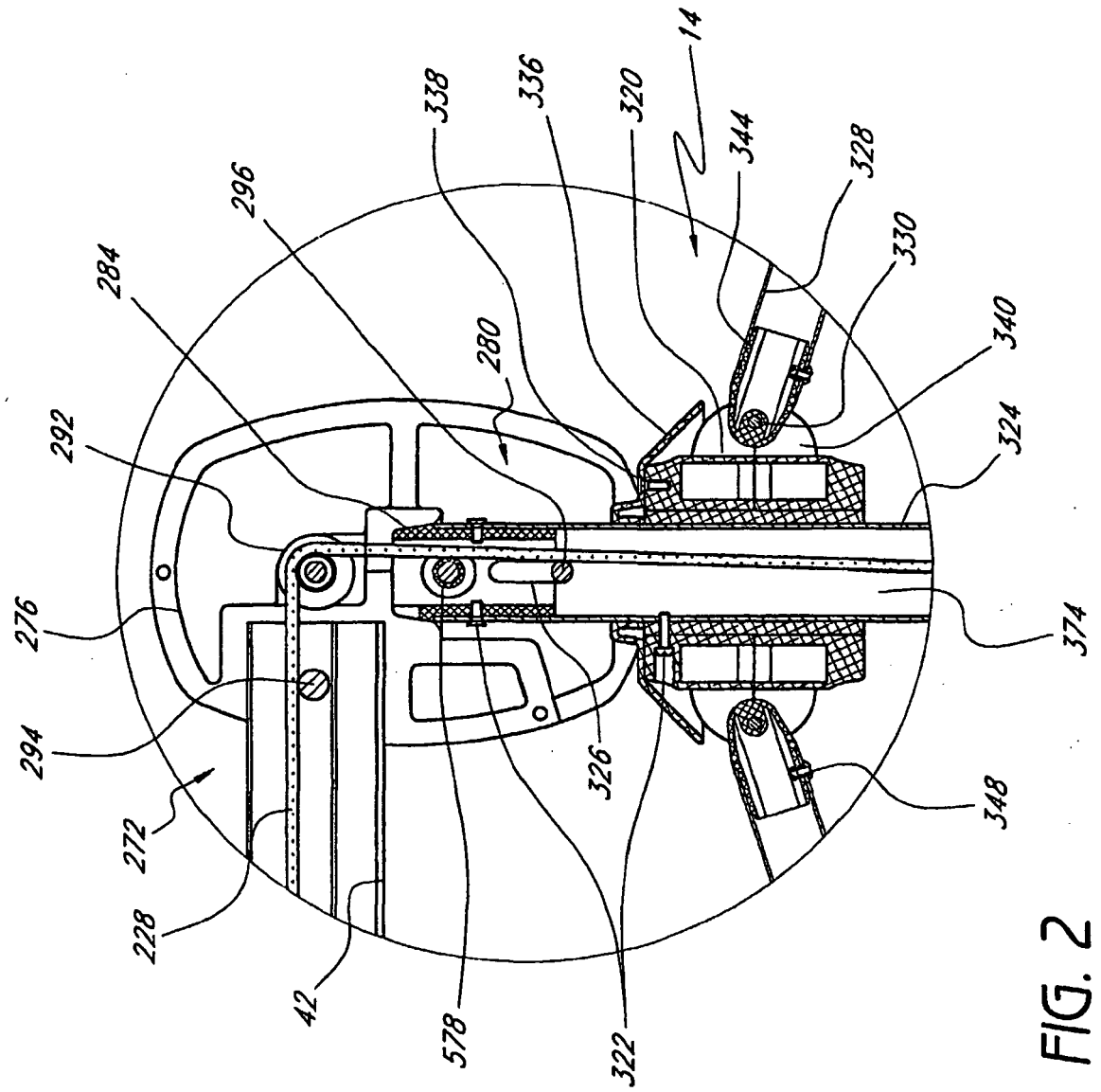


FIG. 1B

FIG. 1A

FIG. 1


14
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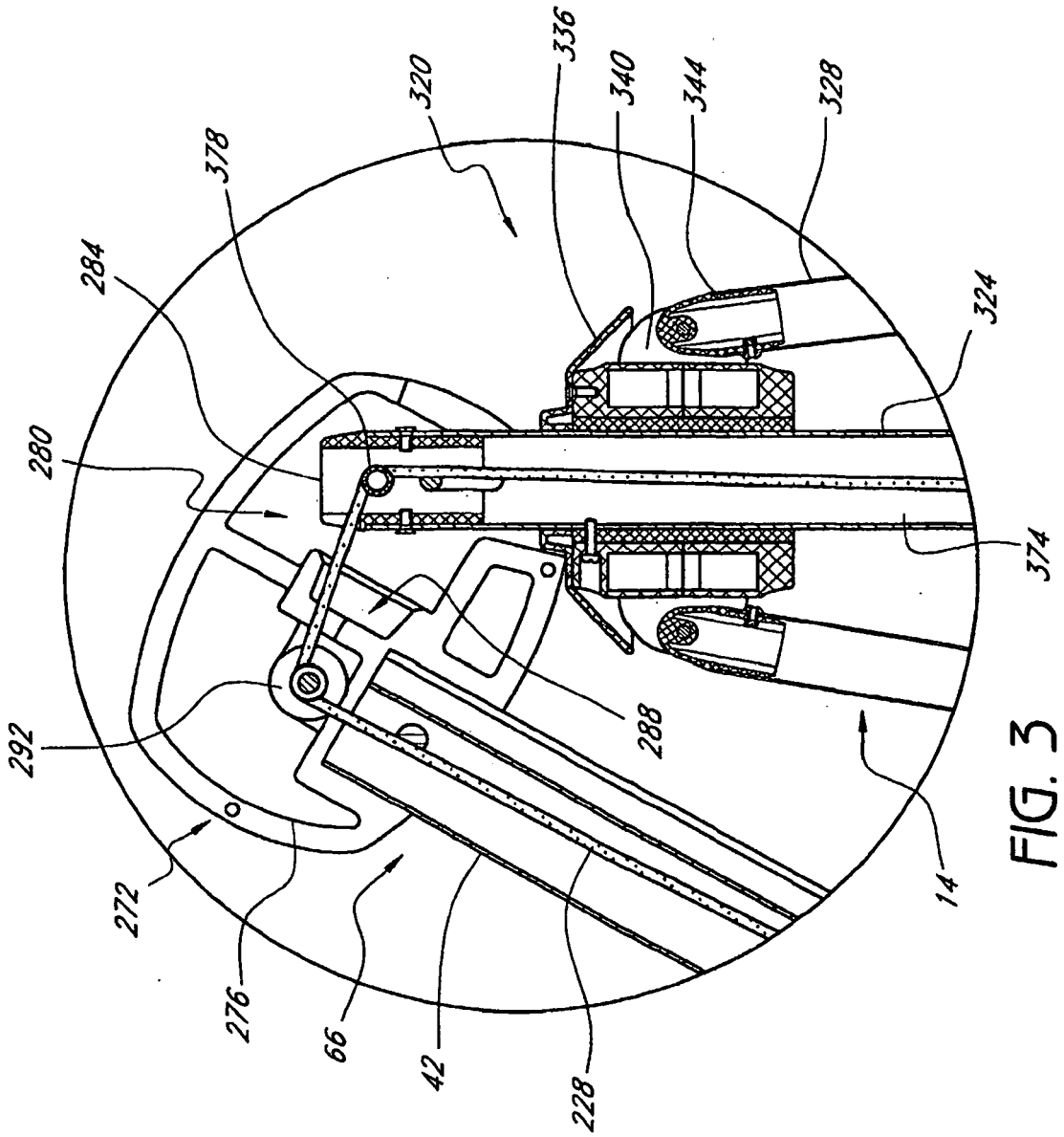
578
322

FIG. 2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42
228
14

FIG. 3

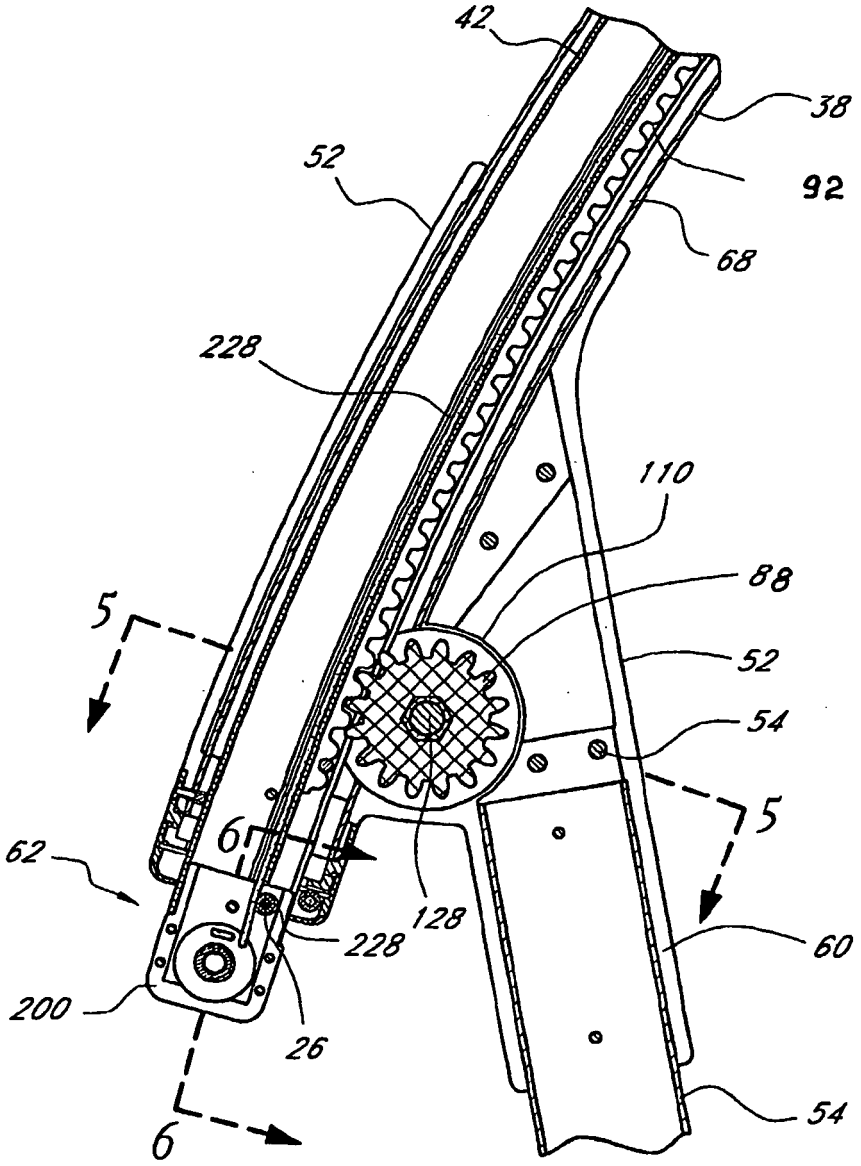
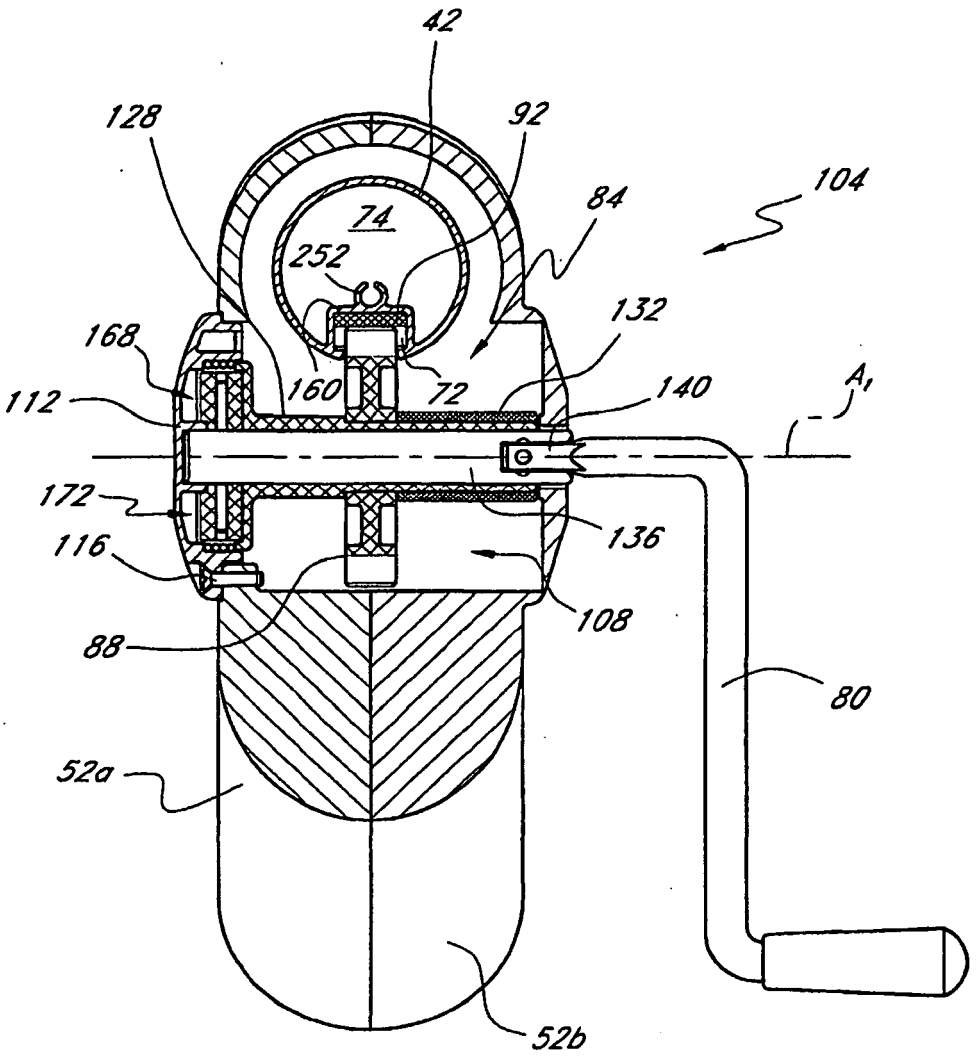


FIG. 4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128
92
104
74
84
252
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168
160
72
140
A1
112
172
136
116
108
88
80
52a
52b

FIG. 5

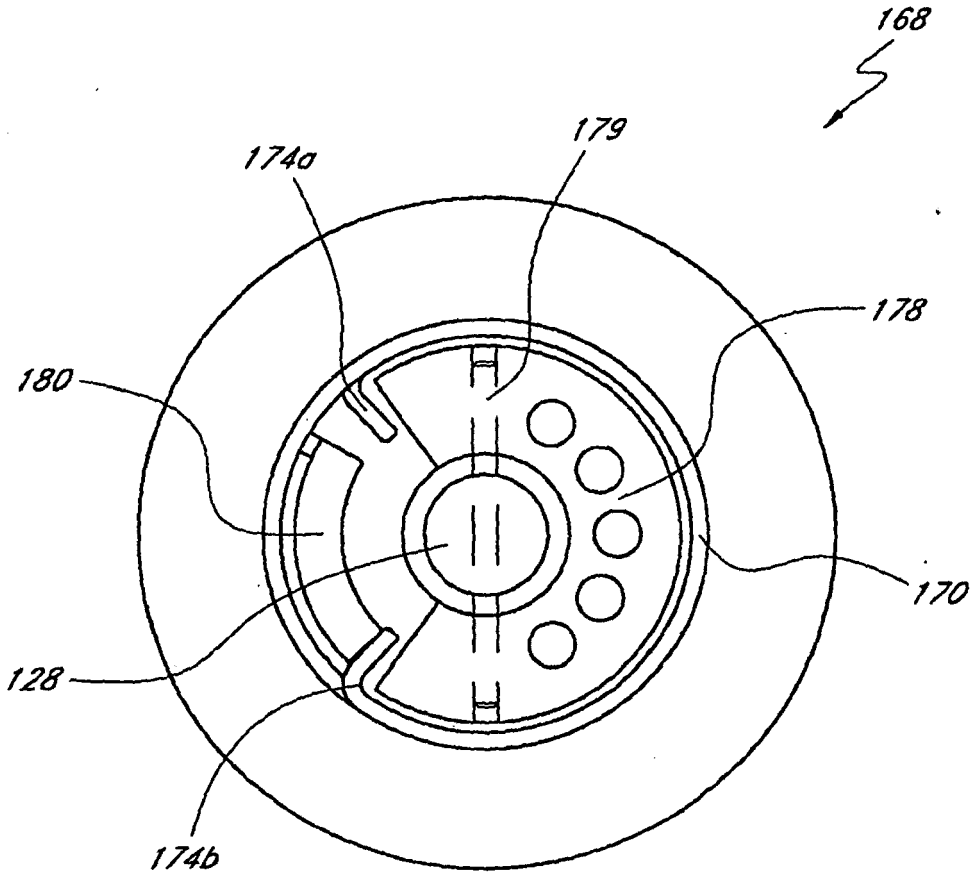
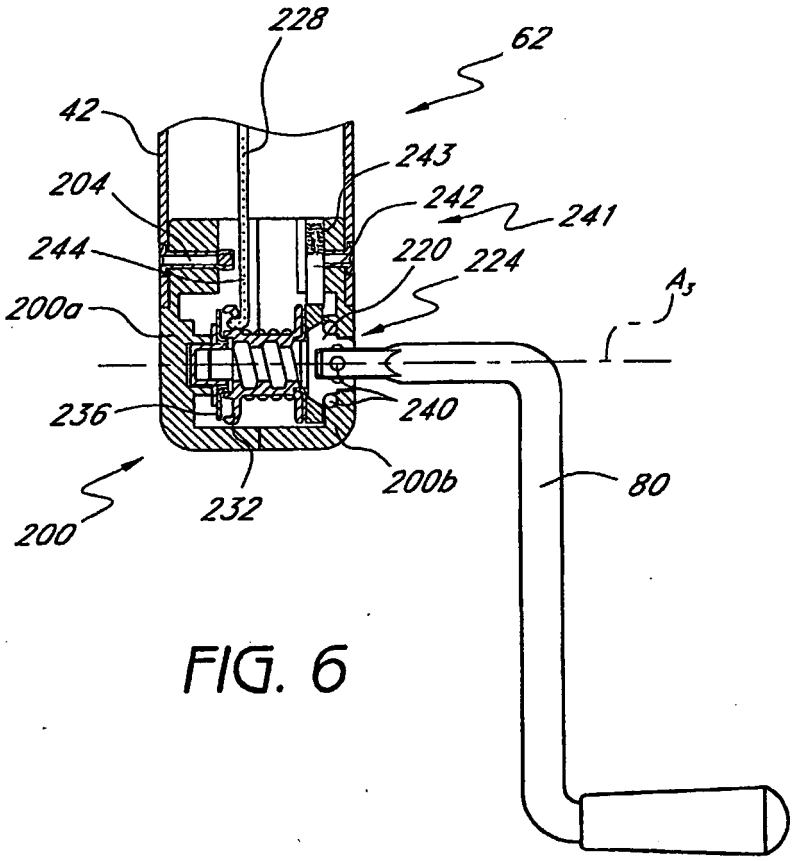


FIG. 5A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62
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220
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A_3
200a
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80
232
200

FIG. 6

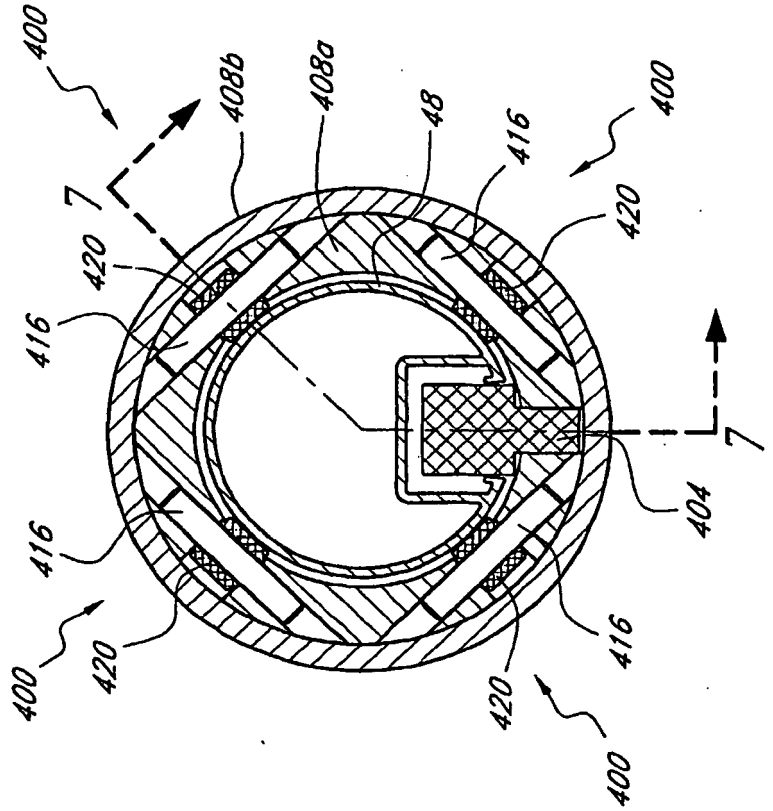
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FIG. 8

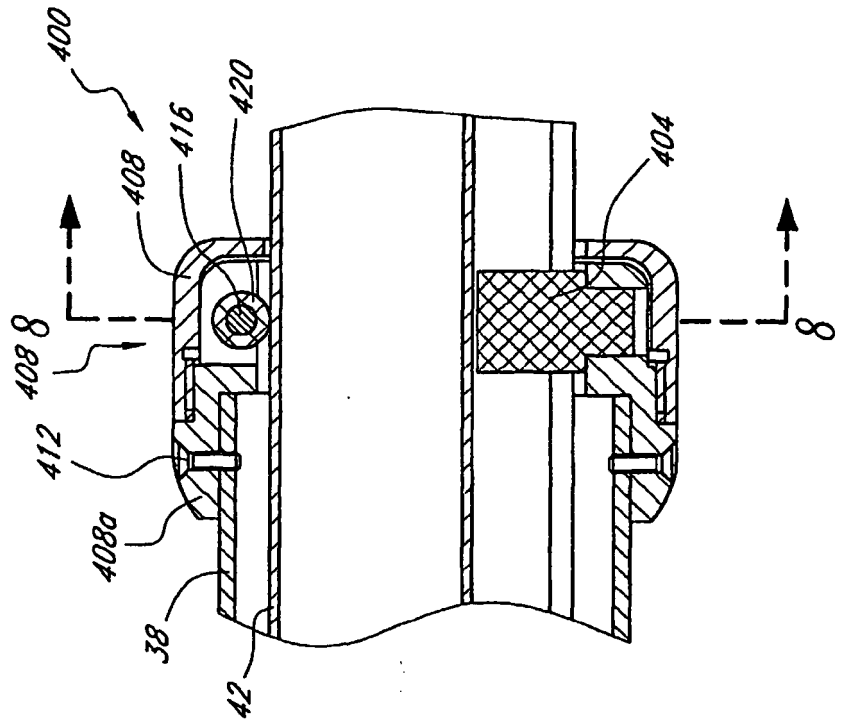
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FIG. 7

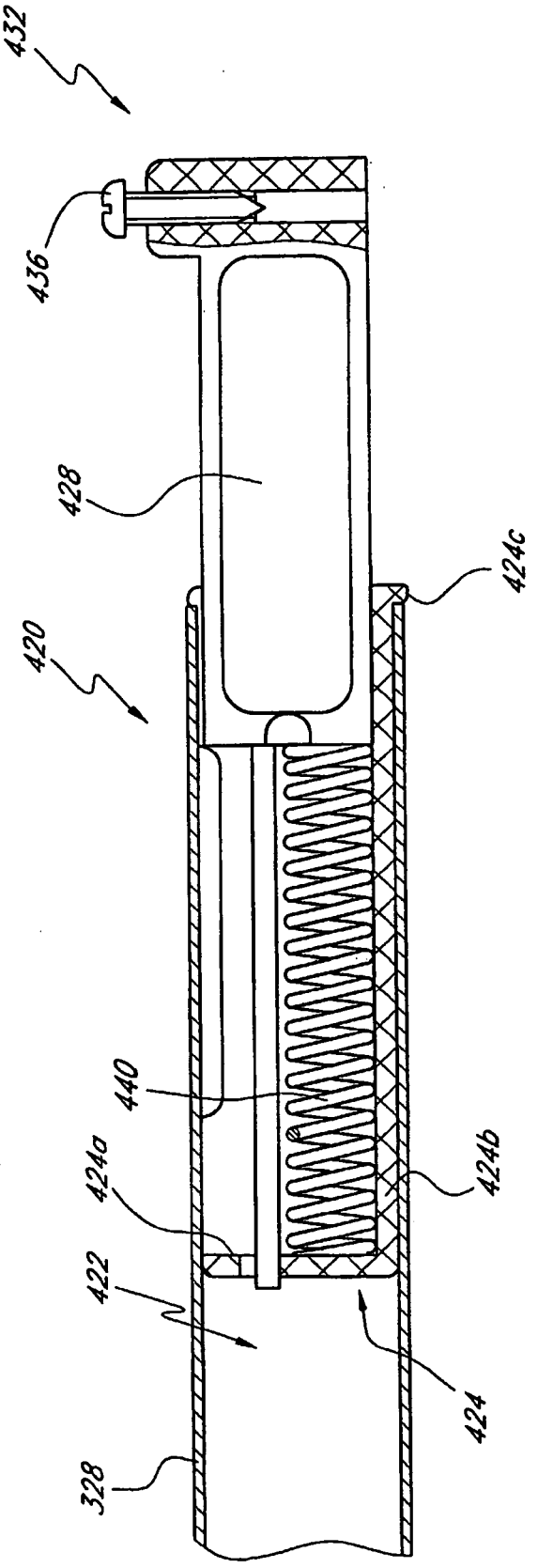

FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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