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DESCRIPTION WO2017028659A1

10 A kind of central lock and tent Technical field The present invention relates to an outdoor product, in particular to a center lock and a tent.

12 Background technique As people's lives continue to improve, tents are used more and more frequently. Tents generally include a foldable tent frame and a tarpaulin. The tent frame is composed of a canopy frame and four or more support legs. The support legs are used to support the canopy frame, and there are also A locking structure is provided, and the tarpaulin covers the canopy frame for sunshade, rain protection or wind protection. At present, the locking structure is generally a locking pin, which locks the unfolded state of the tent through separate locking of each support leg. However, this method has the following shortcomings:

18 During the process of unfolding or folding the tent, the locking mechanism on each support leg requires the user to perform locking or unlocking operations one by one during the process of opening or closing the tent, which is relatively cumbersome and may cause functional defects or forced unlocking if forgotten.

Misoperation, and the opening or closing of the tent requires the cooperation of multiple people to set up the tent. In addition, when the tent is unfolded and set up, the stress points at the multiple support legs are unevenly stressed, so it is difficult to support the tent to the optimal point, thus affecting the support effect of the tent; in addition, the tent is damaged Many are damaged on the support legs of the tent. Since the position of the slider needs to be fixed after the tent is unfolded, the support legs will have holes at the fixed position of the slider for inserting locking pins, and holes will be opened on the support legs. The support strength of the support legs is weakened, so the support legs are usually damaged at the fixed position of the slider, thus shortening the service life of the tent.

29 Contents of the invention

30 In view of the above-mentioned shortcomings of the prior art, the technical problem to be solved by the present invention is to provide a center lock that can support the entire tent and make the tent evenly stressed.

32 In order to achieve the above object, the present invention provides a center lock, which includes a center rod, a center top cap fixed on one end of the center rod, and a center bottom cap detachably connected to the other end of the center rod. The center bottom cap accommodates There is a locking piece that can move back and forth in the radial direction of the center rod. The locking piece is provided with a first through hole that can accommodate the center rod. Locking part; when the center lock is in the locked state, part of the inner wall of the first through hole on the locking part engages with the slot of the center rod, and the upper

end surface of the locking part abuts against the lower end surface of the locking part; when the central lock is in the unlocked state, the inner wall of the first through hole on the locking member is separated from the locking groove, and the locking portion can pass through the first through hole.

41 Another technical problem to be solved by the present invention is to provide a tent with good support effect and uniform stress.

43 In order to achieve the above object, the present invention provides a tent including at least three support legs, an outer telescopic unit connected between two adjacent support legs, and an inner telescopic unit connected to each support leg. The outer telescopic unit The canopy frame of the tent constitutes the tent with the inner telescopic unit, and also includes a central lock as described above, and the inner ends of the plurality of inner telescopic units are connected through the central lock.

48 As mentioned above, the center lock and tent related to the present invention have the following beneficial effects:

50 In the center lock, the engagement or disengagement of the center pole and the locking part can be achieved by moving the locking part, thereby realizing the detachable connection between the center pole and the center bottom cap. Therefore, after the center lock is applied to the tent, After unfolding the tent, the entire tent can be supported through the connection between the center pole and the center bottom cap. It is very convenient to operate and ensures that the force on each support leg of the tent is even, thereby improving the overall support effect of the tent; in addition, it is installed with After the center-locked tent is unfolded, the tent can be fixed through the connection between the center pole and the center bottom cap. Therefore, the holes for fixing the sliders on the support legs of the tent are removed, thereby improving the strength of the tent support legs. Reinforcement ultimately strengthens the structural strength of the tent and extends the service life of the tent.

60 Description of the drawings Figure 1 is an exploded view of the central lock related to the present invention.

61 Figure 2 is a schematic structural diagram of the center lock in a locked state.

62 Fig. 3 is a cross-sectional view taken along line A-A in Fig. 2 .

63 Fig. 4 is a cross-sectional view taken along line B-B in Fig. 2 .

64 Fig. 5 is a cross-sectional view taken along line C-C in Fig. 2 .

65 Figure 6 is a schematic diagram of the connection between the center rod and the center bottom cap in Figure 2.

67 Figure 7 is a schematic structural diagram of the central lock in the unlocked state.

68 Fig. 8 is a cross-sectional view taken along line D-D in Fig. 7 .

69 Fig. 9 is a cross-sectional view taken along line E-E of Fig. 7 .

70 Fig. 10 is a cross-sectional view taken along line F-F in Fig. 7 .

71 Figure 11 is a schematic diagram of the connection between the center rod and the center bottom cap in Figure 7.

73 Fig. 12 is a cross-sectional view taken along line G-G in Fig. 8 .

74 Figure 13 is a top view of the locking member of the present invention.

75 Fig. 14 is a left side view of Fig. 13.

76 FIG. 15 is a cross-sectional view taken along the line H-H in FIG. 13 .

77 Figure 16 is a schematic structural diagram of the tent in an open state according to the present invention.

78 Figure 17 is a schematic structural diagram of the center lock in Figure 16.

79 Figure 18 is a schematic diagram of the connection between the slider, fixed joints and supporting legs in Figure

16.

81 Figure 19 is a state diagram of the tent during unfolding or folding.

82 Figure 20 is a schematic structural diagram of the folded tent.

83 Figure 21 is another embodiment of the tent.

84 Figure 22 shows another embodiment of the central lock of the present invention.

85 Figure 23 is a schematic diagram of the connection between the center rod and the center bottom cap when the center lock is in the locked state in Figure 22.

87 FIG. 24 is a cross-sectional view taken along the line I-I in FIG. 23 .

88 Figure 25 is a schematic diagram of the connection between the center rod and the center bottom cap when the center lock is in the unlocked state in Figure 22.

90 Fig. 26 is a cross-sectional view taken along the line J-J in Fig. 25.

91 Explanation of reference signs

1

95 1 center top hat

2

99 2 center rod

3

103 3 center bottom cap

4

107 4 locking parts

5

111 5 springs

6

115 6 support legs

7

119 7 External telescopic unit

8

123 8 inner telescopic units

9

127 9 sliding sleeve

10

131 10 fixed sections

11

135 11 screws

136 21 card slots

137 22 Locking Department

138 31 bottom cap holder

139 32 bottom cap

140 41 First through hole

141 42 grooves

142 43 guide support part

143 44 Locking part pressing part

144 45 stretch silk

145 46 unlock push piece

146 71 The first eaves pipe

147 72 Second eaves pipe

148 81 The first inclined jacking pipe

149 82 Second inclined jacking pipe

150 83 First connecting rod

151 84 Second connecting rod

152 85 The third inclined jacking pipe

153 86 The fourth inclined jacking pipe

154 221 Guidance Department

155 311 Containment Chamber

156 312 opening

157 313 Anti-hair loss department

158 314 Second through hole

159 315 First tapered part

160 316 Cylindrical part

161 317 Second tapered part

162 318 connecting piece

163 321 Containment Hole

164 322 Reducing trough

165 411 engaging hole

166 412 Through hole part

167 413 chamfer part

168 451 elastic body part

169 452 Elastic deformation part

170 453 narrow mouth

171 454 socket

172 461 guide surface

173 Detailed ways

174 The invention provides a center lock and a tent equipped with the center lock.

175 As shown in Figures 1 and 2, the center lock includes a center rod 2, a center top cap 1 fixed on one end of the center rod 2, and a center bottom cap 3 detachably connected to the other end of the center rod 2.

177 As shown in Figure 1, the center top cap 1 is fixedly connected to one end of the center rod 2 through screws 11; the center bottom cap 3 and the other end of the center rod 2 are detachably connected as shown in Figures 2 to 12. As shown, the center bottom cap 3 contains a locking member 4 that can move back and forth along the radial direction of the center rod 2. The locking member 4 is provided with a first through hole 41 that can accommodate the center rod 2 to pass through. The end of the center rod 2 is provided with a latching slot 21 and a latching portion 22 located at the lower end of the latching slot 21; when the center lock is in the locked state, see Figure 6, part of the inner wall of the first through hole 41 on the locking member 4 and the center The slot 21 of the rod 2 is engaged, and the upper end surface of the locking part 22 abuts against the lower end surface of the locking member 4, so the locking part 22 cannot pass through the first through hole 41, so the center rod 2 is in contact with the center The bottom caps 3 are connected to each other; when the center lock is in the unlocked state, see Figure 11, the locking member 4 moves in the radial direction of the center rod 2, so that the inner wall of the first through hole 41 on the locking member 4 is in contact with the slot. 21 is separated, the locking portion 22 can pass through the first through hole 41, so the center rod 2 can also be moved out of the center bottom cap 3, so that the center rod 2 and the center bottom cap 3 are separated.

192 Furthermore, the above-mentioned central lock is mainly installed in the tent so that the tent has a better supporting effect. Of course, the above-mentioned central lock can also be installed in other equipment.

194 As shown in Figure 16, the tent equipped with the central lock includes at least three support legs 6, an outer telescopic unit 7 connected between two adjacent support legs 6, and an inner telescopic unit connected to each support leg 6. 8. The outer telescopic unit 7 and the inner telescopic unit 8 constitute the canopy frame of the tent. The canopy frame and the plurality of support legs 6 constitute the tent frame of the tent. The canopy frame is covered with tarpaulin, and the plurality of tent frames are covered with tarpaulin. The inner ends of the inner telescopic unit 8 are connected through the center lock.

200 In this embodiment, there are four supporting legs 6, so there are four outer telescopic units 7 and inner telescopic units 8; in addition, for convenient operation, the central top cap 1 is located at the upper end of the central rod 2, the center bottom cap 3 is located at the lower end of the center rod 2, so that the center bottom cap 3 can be easily pulled up or down.

204 When the tent is in the folded state, as shown in Figure 20, the center top cap 1 and the center bottom cap 3 of the center lock are separated from each other.

- 206 When unfolding the tent, as shown in Figure 19, first unfold the four supporting legs 6 outwards with the center lock as the center, and the outer telescopic unit 7 and the inner telescopic unit 8 gradually extend outward; after the tent is unfolded, Push the center bottom cap 3 toward the center rod 2, that is, move the center bottom cap 3 upward, so that the center rod 2 is inserted into the center bottom cap 3, and the portion of the slot 21 on the center rod 2 and the first through hole 41 The inner walls are engaged, so part of the upper end surface of the locking part 22 abuts part of the lower end surface of the locking member 4 to restrict the locking part 22 from passing through the first through hole 41, thereby accordingly restricting the center rod 2 from passing through. The center bottom cap 3 is moved out to realize the mutual connection between the center bottom cap 3 and the center rod 2.
- 215 After the center bottom cap 3 is connected to the center pole 2, the unfolded state of the tent is fixed and the entire tent is locked. At this time, in the absence of external force, the inner telescopic unit 8 will not automatically expand and contract, so the outer telescopic unit 8 will not expand or contract automatically. The unit 7 will not automatically expand and contract, so the stability of the tent in the unfolded state is very good; multiple inner telescopic units 8 are evenly distributed on the outer periphery of the central lock, so that each inner telescopic unit 8 is evenly stressed, so that each support leg 6 Bear the gravity of the canopy frame evenly to improve the overall support effect of the tent.
- 222 In addition, after the tent equipped with the center lock is unfolded, the tent can be fixed through the connection between the center pole and the center bottom cap. Compared with the mechanical locking method in the prior art that uses a locking pin to fix the slider, this application does not require The slider is locked on the support leg, so the hole for fixing the slider on the support leg of the tent is removed, thereby strengthening the strength of the tent support leg, ultimately strengthening the structural strength of the tent and extending the service life of the tent. .
- 228 When folding the tent, move the locking member 4 so that the inner wall of the first through hole 41 on the locking member 4 is separated from the slot 21. At this time, the locking portion 22 can pass through the first through hole 41, so the center pole 2 can also be moved out of the center bottom cap 3, so that the center bottom cap 2 and the center bottom cap 3 are separated; then force is applied to pull the center bottom cap 3 away from the center bottom cap 2, that is, the center bottom cap 3 is pulled downward, so that the inner The telescopic unit 8 retracts in the direction close to the center lock, as shown in Figure 19, and finally the outer telescopic unit 7 gradually retracts, and the plurality of supporting legs 6 retracts in the direction close to the center lock, as shown in Figure 20.
- 236 To sum up, the tent equipped with the center lock of the present invention is very convenient to operate when unfolding or folding. After the tent is unfolded, the support effect is good and the strength is high, so that it has a long service life; and the center lock has a simple structure and Easy to manufacture and low cost.
- 239 Further, as shown in Figures 16 to 18, each support leg 6 is covered with a sliding sleeve 9 that can move along the length direction of the support leg 6, and a fixed joint 10 is fixed at the upper end of the support leg 6. The outer telescopic unit 7 includes three X-shaped rods that are hinged to each other. Each X-shaped rod includes a first eave tube 71 and a second eave tube 72 that are hinged to each other, and the hinge points of the first eave tube 71 and the second eave tube 72 are located at At or near the midpoint of the first eave tube 71 or the second eave tube 72; the inner telescopic unit 8 includes a first inclined roof tube 81 and a second inclined roof hinged to each other through a U-shaped connecting piece. Pipe 82; a first connecting rod 83 is hinged at or near the midpoint of the first inclined top pipe 81, and a second connecting rod 84 is hinged at or near the midpoint of the second inclined top pipe 82. Four The inner ends of the first inclined top tube 81

are all hinged with the center top cap 1 of the center lock, the inner ends of the four first connecting rods 83 are all hinged with the center bottom cap 3 of the center lock, and the upper end of a support leg 6 is fixed. The section 10 is hingedly connected to the outer end of the first eaves pipe 71 of the two X-shaped rods and the outer end of the second inclined roof pipe 82. The sliding sleeve 9 on the supporting leg 6 is connected to the two X-shaped rods. The outer end of the second eaves pipe 72 and the outer end of a second connecting rod 84 are hinged with the sliding sleeve 9.

254 In this embodiment, the first inclined elevating pipe 81 and the first connecting rod 83, the second inclined elevating pipe 82 and the second connecting rod 84 all constitute a Y-shaped member, that is, the inner telescopic unit 8 is composed of multiple Y-shaped members. In another embodiment, the inner telescopic unit 8 may also be composed of multiple X-shaped members, as shown in Figure 21. In this case, each X-shaped member of the inner telescopic unit 8 includes a third inclined member hinged to each other. The top tube 85 and the fourth inclined top tube 86 are located in the innermost X-shaped member of the inner telescopic unit 8. The inner end of the third inclined top tube 85 is hinged with the center top cap 1 of the center lock. The fourth inclined top tube 86 is The inner end is hinged with the center bottom cap 3 of the center lock; located in the outermost X-shaped member of the inner telescopic unit 8, the outer end of the third inclined top tube 85 is hinged with the sliding sleeve 9, and the outer end of the fourth inclined top tube 86 is hinged with Fixed section 10 hinged.

265 After the tent's canopy frame adopts the above structure, in the process of pushing the center bottom cap 3 of the center lock upward to unfold the tent, the upward movement of the center bottom cap 3 causes the inner telescopic unit 8 to extend outward; at the same time, the sliding sleeve 9 Move upward along the length direction of the support legs 6 so that the outer telescopic unit 7 and the four support legs 6 gradually extend until the entire tent is fully deployed and the center bottom cap 3 is connected to the lower end of the center pole 2 . On the contrary, after the center bottom cap 3 is separated from the lower end of the center rod 2, and in the process of pulling the center bottom cap 3 downward, the downward movement of the center bottom cap 3 causes the inner telescopic unit 8 to shrink inward; at the same time, The sliding sleeve 9 moves downward along the length direction of the supporting legs 6, so that the outer telescopic unit 7 and the four supporting legs 6 gradually close up until the entire tent is completely folded.

275 Further, as shown in Figures 1, 6 and 11, the central bottom cap 3 includes a bottom cap base 31 and a bottom cap cover 32 that are fixedly connected to each other through a plurality of screws. A receiving cavity 311 is provided at the connection between 31 and the bottom cap 32, and an opening 312 connected with the receiving cavity 311 is provided on the outer wall of the central bottom cap 3. The locking member 4 is disposed between the receiving cavity 311 and the receiving cavity 311. In the opening 312 , between the bottom cap base 31 and the bottom cap 32 , it is supported by the bottom cap 32 . The receiving cavity 311 may be entirely provided on the bottom cap base 31 , or may be entirely provided on the bottom cap 32 , or may be provided on both the bottom cap base 31 and the bottom cap 32 . The bottom cap base 31 and the bottom cap cover 32 are detachably connected through screws, thereby facilitating the installation between the central bottom cap 3 and the locking member 4 . In addition, eight connecting pieces 318 are provided on the bottom cap seat 31 of the center bottom cap 3 and on the center top cap 1. The eight connecting pieces 318 constitute four groups of connecting pieces arranged at 90 ° intervals, that is, each group of connecting pieces is Each set includes two connecting pieces 318. A receiving groove is formed between the two connecting pieces 318. The inner ends of the four first inclined top tubes 81 are respectively placed in the four receiving grooves of the central top cap 1, and They are all hinged with bolts and connecting pieces 318, and

the ends of the bolts are threaded with nuts; the inner ends of the four first connecting rods 83 are respectively placed in the four receiving grooves of the bottom cap base 31, and are all connected with the connecting pieces through bolts. 318 hinged, the end of the bolt is threaded with a nut.

- ²⁹³ In this application, there are two embodiments of the locking member 4. The first embodiment of the locking member 4 is shown in Figures 1 to 15, and the second embodiment of the locking member 4 is shown in Figures 21 to 26. Specifically, in the first embodiment of the locking member 4, the locking member 4 is an integral component, that is, an integrated structure. At this time, as shown in Figures 6 and 11, the receiving cavity 311 is provided with a central The rod 2 is a radially compressible elastic element. The two ends of the elastic element are respectively against the locking member 4 and the inner wall of the receiving cavity 311. The bottom cap base 31 is provided with a protruding anti-loosening portion 313. The locking part 4 is provided with a groove 42 for receiving the anti-separation part 313; when the center lock is in the locked state, the elastic force of the elastic element itself exerts a force on the locking part 4 in the radial direction of the center rod 2, so that the Part of the inner wall of the first through hole 41 is located in the slot 21. Even if part of the inner wall of the first through hole 41 is engaged with the slot 21, the center rod 2 is restricted from protruding from the first through hole 41 along its axial direction; Part of the side surface of the anti-removal portion 313 abuts part of the inner wall of the groove 42 to restrict the locking member 4 from coming out of the receiving cavity 311 . Preferably, as shown in Figures 1, 13 and 14, the elastic element is a spring 5, and the locking member 4 is provided with a protruding guide support 43 at one end away from the opening 312. The cross section of the portion 43 is cross-shaped, and the spring 5 is placed on the guide support portion 43 to ensure better stability during the inward movement of the locking member 4 and to ensure that the center lock is in the locked state. The overall structure also has good stability.
- ³¹¹ Preferably, as shown in FIG. 13 , the first through hole 41 includes an engaging hole portion 411 and a through hole portion 412 arranged side by side. The diameter of the engaging hole portion 411 is not smaller than the diameter of the engaging groove 21 , that is, the engaging hole portion 411 is not smaller than the diameter of the engaging hole portion 411 . The diameter of the closing hole 411 is equal to or slightly larger than the diameter of the latching groove 21, and the diameter of the through hole 412 is larger than the diameter of the latching part 22. Therefore, when the center lock is in the locked state, the latching groove 21 at the lower end of the center rod 2 is in contact with the first through hole. The engaging hole portion 411 of the hole 41 is engaged, and the center rod 2 is eccentrically arranged with the through hole portion 412 of the first through hole 41, as shown in Figure 4, that is, the axis of the center rod 2 is parallel to the axis of the through hole portion 412. But not coincident. When the center lock needs to be unlocked, the user pushes the locking member pressing part 44 hard, causing the locking member pressing part 44 to move inward to compress the elastic element until the first through hole 41 on the center rod 2 and the locking member 4 The through hole portion 412 is concentrically arranged, as shown in Figure 9 , that is, the axis of the center rod 2 coincides with the axis of the through hole portion 412, the inner wall of the engaging hole portion 411 is removed from the slot 21, and the lower end of the center rod 2 The locking portion 22 can be removed from the through-hole portion 412 .
- ³²⁷ In the second embodiment of the locking member 4, the locking member 4 has a split structure, as shown in Figures 22 to 26, and includes an elastic wire 45 and an unlocking push piece 46. The elastic wire 45 is U-shaped and includes an elastic wire. The wire body part 451 and two elastic deformation parts 452 are respectively provided at both ends of the elastic wire body part 451. The two elastic deformation parts 452 are in an The narrow opening 453 of the through hole 41 is the opening section with the smallest distance

between the elastic elastic parts 452. The end of the elastic deformation part 452 forms a socket 454, and the inner end of the unlocking push piece 46 is located in the socket 454. In the natural state, the diameter of the narrow opening 453 is less than or equal to the diameter of the slot 21. When the center rod 2 is inserted into the center bottom cap 3, the locking portion 22 opens the narrow opening 453 until the center rod 2 is locked. When the groove 21 is aligned with the inner wall of the narrow opening 453 on the elastic wire 45, the narrow opening 453 narrows under the elastic restoring force of the elastic wire 45 itself, so that the inner wall of the narrow opening 453 is stuck in the slot 21 of the center rod 2, thereby realizing the position locking of the center bottom cap 3 and the center top cap 1, see Figure 23 and Figure 24. When it is necessary to unlock, press the unlocking push piece 46 and push it inward, thereby opening the socket 454 of the elastic wire 45 until the diameter of the narrow opening 453 is larger than the diameter of the locking part 22, so that the locking part 22 can pass through the narrow opening 453. Through the middle pass, see Figure 25 and Figure 26, the separation of the center top cap 1 and the center bottom cap 3 is achieved, and the folding action of the tent is realized.

345 Preferably, as shown in Figures 23 and 25, the bottom cap base 31 is provided with a protruding anti-removal portion 313, and the unlocking push piece 46 is provided with a groove 42 for accommodating the anti-removal portion 313. The portion 313 and the groove 42 cooperate with each other to prevent the unlocking push piece 46 from protruding from the receiving cavity 311, and also prevent the unlocking push piece 46 from being pushed too far during unlocking. The unlocking push piece 46 is provided with two guide surfaces 461 that are in contact with the ends of the elastic deformation portion 452. The guide surfaces 461 are diffusely inclined toward the end away from the elastic wire 45, that is, the inner end of the unlocking push piece 46 is in the shape of a ladder. shape to ensure that the socket 454 and the narrow opening 453 of the elastic wire 45 are accurately opened when the unlocking push piece 46 is pushed inward.

354 Preferably, in order to facilitate the movement of the locking member 4, at least a part of the locking member 4 is placed outside the central bottom cap 3 to form the locking member pressing portion 44.

356 Further, as shown in FIG. 6, the bottom cap base 31 is provided with a second through hole 314 for the center rod 2 to pass through. The axis of the second through hole 314 coincides with the axis of the center rod 2. The cover 32 is provided with a receiving hole 321 for receiving the locking portion 22 and matching the outer wall of the locking portion 22. The second through hole 314, the first through hole 41 and the receiving hole 321 are connected. When the center lock is in the locked state, the lower end of the center rod 2 is passed through the second through hole 314 of the bottom cap base 31 and the first through hole 41 of the locking member 4 in sequence, and the locking portion 22 is received in In the receiving hole 321 of the bottom cap 32; since the shape of the inner wall of the receiving hole 321 matches the shape of the outer wall of the locking portion 22, the inner wall of the receiving hole 321 fits the outer wall of the locking portion 22, thereby preventing the center from being The locking portion 22 of the rod 2 will rock and move under the action of external force, thereby improving the locking reliability of the central lock.

367 To sum up, when the center lock composed of the bottom cap base 31, the bottom cap cover 32, the spring 5, the locking member 4, the center rod 2, and the center top cap 1 is locked, the user pushes the center bottom cap 3 upward. Moving, the distance between the center bottom cap 3 and the center top cap 1 gradually decreases. When no external force is applied to the locking member 4, the locking member 4 is only subject to the elastic force of the spring 5, and the elastic force of the spring 5 separates part of the inner wall of the groove 42 on the locking member 4 and the anti-separation portion 313 of the bottom cap base 31. Part of the outer wall abuts, so the locking member 4 is still contained in the receiving cavity 311 under the elastic force

of the spring 5 and will not protrude outward from the receiving cavity 311. The first through hole on the locking member 4 The through hole portion 412 of 41 is eccentrically arranged with the second through hole 314 on the bottom cap base 31 . When the user pushes the center bottom cap 3 and continues to move upward until the lower end of the center rod 2 enters the second through hole 314 on the bottom cap base 31; the user continues to apply force to make the center bottom cap 3 move upward. When the lower end of the center rod 2 When the locking portion 22 enters the upper end of the first through hole 41 on the locking member 4, the user applies force to overcome the pressure of the spring 5 on the locking member 4, causing the locking member 4 to move inward, thereby causing the center rod 2 to The locking portion 22 at the lower end passes through the first through hole 41 on the locking member 4 and is received in the receiving hole 321 of the bottom cap 32, and the locking member 4 is reset under the elastic force of the spring 5, so that The engaging hole portion 411 of the first through hole 41 engages with the engaging groove 21 on the center rod 2, thereby completing the connection between the center rod 2 and the center bottom cap 3, and realizing the locking of the center lock. When unlocking, the user presses the locking member pressing portion 44 inward to overcome the elastic force of the spring 5 to move the locking member 4 inward. When the inner wall of the engaging hole portion 411 is separated from the engaging groove 21 and the center rod 2 After the through-hole portion 412 of the through-hole 41 is aligned, pull the center bottom cap 3 and move it downward.

391 Further, in order to facilitate the penetration of the center rod 2 into the bottom cap seat 31 and the locking member 4, as shown in Figures 6 and 11, the second through hole 314 is formed along the direction in which the center rod 2 penetrates into the center bottom cap 3. It includes in sequence a first tapered portion 315 with a gradually decreasing diameter, a cylindrical portion 316 and a second tapered portion 317 with a gradually increasing diameter. The diameter of the cylindrical portion 316 is slightly larger than the diameter of the central rod 2 . Therefore, when the bottom cap base 31 is moved upward to connect with the lower end of the center rod 2, the first tapered portion 315 at the upper end of the second through hole 314 has a larger opening to facilitate the insertion of the locking portion 22 into the bottom cap base 31; as in As shown in Figure 15, the upper end of the first through hole 41 is chamfered to form a chamfer 413 with a gradually decreasing diameter. Therefore, the opening at the upper end of the first through hole 41 is also larger and has a slope so that The locking part 22 is inserted into the locking member 4 to serve as a guide; when the center rod 2 is separated from the center bottom cap 3, the bottom cap base 31 moves downward, and the second tapered shape at the lower end of the second through hole 314 The opening of the portion 317 is larger so that the locking portion 22 can be easily disengaged from the second through hole 314 . Preferably, the locking groove 21 is an annular groove, and the end of the locking part 22 is provided with a guide part 221. The guide part 221 is in the shape of a hemisphere or a cone with a gradually decreasing diameter to facilitate entry of the locking member. 4 in the first through hole 41, and is not easy to wear.

408 Further, as shown in FIG. 1 , while ensuring the structural strength of the center lock, a plurality of material reduction grooves 322 are provided in the bottom cap 32 to reduce material usage and cost. In addition, the side surfaces of the central bottom cap 3 are in arc shape to facilitate grasping of the central bottom cap 3 .

411 To sum up, the present invention effectively overcomes various shortcomings in the prior art and has high industrial utilization value.