

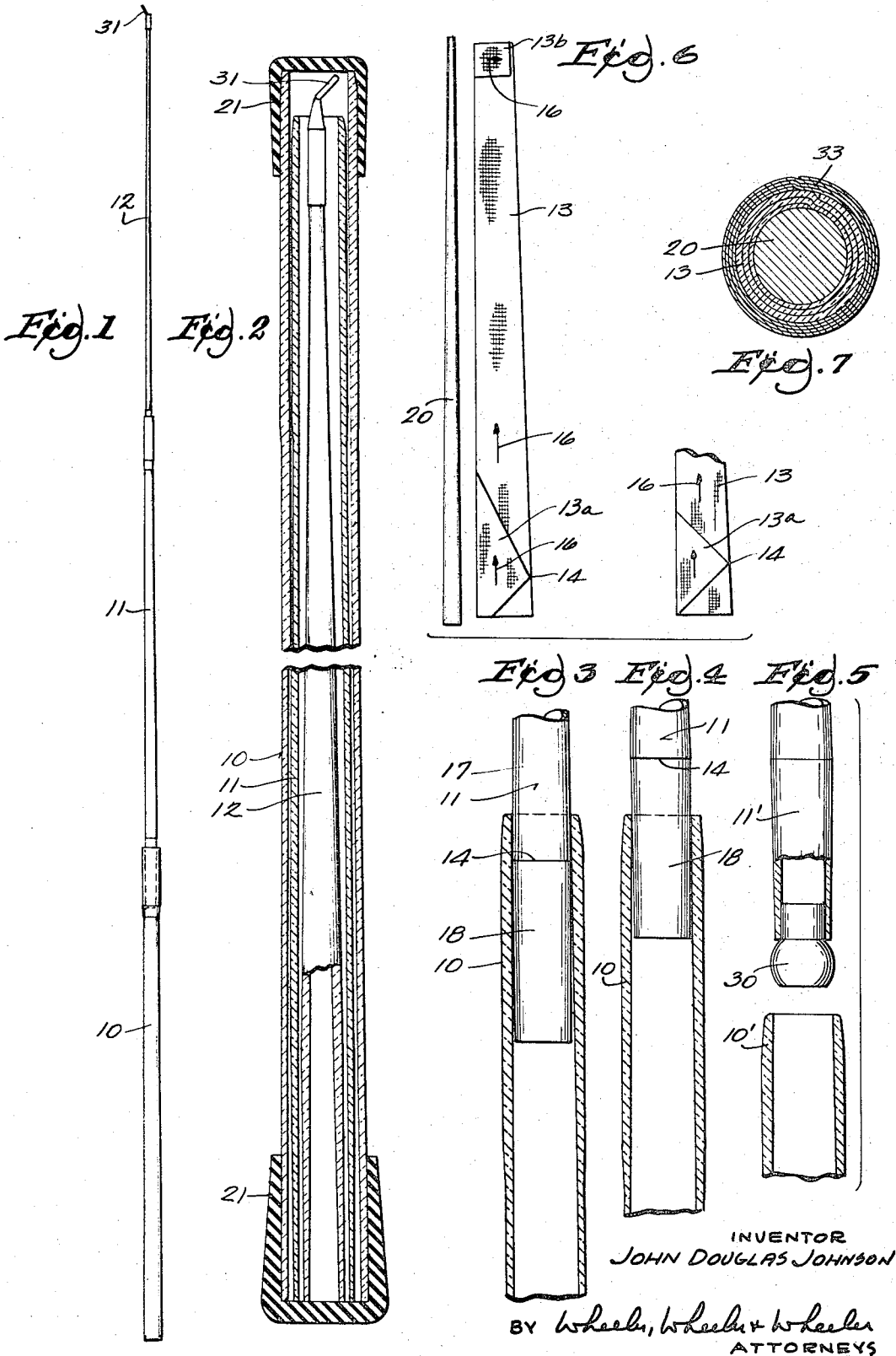
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TELESCOPIC FISHING POLE

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TELESCOPIC FISHING POLE

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ABSTRACT OF THE DISCLOSURE

A pole having tapered sections with the largest outside diameter of each section being spaced inwardly from its largest end extends telescopically by moving each section in the direction of its small end until it jams in the next section, and may also be socketed by moving each section in the direction of its large end toward the small end of the next larger section. The specially tapered tube shapes are achieved by the special shape of the blank which is wound to form the respective tubes. Fiberglass having greatest strength axially of the tube is used and end reinforcing having greatest strength circumferentially is added. In a modification a rubber plug extends from the larger end of each section and frictionally contacts the inner diametrical wall of the small end of an adjacent section.

Summary of the invention

My invention consists in providing an extensible pole having all of the sections stored in the largest section and which is capable of two distinct modes of extension, a telescopic extension in the direction of the small ends of the sections which may be carried out with a single motion by pulling out the smallest section continuously until all sections are locked in place, or a socketing mode effected by socketing the separated sections with a motion toward the large ends of the respective sections. The invention further consists in a rod made of fiberglass having a greater proportion of its strength extending circumferentially. The invention further consists of a method of manufacture in which the fiberglass blank has a novel shape which provides a variation in the slope of the external taper to peak near, but not at, the large end of the rod, the blank comprising a trapezoidal sheet having an additional tapered portion at one end.

Drawings

FIG. 1 is a side view of my rod assembled in the socketed mode of assembly.

FIG. 2 is a longitudinal cross sectional view of my device with a portion of the smallest rod section shown in full lines.

FIG. 3 is an enlarged view of a single joint of my rod with the larger tube shown in cross section and the smaller tube in full lines, showing the telescopic mode of assembly.

FIG. 4 is a view like FIG. 3 showing the socket mode of assembly.

FIG. 5 is a view like FIG. 3 showing a modification of the socket mode of assembly.

FIG. 6 is a top view of my glass cloth blanks ready for winding on a mandrel.

FIG. 7 is a lateral cross sectional view through my device during the later stages of manufacture after the glass cloth has been wound on the mandrel and has been encased in cellophane winding.

My device consists of tubular rod sections, such as 10, 11 and 12, each constructed from resin impregnated glass cloth 13, having its greatest strength in the direction shown by the arrows 16, by reason of a greater count of

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fibers in that direction. Each tube section 10, 11, 12 is slightly tapered from one end to the other, and is so sized with respect to the other tubes in the set that the butt, or larger end, of each tube has a maximum outside diameter at 14 which is slightly larger than the inside diameter of the next larger tube at the small end. The taper is uniform inside the tube. The outside of each tube is divided into a main section 17 and a reverse tapered section 18.

As shown in FIG. 6, the main fiberglass blank 13 is a trapezoid having a height equal to the length of the finished rod section. The width of blank 13 at the base is equal to the perimeter of tapered mandrel 20 at the base, times the desired number of plies of glass cloth. At the top of the blank the width is likewise the desired number of plies times mandrel perimeter at that point. For thin pole tip sections one or two plies is sufficient, while the butt section may have three or more.

Section 13a of the blank is a separate piece placed over main blank 12 and wound onto the mandrel at the same time. Piece 13a has converging margins slanted with respect to the base of trapezoidal blank 13 to meet at an apex which defines the maximum diameter 14 of the tubular section 10, 11 or 12.

A further blank section 13b is wound onto the mandrel at the small end, preferably over the outer ply of blank 13, to reinforce the small end against the forces created when it is used as a socket for the next section. It will be noted from the direction of arrow 16 on blank part 13b that the maximum fiber count and strength are circumferential rather than axial as in blanks 13 and 13a. Blank 13b may be wound with blank 13, if desired. Also a single blank could be shaped to give the same ultimate shape to the tubular section, but would be less economical and would not have higher axial strength throughout with higher circumferential strength in the reinforcement.

As is conventional in forming such tubes the tube is then wound with wet or dry cellophane as shown in FIG. 6. As the cellophane is heated it shrinks and compresses the glass cloth impregnated with resin, and presses the layers tightly together. Further heating causes the resin first to flow and then to set, so that the end result is a smooth article which has the configuration described above.

The reverse taper created by blank 13a is entirely on the outside surface of the tube. The taper of the inside of the tube is uniform from one end to the other.

Looking now at FIGS. 3 and 4, the results of this construction are shown in terms of the method of assembly of the tube for use. The end caps 21 are removed from the largest tube, and (as shown in FIG. 3) the tubes are slid axially toward their small ends until the largest diameter portion 14 of each of the inner tubes 11 and 12 jams in the smaller end of tube 10 due to the gradually decreasing inside diameter of the larger tube 10. This occurs shortly before the largest diameter portion 14 of the inner tube 11 reaches the end of the surrounding tube. Because of the frictional characteristics of resin impregnated glass cloth, the joint thus secured is very firm. At the same time, when the user desires the rod may be collapsed, simply by pushing the tubes 11 and 12 down into the largest tube 10 until they are all encased therein, and replacing the end caps 21.

FIG. 4 shows the socketed connection between the successive tubes 10 and 11, in which the reverse tapered exterior portion of the large end of smaller tube 11 is inserted into the small end of the next larger tube 10. Again, because of the respective dimensions of the tubes, the largest diameter 14 of the smaller tube 11 does not reach the end of the smallest diameter portion of the

larger tube 10. Instead, a tight frictional fit is achieved to form a tight connection between the tubes. This type of connection is preferred by some users because they feel it is more secure, although the telescopic joint is also very tight. It should be noted that there is very little axial stress tending either to separate or to compress the joints between the tubes during use as a fishing rod.

The degree of taper of the tubes has been exaggerated in the drawings in order to show the structure. In actual use there is substantially no detectable looseness in either the socket joint or the telescopic joint between the tubes, despite the reverse taper.

However, in one modification of my invention I provide a rubber plug 30 in the large end of the smaller of two tubular sections 10' and 11'. Plug 30 has a head diameter slightly larger than that of the end of tube 11' and is a frictional fit within the small end of tube 10' to eliminate play and prevent any noise due to relative movement of the sections. The plug 30 may be inserted or withdrawn from section 10' with a twisting of section 10' relative to section 11'.

A line guide 31 is preferably attached to the tip of the smallest rod section. As best shown in FIG. 2 this tip comprises a cap for the section and a wire loop to guide the fish line, the wire loop being at an angle to the cap for the tube. The loop is accommodated by making the second section 11 somewhat shorter than the length of the smallest section 12 with the wire guide attached. Both sections are shorter than the section 10 of largest diameter within which they fit. Caps 21, such as rubber crutch tips, are placed over the ends of the largest tube to confine the rod sections inside.

As used herein, a telescopic connection of the section means sliding the nested sections axially in the direction of their small ends until a frictional fit between the sections is achieved, as distinguished from a socketed connection which means interfitting the large end of a smaller section with the small end of the next larger section by movement axially in the direction toward the large end of the smaller section, that is, by bringing the ends of un-nested sections together. Thus as used herein, telescopic connection and socketed connection have mutually exclusive meanings. The pole or rod of my invention may be used for other types of fishing rods than the one illustrated and may be used for other applications wherein an extensible rod is desired.

I claim:

1. A pole consisting of a plurality of tapered tube sections of graded sizes adapted to nest within the largest

such tube, said pole being characterized by each said section having a portion of largest outside diameter spaced a short distance from one end and its largest inside diameter at said end, the smallest inside diameter of each said section being at the other end of said section, the largest outside diameter of each section other than the largest section of said pole being very slightly larger than the smallest inside diameter of the next larger section of said pole.

2. The device of claim 1 in which each said section consists mainly of resin impregnated woven fiberglass, the majority of the glass fibers in said woven fiberglass extending axially of said sections.

3. The device of claim 2 in which a said section is provided with an added ply limited to the smaller end and having a majority of the glass fibers in said added ply extending circumferentially of said section.

4. The device of claim 1 in which each said section comprises bonded layers formed from a trapezoidal blank of woven fiberglass impregnated with resin wound into tubular form, said sections having a uniformly tapered inner wall, said largest outside diameter portion comprising a separate ply of limited axial extent having edges inclined to the end of said tube to meet at an apex at the largest outside diameter of said section.

5. The device of claim 4 in which the majority of the glass fibers in said woven fiberglass extend axially of said sections.

6. The device of claim 1 in which the smaller of a pair of said sections is provided with an elastic end plug secured in and extending beyond the large end of said section and having a maximum diameter beyond the end of said section slightly larger than the inside diameter of the small end of the larger section of said pair.

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