

[54] WHIP DEVICE

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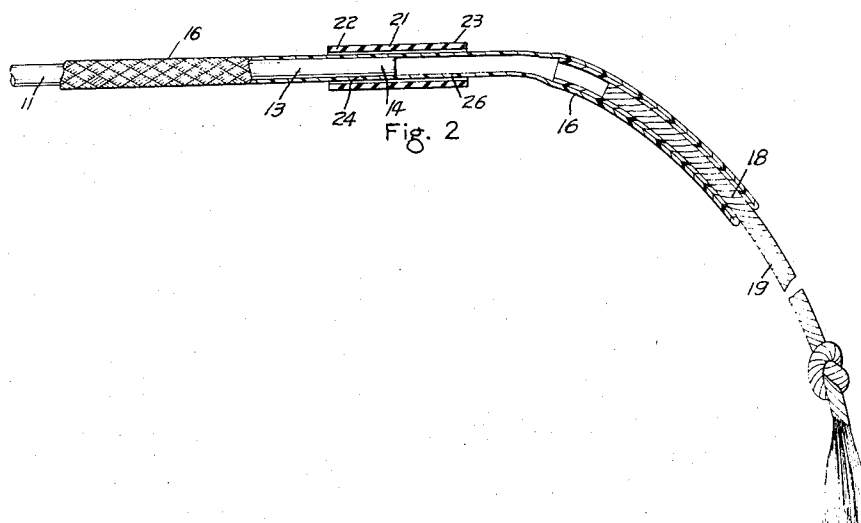
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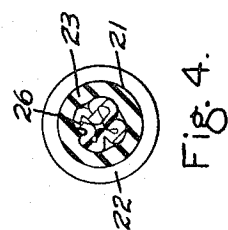
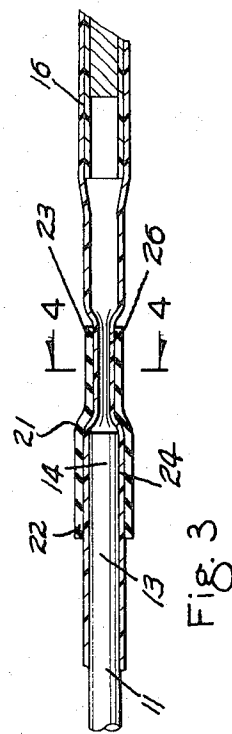
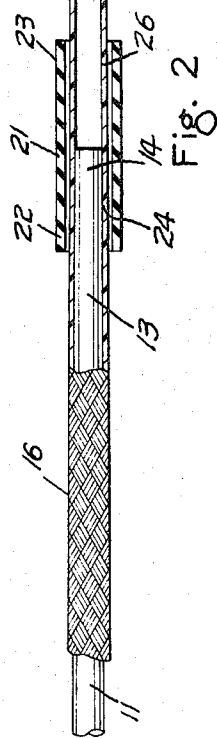
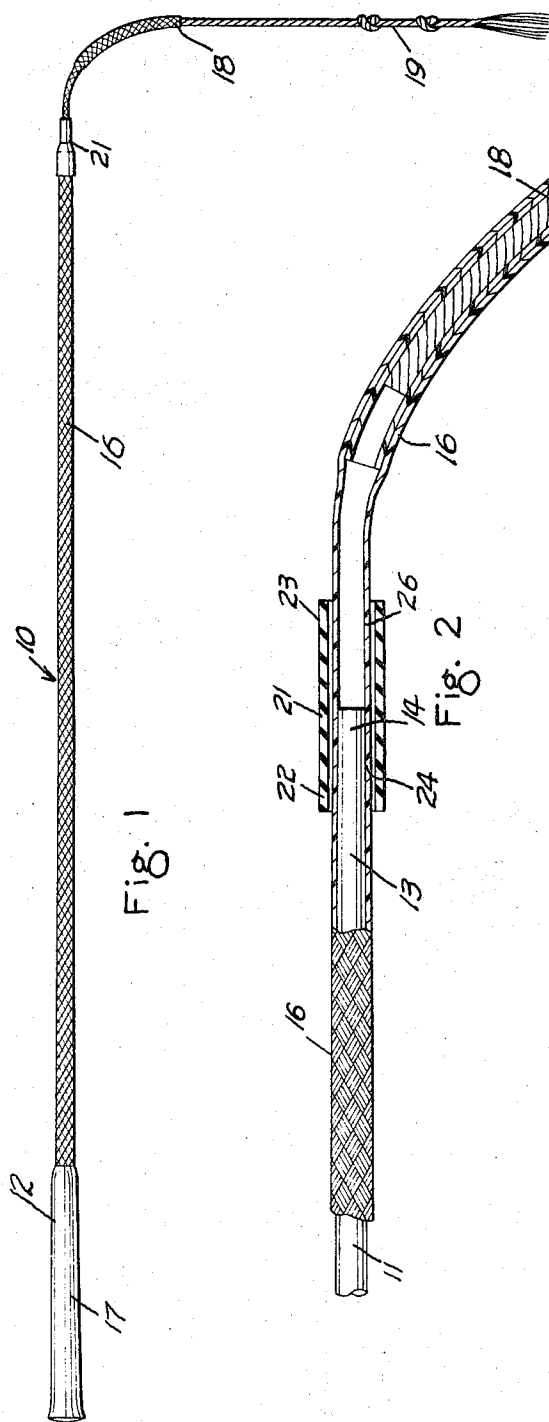
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ABSTRACT

The whip has a fiberglass shaft with a handle end and an outer end including a terminal end portion. The shaft is covered by a tubular braided polyethylene cover which extends beyond the shaft terminal end portion. A pre-expanded tubular member of a thermoplastic material is positioned about the cover at the shaft terminal end portion with a section thereof projected beyond the terminal end portion. The tubular member is radially shrunk by the application of heated air thereto whereby the cover is clamped about the shaft terminal end portion and collapsed beyond the terminal end portion.

2 Claims, 4 Drawing Figures





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WHIP DEVICE

SUMMARY OF THE INVENTION

The whip is of an economical construction and adapted to perform efficiently over a prolonged service life under all weather conditions and kinds of use. The pre-expanded or shrinkable tubular member is bonded to the cover and functions as a shield or guard to prevent the terminal end portion of the shaft from protruding outwardly from the braided cover. By virtue of the cover being collapsed adjacent the outer end portion of the shaft the cover is also prevented from moving downwardly of the shaft toward its handle end.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of the whip of this invention;

FIG. 2 is an enlarged longitudinal sectional view of the outer end of the whip showing the initial assembly position of the pre-expanded plastic tubular member;

FIG. 3 is a longitudinal sectional view of the outer end of the shaft showing the final assembly position of the plastic tubular member; and

FIG. 4 is an enlarged transverse sectional view taken on the line 4—4 in FIG. 3.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 1 and 2 of the drawing, the whip of this invention, indicated generally as 10, has a central flexible shaft 11 made of a reinforced plastic material or the like such as a polyester resin filled with glass fibers or filaments, commonly referred to as fiberglass. Shaft 11 is of a tapered construction from a larger diameter at the whip handle end 12 to a smaller diameter at its outer end 13 which includes a terminal portion 14. This taper contributes to the flexibility of the shaft in use.

The shaft 11 is covered by a tubular cover 16 made of a braided polyethylene material. At the whip handle end 12 the cover 16 is covered by a hand grip 17 of a rubber plastic material. The braided cover 16 is of one piece over its entire length and includes an outer end section 18 which projects outwardly beyond the terminal end portion 14 of the shaft 11. This outer end section 18 is usually referred to as the drop section of the whip and carries at its free end a popper member 19 of a braided nylon material.

Although the braided polyethylene cover 16 has distinctive advantages such as resistance to moisture deterioration, weather conditions and livestock dirt, it has the objection of being rather easily penetrated by the free end of the terminal portion 14 of the shaft 11. This penetration results from the relative movement between the terminal portion 14 and the adjacent portions of the cover 16 as the whip 10 is manipulated or flexed in use. This objection is overcome by the provision of a tubular guard or shield member 21 that is assembled about the cover 16 at the terminal portion 14 of the shaft 11.

In this assembly the tubular member is initially positioned about the cover 16 with one end portion 22 in a concentric relation about the terminal end portion 14 of the shaft 11 and an opposite end portion 23 projected outwardly from the terminal end portion 14. The tubular member 21 is composed of a pre-expanded thermoplastic material which, on the application thereto of heat such as hot air, has the characteristic of

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shrinking radially inwardly to a reduced diameter. Prior to and after shrinkage the tubular member 21 is relatively stiff and hard. This type tubing is usually referred to as "shrink tubing" and may be obtained commercially under the trademark THERMOFIT from the Raychem Corporation of Menlo Park, Calif.

On the application of heated air to the tubular member 21 the end portion 22 thereof (FIG. 3) is drawn or shrunken about the shaft terminal end 14 so as to tightly clamp the cover portion 24 located therein about the shaft terminal end portion 14. The end portion 23 of the tubular member that projects outwardly beyond the shaft terminal end portion 14 is shrunken to a reduced diameter relative to the end portion 22 of the tubular member so as to completely collapse that portion 26 of the braided cover located therein, as illustrated in FIGS. 3 and 4. Hot air may be applied to the tubular member 21 by well-known heating devices commonly referred to as hot air guns, with the air heated to a temperature in the neighborhood of about 500° F. Air at this 500° F. temperature is directed about the tubular member 21 for a time period of about 10 to 30 seconds depending upon the shrinkage desired. The extent of shrinkage of the tubular member is determined by visual observation.

By virtue of the thermoplastic composition of the tubular member 21 and the polyethylene composition of the cover 16, the application of heat to and resultant shrinkage of the tubular member provides for a bonded engagement between the inner peripheral surface of the tubular member and the outer peripheral surface of the cover 16. In other words, the braided cover is partially embedded in the tube member 21.

The shielding or encasing of the shaft terminal end portion 14 by the end portion 22 of the tubular member prevents the free end of the shaft terminal end portion 14 from protruding outwardly through the cover over a prolonged service life of the whip 10. The collapse of the cover portion 26 within the end portion 23 of the tubular member to a reduced diameter less than the diameter of the shaft terminal end portion 14 prevents insertion of the shaft within such collapsed cover portion 26. As a result the cover 16 is held against movement downwardly of the shaft 11 toward the handle 12. Creeping of the cover 16 relative to the shaft 11 is thus substantially eliminated. Since the tubular member 21 effectively constitutes an outer extension for the shaft 11 complete flexibility in the drop section 19 is maintained so that during manipulation of the whip 10 an adequate and desired snapping or popping sound is produced by the popper 19.

Although the invention has been described with respect to a preferred embodiment thereof it is to be understood that it is not to be so limited since changes and modifications can be made therein which are within the full intended scope of this invention as defined by the appended claims.

I claim:

1. A whip comprising:

- a. an elongated cylindrical shaft having a handle end and an outer end including a terminal end portion,
- b. a tubular braided cover for said shaft extending beyond the terminal end portion thereof, and
- c. a tubular member of a thermoplastic shrinkable composition mounted about said braided cover with a first section in a concentric relation with said

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terminal end portion and a second section thereof
 extended beyond said terminal end portion,
 d. said second section, as the result of the application
 of heat to said tubular member, being formed with
 a reduced diameter relative to said first section to
 collapse the cover portion therein to a cross-
 sectional area less than the cross-sectional area of
 said shaft terminal end portion whereby to hold the
 cover against axial movement in a direction toward

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the handle end of said shaft and to prevent said ter-
 minal end portion from protruding through said
 cover.

2. A whip according to claim 1 wherein:

a. said cover is composed of a plastic material so that
 on the application of heat to the tubular member
 the first and second sections thereof are bonded
 with the cover portions therein.

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