

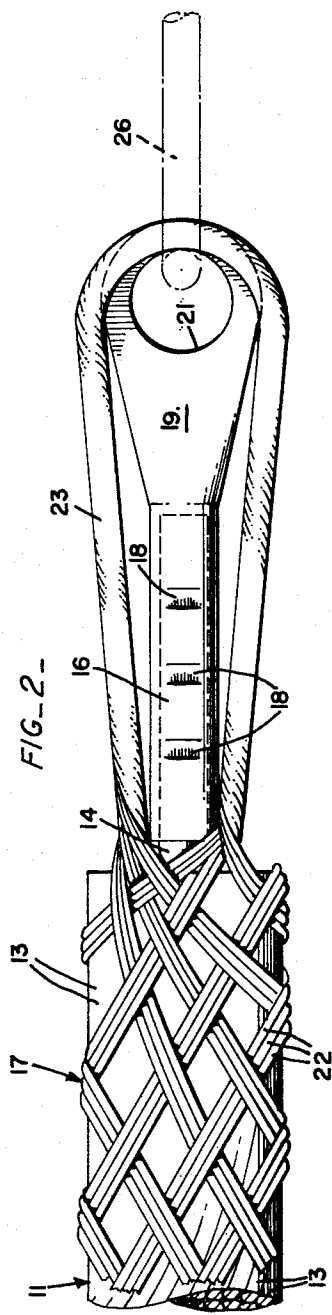
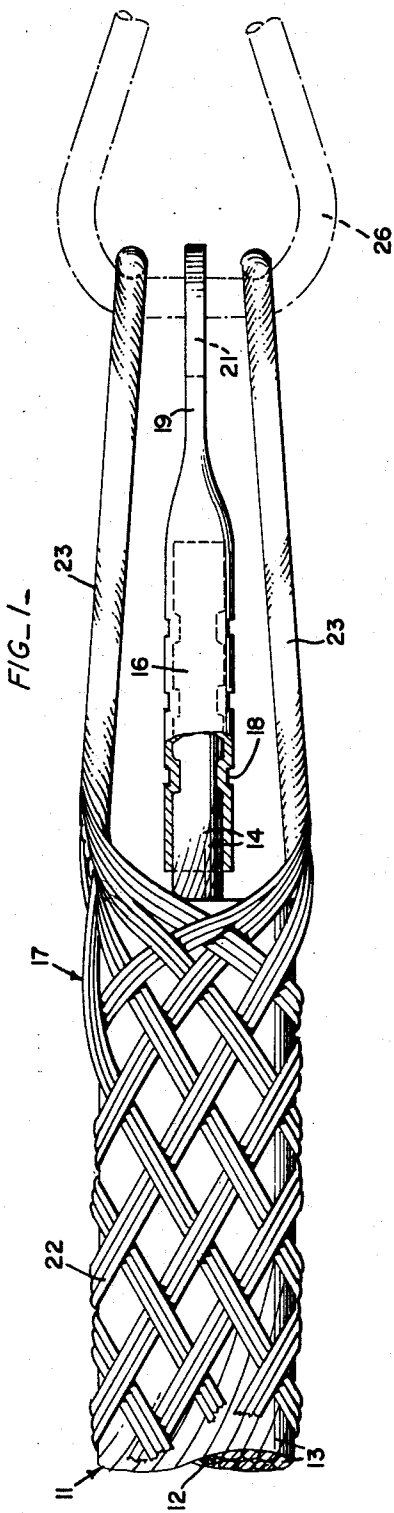
May 19, 1964

W. J. LANUM

3,133,725

STOCKING GRIP FOR CONDUCTOR WITH EYE

Filed Sept. 25, 1961



INVENTOR.
William J. Lanum
BY *Julian Caplan*
ATTORNEY

1

3,133,725

STOCKING GRIP FOR CONDUCTOR WITH EYE
William J. Lanum, Concord, Calif., assignor, by direct
and mesne assignments, of one-half to Gerald A. Peter-
sen, Santa Clara, Calif., and one-half to Anita E.
Petersen, Saratoga, Calif.

Filed Sept. 25, 1961, Ser. No. 140,457

3 Claims. (Cl. 254-134.3)

This invention relates to a new and improved pulling means for cabled conductors having an inner core. More particularly this invention relates to means for applying a pulling force simultaneously to the core and to the outer bundle of conductors. A compression sleeve is applied to the exposed end of the core and a stocking type cable grip to the outer bundle of conductive rods. The sleeve is formed with an eye and the cable grip is woven with a pair of eyes, all three eyes being in alignment to receive a cable or other pulling instrumentality.

The present invention is intended for attachment to a type of conductor in common use made up of a plurality of strands. A central core of wire rope is located at the center of the conductor and imparts increased tensile strength to the conductor. Surrounding the core is at least one layer of helically wound rods of conductive material, such as aluminum or copper. In actual practice there are usually several layers of such rods all concentric with the steel core. The rods are relatively soft and easily damaged, and an important feature of tension stringing is to avoid such damage to the rods either by abrasion upon contact with the ground or by crushing or otherwise abrading the conductors during the pulling operation. The present invention is used in connection with conductors of the type herein mentioned.

The principal purpose of the present invention is to provide means whereby the pulling force of the stringing operation is absorbed both by the central wire rope core and by the exterior strands of the conductor and thereby a greater pulling force may be exerted than could be carried by the steel core, whereas the crushing force applied to the exterior of the conductor is not sufficient to damage the same. Where reconductoring is performed the conductor being removed is likewise protected in the same fashion so that the replaced conductor may be reinstalled in some new location in undamaged condition.

An important result of the present invention, therefore, is to enable the installer of the conductor to use tensions greater than could be sustained either by the steel core itself or by the rods on the exterior of the conductor. Correspondingly, another feature of the invention is the fact that the conductor is not crushed or damaged, nor is the central core stretched beyond its elastic limit during the tension stringing.

Further, the present invention has application in tension stringing of conductors of the aforementioned type whereby overhead conductors are strung while maintained in the air at all times to avoid damage to the conductors. Ordinarily, a pulling line of wire rope is attached to the leading end of the conductor and is then run through stringing sheaves attached to the cross-arms of the poles or towers. Any damage which may occur by reason of contact with the ground is absorbed by the pulling rope. The function of the pulling line is to pull the conductor through the stringing sheaves. In the course of the operation, a pair of bull-wheels is used, one at each end of the line. The conductor is wound from its reel through the tensioner bull-wheel which applies a braking force to the pulling of the conductor while the wire rope is rewound through a puller bull-wheel and then back onto its reel. The bull-wheel on the puller is equipped with power for turning with a force greater than the braking action of

2

the other end of the line and if the equipment is properly operated the conductor never touches the ground at any time during the stringing operation. Thus damage to the conductor is avoided, which is of importance in that such damage results in corona loss and also sets up radio interference at high voltages. Further, the use of tension stringing avoids obstructions such as pre-existing power and telephone lines, roads, streets and railroad tracks which must be traversed by the line being strung. Accordingly, tension stringing is becoming increasingly more important in the construction of electrical transmission lines both for high voltages and for low voltages.

Another modern development in power transmission line stringing arises out of the fact that increased power loads require installation of new conductors over the same right of way. A system of reconductoring is used wherein the pre-existing conductor, which is being replaced, is used in place of the wire rope heretofore mentioned to pull one or more new conductors. The new conductors may be of increased diameter. Further, frequently one conductor is replaced by a plurality of new conductors, usually of the same phase. The present invention finds particular application in reconductoring. However, the present invention may likewise be used in initial installation of conductors.

Other objects of the present invention will become apparent upon reading the following specification, and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a top plan of the structure applied to the end of a conductor with portions broken away to reveal internal construction.

FIG. 2 is a side elevation of the construction of FIG. 1. A commonly used conductor 11 for high voltage currents comprises a central core 12 of wire rope usually consisting of cabled strands of steel wire, surrounded by a plurality of helically laid rods 13 of a highly conductive material such as aluminum or copper. The core 12 provides greater tensile strength than the conductor rods 13. Tension stringing of such conductors 11 is very desirable to avoid damage to the rods upon contact with the ground, etc. for the reasons heretofore discussed. Because the rods 13 are easily crushed and have comparatively less tensile strength than core 12, the tension of the stringing operation has been applied heretofore to the core 12 alone. Such application limits the force which may be applied to the strength of core, taking into consideration conventional factors of safety as well. The present invention applies part of the tension to the core 12 and part to the external strands of rods 13, hence permitting a greater pulling force to be applied.

Preliminarily the conductor is prepared by stripping back the ends of rods 13 for several inches, as by cutting away with a saw, leaving exposed a short length 14 of core.

The pulling means used herein consist of a compression sleeve 16 and a stocking-type cable grip 17. Sleeve 16 is dimensioned to slip over end 14 and is fixed thereto by swedging depressions 18 into sleeve 16 which bite into core 12 or otherwise deforming sleeve 16 to secure the same to end 14. The outer end 19 of sleeve 16 is flattened and enlarged in width and formed with an eye 21.

A common type of cable grip 17 is a stocking type known as the "Kellems" grip. Such a grip consists of a reticulated pattern of strands of wire 22 characterized by the fact that when the ends of the grip are compressed the internal diameter of the grip is increased to slip over the end of the conductor and when the outer end is pulled the internal diameter is decreased, thereby gripping the

3

outer rods 13. The ends of wires 22 are twisted into a pair of eyes 23 extending beyond the ends of rods 13. Eyes 23 are on opposite sides of end 19. The forward edges of eye 21 and of eyes 23 are preferably substantially in alignment.

Pulling the conductor 11 may be accomplished in various ways. One simple means illustrated schematically herein consists of a loop 26 of rope suitably spliced by means not shown to a pulling cable, swivel, running board or cable spreader or the like. Loop 26 passes through both eyes 23 and eye 21. Hence when force is applied to loop 26 it is transmitted partially to compression sleeve 16 and thence to core 12 and partially to grip 17 and thence to rods 13, thereby distributing the load and enabling a greater tension to be applied than if the force were applied either to core 12 or rods 13 alone.

What is claimed is:

1. In combination, a conductor having a central core and a plurality of rods surrounding said core, said core having a projecting portion extending beyond the ends of said rods, a compression sleeve fitting over and secured to said projecting portion and locked on said core, a first eye formed on the forward end of said compression sleeve, a stocking-type pulling grip formed of strands of wire ar-

4

5 ranged in a reticulated pattern and characterized by the fact that longitudinal compression expands said grip to slip over the outside of said rods and longitudinal extension contracts said grip to grip the outside of said conductor, and second and third eyes on the forward end of said grip woven from said strands of wire, all of said eyes being in substantial alignment transverse to said conductor whereby the pulling force of a pulling instrumentality passing through all said eyes is distributed both to said core and to said rods.

2. Means according to claim 1 in which said compression sleeve is formed of a deformable material whereby said sleeve may be deformed to lock onto a core over which it is installed.

3. The combination of claim 1 which further comprises a pulling rope passing through each of said eyes, part of the strain imparted by said pulling rope being transmitted to said core and part to said rods.

References Cited in the file of this patent

UNITED STATES PATENTS

2,434,358	Frank	Jan. 13, 1948
2,650,400	Kellems	Sept. 1, 1953
2,906,987	Fox	Sept. 29, 1959