Oct. 30, 1945. C. N. STOVER 2,388,018

APPARATUS FOR WRAPPING ELONGATED ARTICLES

Filed Jan. 13, 1944 3 Sheets-Sheet 1

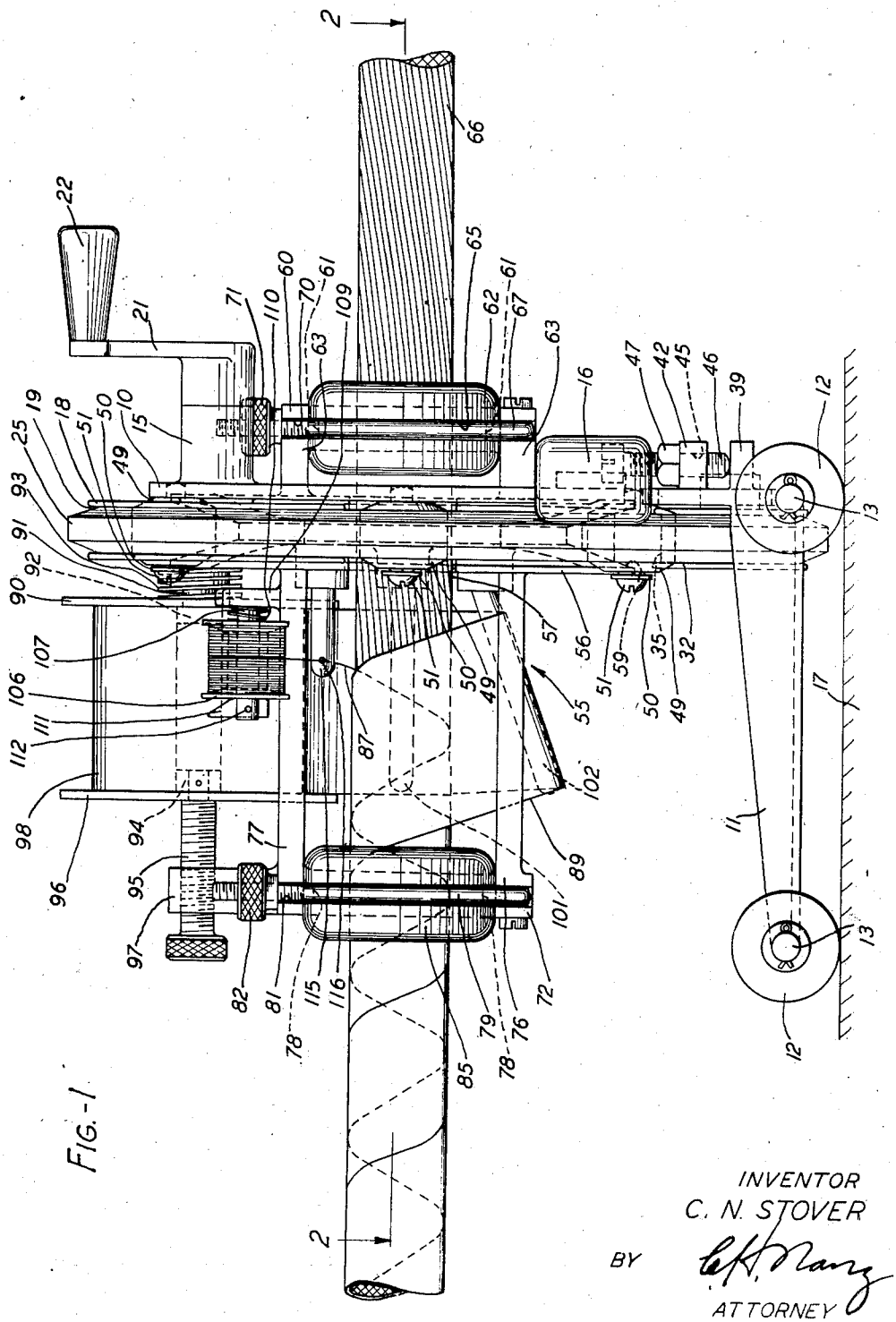


FIG. -1

INVENTOR
C. N. STOVER
BY
ATTORNEY

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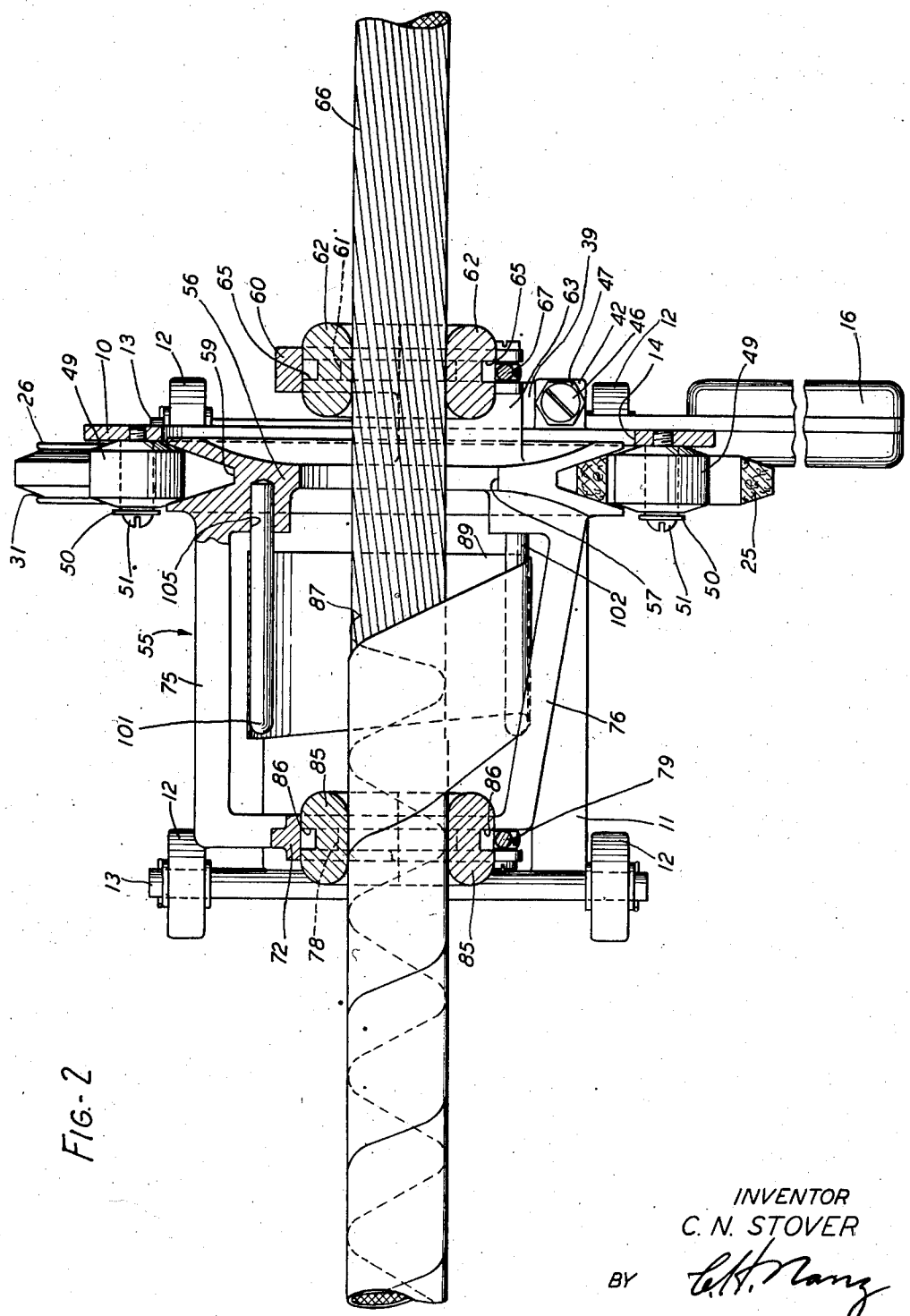


FIG. 2

INVENTOR
C. N. STOVER
BY
ATTORNEY

Oct. 30, 1945. C. N. STOVER 2,388,018

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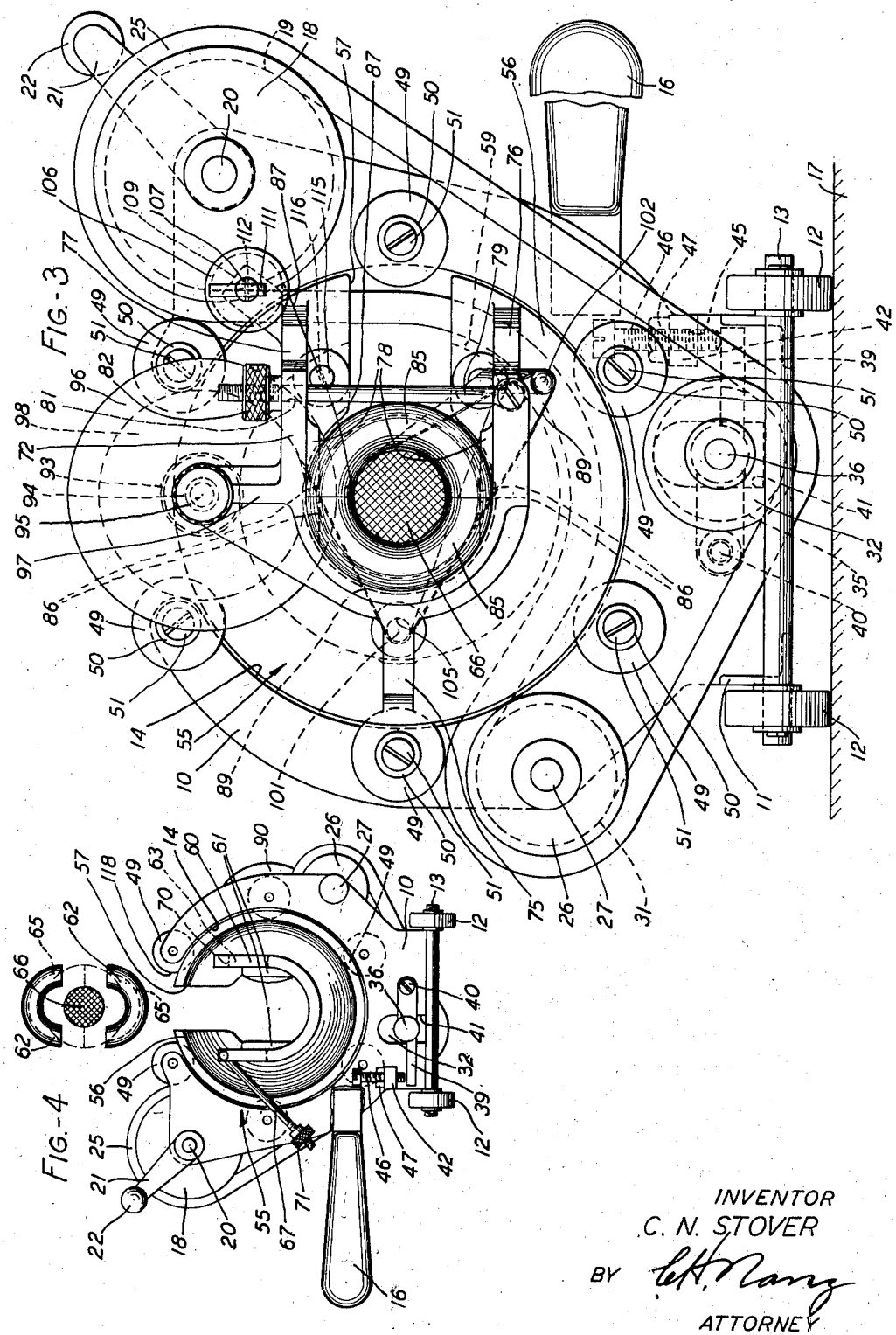


FIG. - 3

FIG. - 4

INVENTOR
C. N. STOVER
BY
ATTORNEY

Patented Oct. 30, 1945 2,388,018

UNITED STATES PATENT OFFICE

2,388,018

APPARATUS FOR WRAPPING ELONGATED ARTICLES

Clyde N. Stover, Towson, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application January 13, 1944, Serial No. 518,072

2 Claims. (Cl. 57—10)

This invention relates to apparatus for wrapping elongated articles, and more particularly to apparatus for serving a binding cord around a plurality of conductors forming part of a cable core and simultaneously wrapping the thus bound conductors with a tape.

One type of communication cable comprises a core made up of a plurality of individually insulated conductors assembled in a predetermined pattern and wrapped with a helical covering of paper tape. It is sometimes necessary to open up such cores and to sever and transpose the conductors therein, and then to splice the transposed conductors together. This operation is known as "cross-splicing" and involves the removal of a considerable length of the paper tape which must be replaced. Usually the spliced conductors are bound together with a cotton cord before the paper tape is applied to the bared portion of cable. The binding and taping operations heretofore have been performed manually, and, therefore, have been time-consuming.

It is an object of this invention to provide new and improved apparatus for wrapping elongated articles.

One embodiment of the invention comprises a device for wrapping elongated articles such as cables, which comprises a wheeled carriage adapted to be moved along a work table or bench, a serving head rotatably mounted on the carriage and having a slot formed therein through which a cable to be wrapped may be inserted, and a spool carrying a supply of cord and a reel for carrying a pad of paper tape both rotatably mounted upon the serving head for serving the cord and tape sequentially around a cable inserted in the apparatus when the serving head is rotated and the carriage is advanced along the cable.

Other objects and features of the invention will be apparent from the following detailed description, taken in connection with the appended drawings, in which

Fig. 1 is a front elevation of an apparatus embodying the invention;

Fig. 2 is a horizontal sectional view thereof taken on the line 2—2 of Fig. 1;

Fig. 3 is an elevation of one end of the apparatus, and

Fig. 4 is a reduced elevation of the opposite end thereof.

Referring now to Fig. 1 of the drawings, a vertical, generally U-shaped frame 10 is rigidly mounted on a carriage 11 which is supported by rollers 12—12 rotatably mounted on axles 13—13 secured to the carriage. The frame 10 has an arcuate opening 14 therein and a bearing 15 is formed thereon at one side near the top thereof. Below the bearing 15 is a handle 16 (Figs. 2, 3 and 4) for propelling the carriage 11 along a work table or bench 17.

A pulley 18 (Fig. 3) having a groove 19 therein is secured on the end of a shaft 20 rotatably mounted in the bearing 15, and a crank 21 with a handle 22 thereon is mounted on the opposite end of the shaft. A belt 25 lies in the groove 19 of the pulley 18 and is driven thereby. A guide pulley 26 is rotatably mounted upon a pin 27 secured to the frame 10 and has a groove 31 which is engaged by the belt 25. A third pulley 32 having a groove 35 therein is rotatably mounted upon a pin 36 secured to an arm 39 which is pivotally mounted on a pin 40 secured to the frame 10. The frame 10 has a slot 41 formed therein through which the pin 36 projects. A lug 42 extending from the frame 10 has a threaded aperture 45 therein through which a bolt 46 is adjustably threaded and secured in position by a nut 47. The lower end of the bolt 46 bears against the arm 39 and forces it downwardly, thereby pressing the pulley 32 against the belt 25 to apply the desired tension to the belt. Thus, the tension of the belt 25 can be regulated by adjusting and securing the bolt 46 with respect to the lug 42.

A plurality of tapered, fiber rollers 49—49 (Fig. 2) are rotatably mounted on an equal number of flanged bushings 50—50 secured to the frame 10 by screws 51—51 arranged around the arcuate opening 14 in the frame and concentric therewith.

Rotatably mounted in the frame 10 is a serving head 55 comprising an annular frame 56 having a transverse opening 57 therein and a V-shaped groove 59, formed in the periphery thereof. The serving head 55 is rotatably secured in the frame 10 by the tapered rollers 49—49 which fit into the V-shaped groove. The belt 25 engages the V-shaped groove 59 in the frame 56 and rotates the frame 56 with respect to the frame 10.

A U-shaped bracket 60 (Figs. 1, 2 and 4) is integrally attached to the frame 56 by means of lugs 63—63 (Figs. 1 and 2). The bracket 60 has tongues 61—61 (Fig. 4) formed on the interior portion thereof. A pair of separable semi-annular guides 62—62 (Fig. 4) have grooves 65—65 in the periphery thereof into which the tongues 61—61 fit to secure the guides against longitudinal movement with respect to the bracket 60 after the guides have been placed around a cable core 66 and inserted therein. A latch 67 pivotally secured to one arm of the bracket 60 is adapted,

when rotated in a clockwise direction as seen in Fig. 4, to engage the guides 62—62 and to enter a slot 70 formed in the other arm of the bracket 60 wherein it may be releasably secured by a nut 71 threaded thereon.

A second U-shaped bracket 72 (Figs. 2 and 3) is secured to the ends of standards 75, 76 and 77, which are integral with the frame 56, and has tongues 78—78 similar to the tongues 61—61 formed on the interior thereof. A latch 79 pivotally secured to one arm of the bracket 72 may be secured in a slot 81 by a nut 82 threaded on the latch 79. The latch retains complementary semi-annular guides 85—85 having grooves 86—86 therein into which fit the tongues 78—78 in the bracket 72. The guides 85—85 enclose the cable core 66 after a cotton cord 87 and paper tape 89 have been wrapped thereon by the serving head.

A disc 90 (Fig. 1) is rotatably mounted upon a pin 91 secured to the frame 56 and is pressed by a coil spring 93 against a bushing 92 mounted upon the pin. A second bushing 94 secures a disc 96 rotatably upon a threaded axle 95 threaded through an aperture in a lug 97 projecting from the bracket 72.

The discs 90 and 96 and the bushings 92 and 94 form a reel for holding a roll 98 of the paper tape 89. The tension upon the tape 89 as it is drawn from the roll 98 may be regulated by screwing the axle 95 farther into or out of the aperture in the lug 97 to vary the compression of the spring 93. The tape is passed around guide pins 101 and 102 (Fig. 2) to the cable core 66. The pin 101 is driven into an aperture 105 (Fig. 2) formed in the frame 56 at such an angle with respect to the roll 98 that the tape 89 drawn therefrom will lie flat against the pin 101 as the carriage 11 is moved along the cable core 66 and the tape will be applied to the cable core at a pitch proportional to the relative movement between the roll 98 and the cable core 66. The second pin 102 is also positioned on the frame 56 so that the entire width of the tape 89 lies thereagainst during the wrapping of the tape around the cable core 66.

The cord 87 is drawn from a supply spool 106 rotatably mounted upon a spindle 107 secured to a lug 109 integral with the standard 77. A coil spring 110 presses the spool 106 against a latch 111 which is pivotally mounted upon a pin 112 passing through the spindle 107 whereby the rotation of the spool 106 will be retarded sufficiently to apply tension to the cord 87 as it is wrapped around the cable core. A pin 115 (Fig. 1) is mounted on the frame 56 and has an aperture 116 therethrough through which the cord 87 is guided to the cable core 66 at a point thereon in advance of that at which the tape 89 first contacts the cable core.

In the operation of the above-described apparatus, the frame 56 is rotated to the position relative to the frame 10, shown in Fig. 4, with the opening 57 in the frame 56 and the open ends of the U-shaped frame 10 and the brackets 60 and 72 in alignment. The cable core 66 to be wrapped is laid upon the bench 17 and the apparatus is placed adjacent thereto near the left edge of that portion of the cable which is to be wrapped, as viewed in Figs. 1 and 2, with the axis of the opening 14 parallel to the longitudinal axis of the cable core. The cord 87 is then threaded through the guide aperture 116, and the tape 89 is threaded around the pins 101 and 102 and the cable core 66.

The semi-annular guides 85—85 are placed around a covered portion of the cable core 66 and are inserted into the bracket 72 with the tongues 78—78 fitting into the grooves 86—86 therein to prevent movement of the guides 85—85 longitudinally with respect to the axis of the bracket 72. The latch 79 is then swung over into engagement with the slot 81 and is secured in that position by tightening the nut 82 thereon to hold the guides 85—85 in the bracket 72.

The guides 62—62 are placed around the uncovered portion of the cable core 66, in the position shown in dotted lines in Fig. 4 of the drawings, and are inserted in the bracket 60 and are secured therein by the tongues 61—61 and the latch 67 in a manner similar to that in which the guides 85—85 were secured, as has been described just above.

The operator then grasps the handle 16 with his left hand and slowly rolls the device along the bench 17 in the direction of the unwrapped portion of the cable core 66, that is, toward the right, as seen in Figs. 1 and 2. With his other hand the operator rotates the crank 21 in a clockwise direction, as seen in Fig. 4, which causes the serving head 55 to revolve around the cable core 66 through the belt 25 which engages the groove 59 in the periphery of the frame 56. The frame 56 is kept concentric with respect to the cable core during its rotation therearound by the rollers 49—49 which fit into the groove 59 at spaced points about the periphery thereof. The spool 106 and the roll 98 are revolved around the cable core 66 with the frame 56 to successively wrap the cord 87 and the tape 89 around the cable core, the pins 115, 101 and 102 guiding the cord and tape as they are applied.

Since the apparatus is moved toward the unwrapped portion of the cable core 66 and the guide aperture 116 is positioned to the right of the right edge of the tape 89, as viewed in Fig. 1, as it is wrapped on the cable core 66, the cord 87 is first placed upon the bare portion of the cable core 66 and the tape 89 is wrapped thereover. The springs 93 and 110 retard the rotation of the roll 98 and the spool 106, respectively, as the cord 87 and the tape 89 are drawn therefrom, whereby the cord and the tape are kept under tension and are tightly wrapped around the cable core. The guides 85—85 are revolved with the bracket 72 around the wrapped portion of the cable in the same direction that the cord 87 and the tape 89 were wrapped thereon and thereby smooth and tighten the wrappings of cord and tape thereon. The bracket 60 and the guides 62—62 also revolve around the cable and compress and smooth the unwrapped portion thereof.

The pitch of the wrappings of the cord 87 and tape 89 upon the cable core 66 will depend, of course, on the speed at which the spool 106 and the roll 98 are revolved around the core relative to the speed the apparatus is moved longitudinally along the core, and it may be varied at the will of the operator. After as much of the cable as desired has been wrapped, the operator removes the cable from the guides 85—85 and 62—62, cuts unwrapped portions of the cord 87 and the tape 89 adjacent to the cable, and secures the loose ends of the tape and cord against unravelling by any well known method, such as by wrapping with a cord or a gum covered tape.

Other guides having different internal diameters may, of course, be substituted for the guides 85—85 and 62—62 so that the device may be used to wrap cables of different sizes.

The use of the wrapping device embodying the invention produces smooth, tight, uniform wrappings of both the cord and the tape on cables by only one operation of the device on each cable and is highly efficient and time-saving in producing wrapped cables of uniform high quality.

What is claimed is:

1. In an apparatus for wrapping cable splices, a wheeled carriage, an upright frame having an arcuate aperture therein secured to the carriage, a handle attached to the frame, a plurality of similar guide rollers rotatably mounted upon the frame in an arcuate path concentric with the aperture in the frame with a portion of each of the guide rollers projecting into the aperture, a serving head having a slot therein through which a cable splice to be wrapped may be inserted and also having a groove in the periphery thereof, a plurality of split bushings removably secured to the head for securing such a cable splice against transverse movement, a cord serving spool mounted upon the head, a guiding member for guiding a cord from the cord serving spool to the cable splice, a tape serving spool mounted upon the head, guiding means for guiding a tape from the tape serving spool to the cable splice, a drive pulley mounted on the frame, a plurality of guide pulleys attached to the frame, and a belt fitting into the groove in the serving head and passing around the drive pulley and the guide pulleys for rotating the head and the spools thereon around the cable splice as the carriage is moved along the cable, one of said guide pulleys being adjustably mounted on the frame to regulate the tension of said belt.

2. In an apparatus for wrapping cable splices, a wheeled carriage, an upright frame having an arcuate aperture therein secured to the carriage, a handle attached to the frame, a plurality of similar guide rollers rotatably mounted upon the frame in an arcuate path concentric with the aperture in the frame with a portion of each of the guide rollers projecting into the aperture, a serving head having a slot therein through which a cable splice to be wrapped may be inserted and also having a groove in the periphery thereof, a plurality of split bushings removably secured to the head for securing such a cable splice against transverse movement, a cord serving spool mounted upon the head, a guiding member for guiding a cord from the cord serving spool to the cable splice, a tape serving spool mounted upon the head, guiding means for guiding a tape from the tape serving spool to the cable splice, a drive pulley mounted on the frame, a plurality of guide pulleys attached to the frame, and a belt fitting into the groove in the serving head and passing around the drive pulley and the guide pulleys for rotating the head and the spools thereon around the cable splice as the carriage is moved along the cable.

CLYDE N. STOVER.