

May 24, 1927.

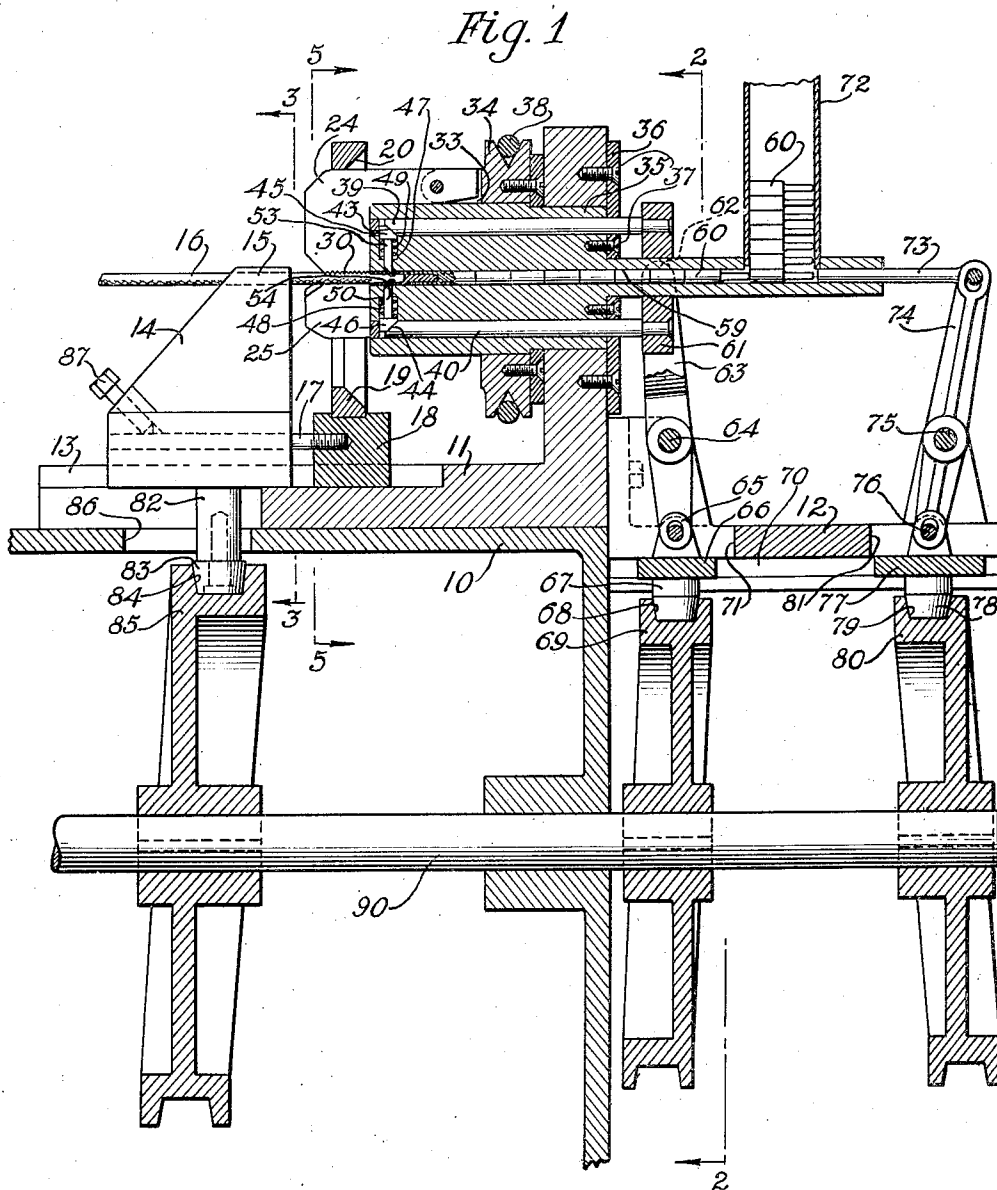
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1,629,694

APPARATUS FOR AND METHOD OF APPLYING TIPS TO CORES

Filed Aug. 9, 1924

3 Sheets-Sheet 1



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Fig. 2

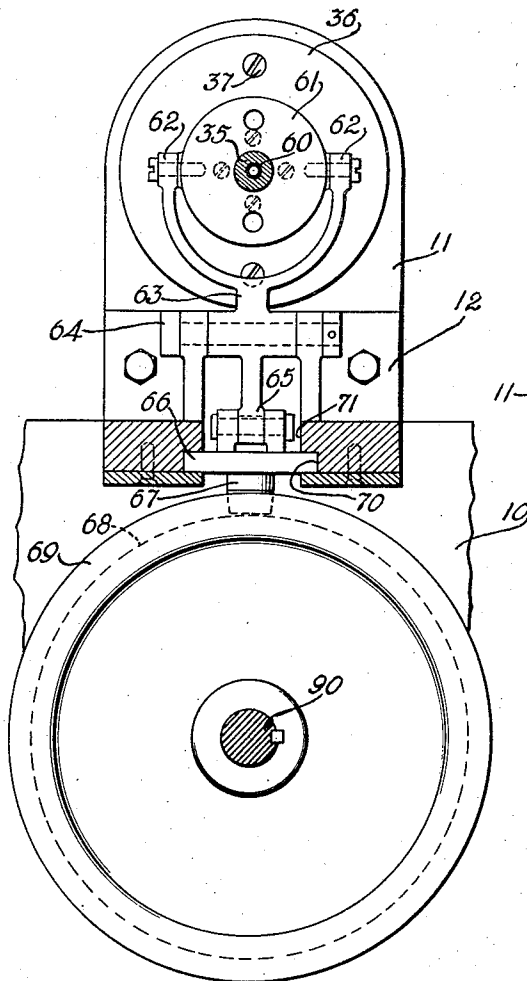


Fig. 3

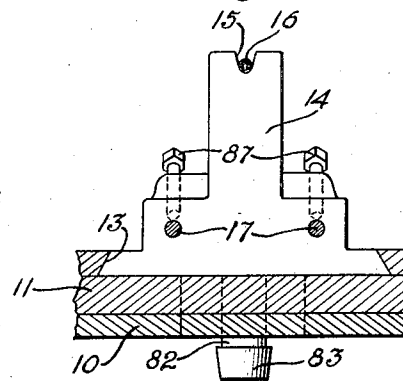
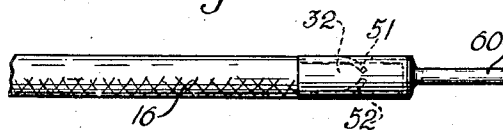


Fig. 7



Fig. 6



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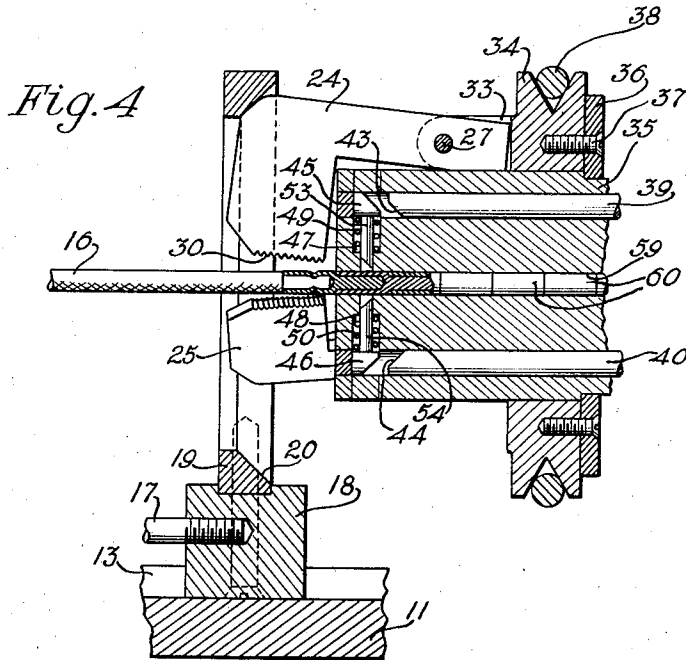
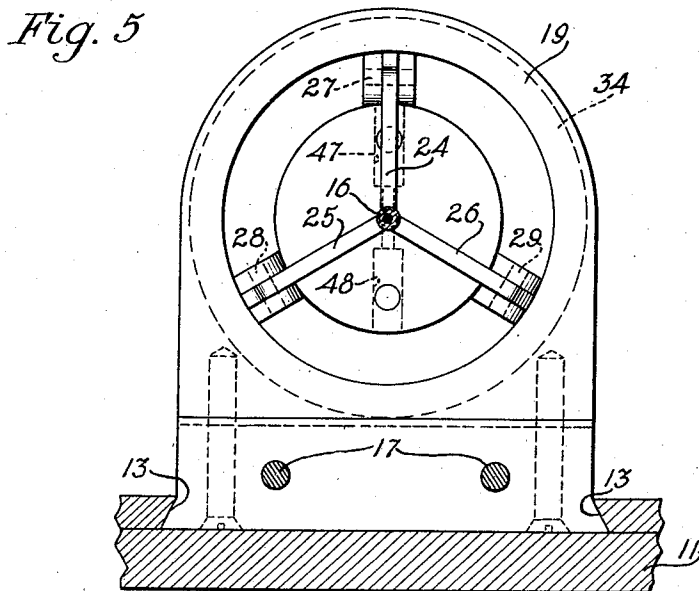
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3 Sheets-Sheet 3



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1,629,694

UNITED STATES PATENT OFFICE.

BEN KING FORD, OF OAK PARK, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

APPARATUS FOR AND METHOD OF APPLYING TIPS TO CORES.

Application filed August 9, 1924. Serial No. 731,230.

This invention relates to an apparatus for and a method of applying a tip to a core, and more particularly to an apparatus for and a method of attaching tubular tips or terminals to electrical conductors.

An object of this invention is to provide an improved mechanism for and an improved method of applying tips to cores.

In accordance with the general features of the invention there is provided a reciprocable cord support associated with a plurality of threaded jaws for receiving and compressing the cord and which upon being rotated carry the cord into a tip which has been positioned to receive the cord. Mechanism is provided whereby after the end of the cord has been inserted into the tip, prongs are formed in the tip and are forced through the insulation of the cord into the conductor of the cord, insuring an electrical contact therebetween and securing the tip to the cord.

Other objects and advantages of the invention will more fully appear from the following detailed description taken in connection with the accompanying drawings which illustrate one embodiment thereof, and in which

Fig. 1 is a fragmentary vertical section through the center of the machine;

Fig. 2 is a sectional view taken on the line 2-2 of Fig. 1 looking in the direction indicated by the arrows;

Fig. 3 is a view taken on the line 3-3 of Fig. 1 looking in the direction of the arrows;

Fig. 4 is an enlarged detail view of a portion of Fig. 1;

Fig. 5 is a section taken on the line 5-5 of Fig. 1;

Fig. 6 is an enlarged view of the cord with a tip applied thereto, and

Fig. 7 is a plan view of the cord and tip shown in Fig. 6.

It is believed that the improved method of applying tubular tips to cords will be readily understood from the following description of an apparatus by which it may be performed.

Referring now to the drawings in detail in which like reference numerals designate similar parts throughout the several views, 10 denotes a supporting member which may be suitably positioned and carried by a bench (not shown). Located on the top of the

supporting member 10 is a frame 11 of the machine on the side of which is secured a member 12. Reciprocably mounted in a keyway 13 in the frame 11 is a cord support 14 having a V-shaped groove 15 in its top surface in which is placed a cord 16. Extending through the lower part of the cord support 14 are two threaded pins 17 which are screwed into a block 18 which also rides in keyway 13. Integral with the block 18 is a ring 19 having a countersunk bore 20 (Fig. 4) which is adapted to engage the beveled edges of jaws 24, 25, and 26 (Figs. 4 and 5). The jaws 24, 25, and 26 are pivotally mounted at points 27, 28, and 29 in the hub 33 of a pulley 34 and form a threaded orifice 30.

The pulley 34 is loosely mounted on a member 35 which is held in a stationary position by a plate 36 and bolts 37 which connect the member 35 with the frame 11. The pulley 34 is adapted to be rotated by any suitable means such as a belt 38.

Extending through the member 35 are two pins 39 and 40 which have beveled ends 43 and 44, respectively, (Fig. 4). The end 43 is adapted to engage a beveled element 45 at right angles and the end 44 is adapted to engage a beveled element 46 at right angles. Located at right angles to the pins 39 and 40 are two countersunk bores 47 and 48 in each of which is located a compression spring 49-50. Passing through the compression spring 49 is a tool 53 which is integral with element 45. Passing through the spring 50 is a similar tool 54 which is integral with the element 46.

Extending through the center of member 35 is a hole 59 in which is positioned a train of tips 60. The pins 39 and 40 are carried in a ring 61 (Figs. 1 and 2) which is straddled by a forked end 62 of lever 63. The lever 63 is pivotally mounted intermediate its ends on pin 64 carried by the member 12. The other end 65 of lever 63 is pivoted to a reciprocable plate 66, (Figs. 1 and 2) carrying a pin 67 which rides in groove 68 of a cam 69; the plate 66 is adapted to be reciprocated in a keyway 70 formed in the member 12. Positioned above the bore 59 and to the rear of the ring 61 is a feed chute 72 from which the tips 60 are fed into the bore 59 by gravity as shown in Fig. 1. Located in the extreme end of bore 59 is a reciprocable pin 73 pivotally secured to lever

74 which is pivoted intermediate its ends at point 75 to the member 12. The other end of lever 74 is pivotally mounted at point 76 (Fig. 1) to a reciprocable plate 77 which also rides in the keyway 70. Secured to this plate is a pin 78, similar to pin 67, which rides in groove 79 of cam 80. It will be noted that the member 12 is provided with two slots 71 and 81 permitting levers 63 and 74 to reciprocate with plates 66 and 77, respectively.

Formed on the under surface of cord support 14 is a stud 82 which carries a pin 83 riding in a groove 84 of a cam 85. The stud 82 moves in a slot 86 formed in the supporting member 10. Passing through the cord support at an angle to the pins 17 are two adjusting screws 87 which are adapted to be brought into contact with the pins 17 to lock the support 14.

The cams 85, 69, and 80 are all keyed to a shaft 90 which may be driven by any suitable source of power (not shown) and which may be set in motion by any usual type one revolution clutch (not shown) actuated by the operator.

The operation of the mechanism is as follows: The telephone cord 16 is placed on the cord support 14 with its end in the opening (Fig. 1) formed by the jaws 24, 25, and 26, ready to be moved into the threaded orifice 30 formed by the jaws.

It will be noted that by loosening screws 87 the support 14 may be moved longitudinally in the keyway 13 so as to vary the distance between the cord support 14 and the block 18, thus enabling this machine to be used for applying tips of various lengths to cords. The hole 59 is then filled with tips 60 (Fig. 1), one being positioned ready for the end of the first cord to be inserted therein and the others being arranged thereafter in the hole 59, the last one in the hole 59 registering with the pin 73. The last tip in the hole 59 is in alignment with the tips 60 in the chute 72 so that by one forward movement of the pin 73 the last tip in the hole 59 will be moved forward a distance just sufficient to permit another tip to drop from the feed chute 72 into the hole 59.

The operator then applies power to the belt 38 causing the pulley 34 to revolve, and at the same time sets in motion a one revolution clutch which permits the shaft 90 to be revolved one complete revolution. It is, of course, apparent that upon the application of power to the pulley 34 the jaws 24, 25, and 26 through centrifugal force are caused to pivot outwardly as best shown in Fig. 4 forming a frusto-conical like die or hole. The cams 85, 69, and 80 are so arranged and timed that upon the application of power to the shaft 90 they will function in a predetermined manner. The cam

85 in revolving moves the cord support 14 and the cord 16 held thereon by the operator forward, the end 32 of the cord 16 entering the orifice 30 formed by the jaws. As soon as the end of the cord 16 has entered the orifice 30, the surface of the bore 20 of the ring 19 comes in contact with the beveled ends of the jaws causing them to close upon the end of the cord. The jaws 24, 25, and 26 in closing on the end of the cord compress and guide it so that the cord support 14 in moving forward forces it directly into the tip 60 previously positioned.

Upon the insertion of the end 32 of the cord 16 into the tip 60 the cam 69 through lever 63 moves the ring 61 forward which carries the pins 39 and 40 forward. The beveled ends 43 and 44 of the pins come in contact with the beveled sides of elements 45 and 46, respectively, causing the springs 49 and 50 to be compressed and resulting in the points of the tools 53 and 54 penetrating the sides of the tip, forming prongs 51 and 52 (Figs. 6 and 7). These prongs 51 and 52 are forced through the braided insulation of the cord 16 into the electrical conductors of the cord 16, clenching the tip 60 to the cord 16 and also insuring a good electrical contact between the conductors and the tip 60. Furthermore, it will be noted that the prongs 51 and 52 are triangular in shape and that they penetrate the conductor of the cord at right angles to the direction of the cord in such a manner that any tendency to pull the cord out of the tip will only serve to force the prongs further into the conductor.

Cams 85 and 69 are so designed that after the tip 60 has been secured to the cord 16 they cause cord support 14 and lever 63, respectively, to be returned to their original positions. It is, of course, apparent that by returning the cord support 14 to its original position the jaws are left free to pivot outwardly, permitting the cord 16 and the tip 60 in its final assembled position to be easily withdrawn with the cord support 14.

The shaft 90 in completing the revolution through cam 80 causes lever 74 to reciprocate pin 73 pushing the train of tips 60 forward a distance just sufficient so that another tip 60 will replace the tip that has been used. After the pin 73 has returned to its normal position a tip 60 drops from feed chute 72 into the hole 59.

What is claimed is:

1. In a mechanism for applying a tip to a core, a plurality of jaws forming a frusto-conical die which is adapted to compress and guide the end of the core into the tip, and means for forcing the core through the die formed by the jaws into the tip.

2. In a mechanism for applying a tip to a core, a support for the core, means for compressing the end of the core, and means for

moving the core support to carry the end of the core into the compressing means and to thereafter force it into the tip.

3. In a mechanism for applying a tip to a core, a support for the core, means for compressing the end of the core and for guiding it into the tip, means for positioning the tip, and means for moving the core support to carry the end of the core through the compressing means and to thereafter force it into the tip.

4. In a mechanism for applying a tip to a core, a support for the core, means for compressing the end of the core and for guiding it into the tip, means for positioning the tip, means for moving the core support to carry the end of the core through the compressing means and to force it into the tip, and means for securing the tip to the core.

5. In a mechanism for applying a tip to an electrical conductor, a support for the conductor, means for compressing the end of the conductor and for guiding it into the tip, means for positioning the tip, means for moving the support to carry the end of the conductor through the compressing means and to force it into the tip, and clenching means for securing the tip to the conductor in such a manner as to insure a good electrical contact between the tip and the conductor.

6. In a mechanism for applying a tip to an electrical conductor, a support for the conductor, means for compressing the end of the conductor and for guiding it into the tip, means for positioning the tip, means for moving the support to carry the end of the conductor through the compressing means and to force it into the tip, and means for forming prongs in the tip and forcing them into the conductor insuring an electrical contact therebetween and securing the tip to the cord.

7. In a mechanism for applying a tip to an electrical conductor, a support for the conductor, means for compressing the end of

the conductor and for guiding it into the tip, means for positioning the tip, means for moving the support to carry the end of the conductor through the compressing means and to force it into the tip, means for securing the tip to the conductor, and means for supplying tips in a continuous train.

8. In a mechanism for applying a tip to an electrical conductor, a support for the conductor, means for compressing the end of the conductor and for guiding it into the tip, means for positioning the tip, means for moving the support to carry the end of the conductor through the compressing means and to force it into the tip, means for forming prongs in the tip and forcing them into the conductor insuring an electrical contact therebetween and securing the tip to the cord, and means for supplying tips in a continuous train to the positioning means.

9. A method of applying a tip to a core, which consists in positioning a tip upon the core, partially severing a portion of the positioned tip, forming such portions into a fastening element, and forcing the element into the core.

10. A method of applying a tip to a core, which consists in positioning a tip having an imperforate wall upon the core, perforating the wall to partially sever a portion therefrom, forming such portion into a prong, and forcing the prong into the core to secure the tip to the core.

11. A method of applying a tip to an insulated electrical conductor, which consists in positioning a tip having an imperforate wall upon the end of the insulated conductor, perforating the wall to partially sever a portion therefrom, forming such portion into a prong and forcing the prong through the insulation into the conductor to secure the tip to the conductor and to insure an electrical contact therebetween.

In witness whereof, I hereunto subscribe my name this 31st day of July, A. D., 1924.

BEN KING FORD.