March 10, 1942. M. T. MALLARD 2,275,858

TAPING DEVICE

Filed Sept. 25, 1940

Fig. 1

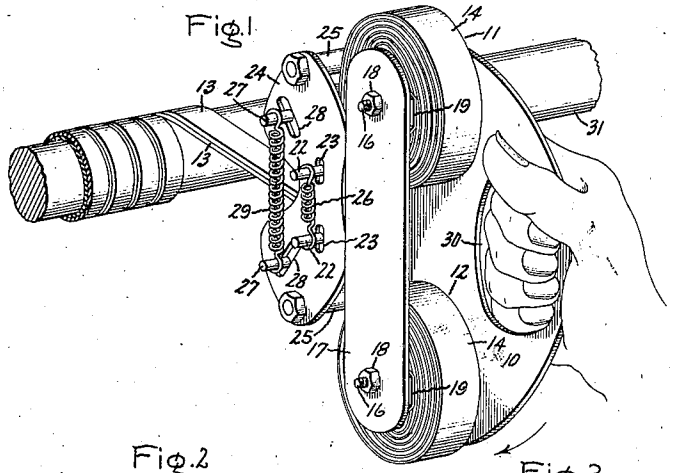


Fig. 2

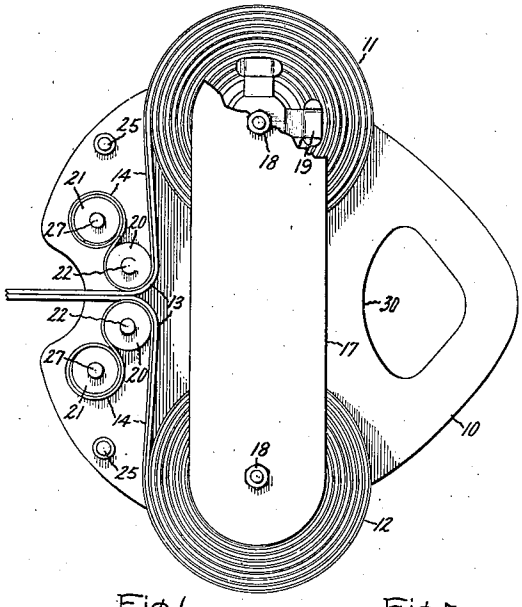


Fig. 3

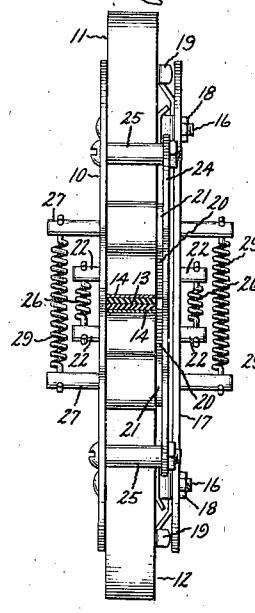


Fig. 4

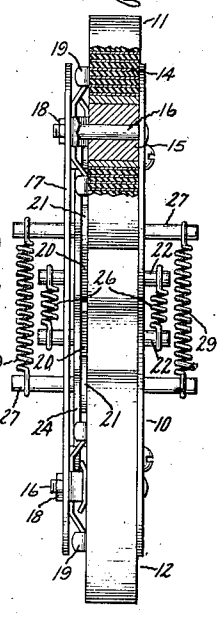


Fig. 6

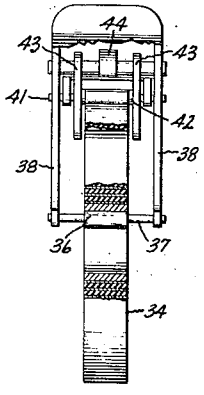
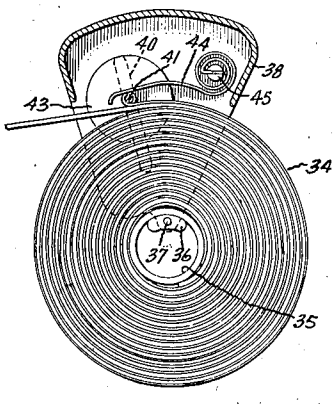


Fig. 5



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UNITED STATES PATENT OFFICE

2,275,858

TAPING DEVICE

Manley T. Mallard, Fairfield, Conn., assignor to General Electric Company, a corporation of New York

Application September 25, 1940, Serial No. 358,271

2 Claims. (Cl. 242—55)

My invention relates to a taping device, and more particularly to a taping device for applying insulating tape to electric cables.

Cable splices usually include an insulating layer applied in the form of a tape. Such taping operations are frequently difficult, particularly in those cases where one or more tapes must be applied simultaneously, as in the case of self-vulcanizing tapes, because it is difficult for a single operator to wrap the tapes simultaneously around the cable. Moreover, insulating tapes are usually provided with a cloth separating layer between the adjacent wrappings of the tape which must be removed as the roll of tape is moved around the cable to apply the tape to the joint. In such cases the operator must stop at frequent intervals to remove the cloth separator tape, or else run the risk of having the separator becoming entangled with the insulating tape. My invention overcomes these difficulties and makes possible the simultaneous application of a plurality of insulating tapes without interference from the separator tapes. The same result is attained when only a single insulating tape is being applied.

It is an object of my invention to provide means for simplifying the operation of applying a roll of insulating tape having a separator tape in that the separator tape is automatically wound up on a reel so that it is at all times out of the way of the insulating tape to facilitate winding of the latter around the cable joint.

It is another object of my invention to provide means whereby a plurality of insulating tapes may be applied simultaneously to a cable, provision being made for removing a plurality of the separating tapes as the insulating tapes are wound around the cable.

It is a further object of my invention to provide a supporting means for a roll of insulating tape whereby the latter may be rotated around the cable easily and quickly to apply a layer of tape to a cable.

In the accompanying drawing, Fig. 1 is a perspective view of my device showing it in position for applying a plurality of insulating tapes to a cable; Fig. 2 is a side view of the device with a portion broken away; Fig. 3 is an end view of the device looking to the right of Fig. 2; Fig. 4 is an end of the device looking to the left of Fig. 2; Fig. 5 is a view of a modified form of my invention; and Fig. 6 is an end view of the device of Fig. 5.

Referring to the drawing, my taping device includes a holder plate 10 for supporting a plurality of rolls 11 and 12 of insulating tape. Each roll comprises a tape of insulating material 13 and a separator tape 14, the two tapes being wound simultaneously around a core 15, so that the adjacent layers of the insulating tape are spaced from one another by the separator 14. Customarily, the separator tape is formed of fabric such as cloth. Were it not for the separator tape the layers of insulating tape would fuse or stick together, making removal from the roll difficult. The insulating tape 13 may be formed of any well known rubber compound suitable for use as insulation on an electric cable, or it may be any of the well known forms of friction tape impregnated with an asphaltic compound. In the case of self-vulcanizing tapes, one of the tapes carries the vulcanizing material while the other carries the accelerator, so that as the tapes are applied simultaneously in superposed relation, a chemical reaction between them takes place curing the rubber layer thus formed in place.

Each of the rolls 11 and 12 is mounted on the main holding plate 10 by slipping it on a pin 16 which permits rotation of the roll of tape. The rolls are maintained in position by a bearing plate 17 which overlies them and rests on the pins 16. This plate is held in position by nuts 18 threaded on to the pins 16. A spring bearing member is placed between each of the rolls 11 and 12 and the holding plate 17 to take up any slack movement between the supporting plate and the rolls of tape. To this end, the spring bearing member is formed with a plurality of flexible radially extending arms 19 engaging the side walls of the roll. Replacement of the rolls on the holder is accomplished simply by removing the nuts 18 and the bearing plate 17.

Referring more particularly to Figs. 1 and 2, the free ends of the tapes on each roll are passed through a space between two opposed rollers 20, and the separator tapes 14 are then wound around second rollers 21 immediately adjacent the corresponding rollers 20 so that these tapes are in position to be wound up on the rollers 21. The rollers 20 and 21 are formed of a size and width to receive the tapes. The insulating tapes are drawn straight through the rollers 20 for engagement with the work. The rollers 20 are rotatably mounted on bearing pins 22. At one end the pins 22 are slidably mounted in slots 23 formed in a supporting plate 24 which is secured in spaced relation to the main holding plate 10 by bolts 25. At their other ends, the pins 22 are likewise mounted in slots (not shown) in the holding member 10 which correspond in location

and size to the slots 23. The pins 22 are movable transversely through the elongated slots 23 and are normally biased toward each other by springs 26 which are clipped around each end. This means that the rollers 20 are biased toward each other at all times so that they are brought into frictional engagement with the insulating and separator tapes 13 and 14 which pass between the rollers. In initially inserting the tapes between the rollers, they are spread apart against the action of the springs 26 so that thereafter they frictionally engage the tapes.

Similarly, the rollers 21 are rotatably supported on pins 27 which are slidable transversely through elongated slots 28 formed in the holding plate 10 and the supporting plate 24. As shown by Fig. 1, the slots 28 are inclined at an angle so that as the pins 27 move laterally therethrough the rollers 21 are moved into and out of engagement with the rollers 20. The pins are spring biased to move the rollers 21 into frictional engagement with the rollers 20 by means of springs 29 clipped around the outer ends of the pins.

After the separator tape 14 of each roll is slipped between the rollers 20 it is wound around a corresponding roller 21 in a reverse direction between the roller 20 and the roller 21 and is slipped under an overlying convolution so that winding of the separator tape on the roller 21 is initially begun. As the insulating tapes 13 are pulled between the rollers 20 the rollers are caused to rotate due to their frictional engagement with the outer separator tape 14 so that the rollers 21 are caused to rotate in the opposite direction due to their frictional cooperation with the rollers 20 under the influence of the springs 29.

Rotation of roller 20 drives the roller 21 even though the tape 14 is between the rollers due to the fact that the springs 29 bias the roller 21 toward the roller 20. This means that as the rollers 20 and 21 rotate in opposite directions the separator tape 14 is wound up on the roller 21, as shown by Fig. 2. The amount of tape wound up on the roller 21 is compensated for by movement of the supporting pins 27 transversely of the slots 28 against the action of the biasing spring 29. Movement of the pins 22 within the slots 23 is simply to compensate for tapes of varying thicknesses passing between the rollers 20. If desired the rollers 20 may be provided with knurled or serrated surfaces for increasing the frictional grip on the tapes thereby preventing slippage. An opening 30 in the holding plate 10 forms a grip portion for the hand of an operator.

One use of the device is in applying an insulating covering to a cable 31. The device is particularly useful in those cases where it is desired to applying two self-vulcanizing insulating tapes simultaneously. In such cases it was formerly necessary to move both of the rolls of tape individually around the conductor and, at the same time, remove the separator tapes on each of the rolls to prevent interference with the wrapping operation. Frequently, this required the services of more than one operator. By my construction, however, both rolls of tape are mounted on the holder and the holder itself is moved by a single operator completely around the conductor, in the direction shown by the arrow in Fig. 1. As the insulating tapes are pulled between the rollers 20 during winding on the electric conductor, the rollers 20 are rotated causing corresponding rotation of the rollers 21 to wind up the separator tapes 14. The rollers 20 act to bring the self-vulcanizing tapes into intimate contact under the action of the springs 26 thereby increasing the effectiveness of the vulcanization. While the holder has been shown as supporting two rolls of self-vulcanizing tapes for simultaneous application to the conductor, it should be manifest that the device will work equally as well if only a single roll were mounted thereon.

My device greatly increases the speed and effectiveness with which insulating tapes may be wrapped around electric conductors. Since the separator tape is wound up automatically on the roll 21 it is unnecessary for the operator to stop and tear off this tape such as has been necessary heretofore. Moreover, it is possible to apply the insulating tape evenly and with uniform tension because the holder may be moved continuously around the cable without interference from the separator tape and without stopping to tear it off. Since the separator tape is wound on the reel 21 it does not become entangled with the main insulating tape thereby increasing the speed of application. My device greatly increases the safety of the operator in working around live wires since the various rolls of insulating tape are mounted on a single holder so that the tapes may be applied simultaneously and expeditiously.

Figs. 5 and 6 of the drawing illustrate a form of my invention which is particularly adapted for use with a single roll of insulating tape such as a roll of rubber tape 34 commonly employed in protecting soldered connections of conductors. Such rubber tapes are usually wound on a cylindrical core 35. The core 35 receives a bearing member 36 mounted on a pin 37 supported by opposite sides of a housing 38. The roll is mounted on the holder simply by removing the pin 37, which is frictionally held by the housing, and inserting it together with the bearing member 36 through the core. Opposite walls of the housing are provided with elongated slots 40 supporting a pin 41 on which is rotatably mounted a roller 42 in the form of spool having end flanges 43. A coil spring 44 is supported at one end on a bar 45 supported by the housing; the other end of the spring resiliently engages the spool 42 to press it into frictional engagement with the separator tape 14 on the associated roll 34. As the insulating tape 13 is unwound from the roll the latter rotates about the bearing member 36 and since the spring 44 maintains the spool 42 in frictional engagement with the separator tape, this tape is wound up on the spool. This provides a very simple construction which is most effective in winding up the separator tape and keeping it out of the way of the operator as the insulating tape is applied to the conductor. Variations in the amount of separator tape wound on the spool are compensated for by lateral movement of the pin 41 in the elongated slot 40.

While my invention has been shown, by way of example, for use in applying insulating tapes to electric cables, it should be manifest that it may be used with other forms of tape and may be used in any case where it is desired to maintain a separator tape removed from a main tape.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A winding device for use with a plurality of rolls each formed of two tapes wound in superposed relation comprising, in combination, a support, means rotatably mounting the rolls on said support, spaced guide rollers mounted on said support and biased toward each other for receiving the tapes from each roll therebetween, and a

reel associated with each guide roller for receiving one tape from each roll, movement of said tapes between said guide rollers driving the respective reels to wind the first-mentioned one tape thereon as the other tapes from the rolls are simultaneously removed therefrom.

2. A winding device for use with a plurality of rolls each formed of two tapes wound in superposed relation comprising, in combination, a support, means rotatably mounting the rolls on said support, spaced guiding means comprising rolls spring biased toward each other and adapted to receive the tapes from the respective rolls therebetween, a reel associated with each guide roll, spring means for biasing said reels into frictional cooperation with a respective guide roll, said reels being rotated by movement of the tape through said guide means between the rolls for automatically rewinding one tape from each roll upon a respective reel.

MANLEY T. MALLARD.