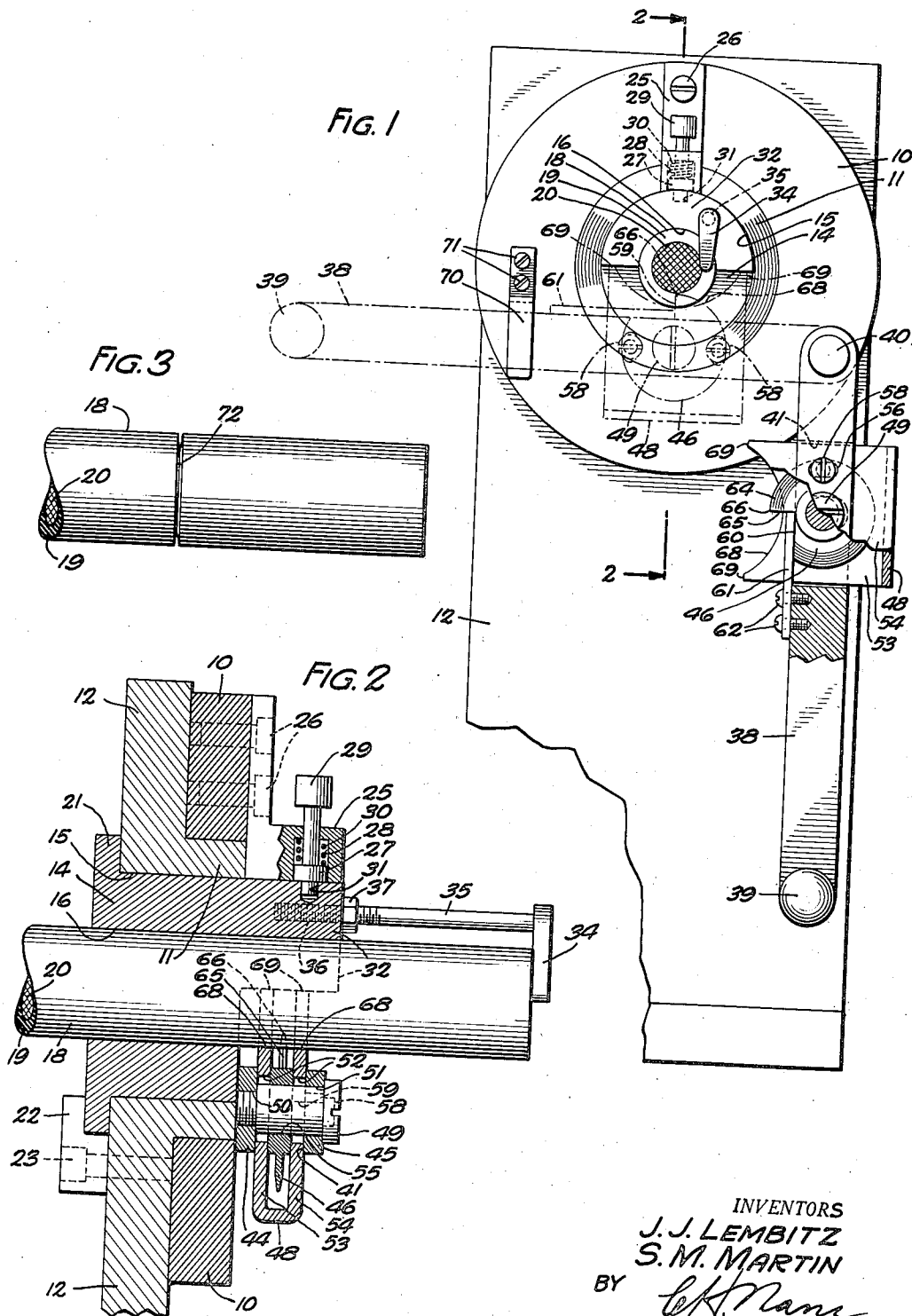


April 11, 1944.

J. J. LEMBITZ ET AL
INSULATION CUTTING APPARATUS
Filed March 27, 1943

2,346,314



INVENTORS
J. J. LEMBITZ
S. M. MARTIN
BY *Lehman*
ATTORNEY

UNITED STATES PATENT OFFICE

2,346,314

INSULATION CUTTING APPARATUS

Joseph J. Lembitz and Samuel M. Martin, Baltimore, Md., assignors to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application March 27, 1943, Serial No. 480,874

10 Claims. (Cl. 30—95)

This invention relates to insulation cutting apparatus and more particularly to an insulation cutting fixture designed to perform a transverse cutting operation upon rubber jacketed cables.

It is frequently desirable to strip from cable cores a part of the insulation adjacent to the ends of insulated cables in order to join the cable conductor to terminals or to splice lengths of the cables. In order that the stripped end of such a cable may fit accurately into a connector secured thereto, it is desirable to have the insulation severed in such manner that the resulting incision lies in one plane and a straight transverse shoulder is left at the end of the remaining insulation after the severed portion of the insulation has been removed. When the cables are insulated with vulcanized rubber compounds or other tough plastics, it is often difficult to sever the insulation on the ends of the cables so that the entire incision lies in one plane.

It is the object of this invention to provide new and improved insulation cutting apparatus.

One insulation cutting apparatus embodying the invention comprises a frame on which a rotatable disc is mounted to be rotated by a pivoted handle attached thereto, which carries a cutting blade secured in a slot thereof. A bushing having an opening of about the same size as the cable and having a gauge member to insure that a predetermined length of insulation is severed from the end of the cable, is secured to and rotated by the rotatable disc. By means of such apparatus, an annular incision may be made in the insulation at a predetermined distance from the end of the cable to facilitate stripping the insulation from the cable core.

Other objects and features of the invention will become apparent from the following detailed description of one embodiment of this invention, when read in conjunction with the accompanying drawing, in which

Fig. 1 is a fragmentary side elevation of a cable insulation cutting apparatus embodying the invention;

Fig. 2 is a fragmentary vertical sectional view thereof taken on line 2—2 of Fig. 1, and

Fig. 3 is a side view of a cable showing the annular incision produced in the insulation by the cutting apparatus.

Referring to Fig. 2 of the drawing, an annular disc 10 is rotatably mounted on a flange 11 of an upright 12 which may be attached to a work bench or other structure. A bushing 14 rotatably mounted in an aperture 15 in the upright 12 has a bore 16 therein whose diameter is substantially 55

the same as that of an insulated cable 18 comprising a core 20 surrounded by an insulating covering 19 made of a vulcanized rubber composition or the like, and from which a portion of the covering 19 is to be removed. For different sizes of cables, bushings having corresponding sizes of bores may be provided and each bushing fits into the aperture 15 so that the same apparatus may be used for cutting the insulation on cables of various sizes.

The bushing 14 is secured against longitudinal movement in the aperture 15 by a flange 21 formed on the bushing 14 and a lug 22 removably attached by a screw 23 to the upright 12. The annular disc 10 has an L-shaped member 25 attached thereto by screws 26—26. The L-shaped member has an aperture 28 therein in which a pin 29 is slidably mounted and in which a spring 30 bears against a collar 27 on the pin 29 and resiliently forces the pin into a socket 31 in a semicircular shoulder 32 of the bushing 14 to secure releasably the disc 10 and the bushing for rotation together.

A gauging arm 34 is transversely mounted on a rod 35 which is threaded into a threaded socket 36 in the shoulder. The distance of the gauging arm 34 from the shoulder 32 may be adjusted by screwing the rod 35 into the socket 36 the required distance, a nut 37 threaded on the rod 35 against the shoulder 32 serving to retain the rod in its adjusted position.

An arm 38 having a transverse handle 39 thereon is pivotally mounted on a pin 40 fixed in the disc 10. The arm 38 has a vertical slot 41 (Fig. 2) formed therein which is bounded by arms 44 and 45. A cutting disc 46 and a U-shaped gauge 48 partially surrounding the disc 46 are secured in the slot 41 by a screw 49. The screw 49 engages a threaded aperture 50 in the arm 44 and passes through an unthreaded aperture 51 in the arm 45, through a pair of elongated slots 52—52 in arms 53 and 54 of the U-shaped gauge 48, and through an aperture 55 in the disc 46. The arm 45 has a pair of slots 56—56 therein, of which only one is shown in full lines in Fig. 1, through which screws 58—58 pass. The screws 58—58 are screwed into threaded apertures 59—59 in the arm 54 to adjustably secure the gauge 48 against rotation relative to the arm 45. The cutting disc 46 has a heel 60 (Fig. 1) formed thereon upon which a rigid bar 61 bears to prevent rotation of disc 46 relative to the arm 38. The bar 61 is secured to the arm 38 by screws 62—62.

A circular cutting edge 64 and a radial cut-

ting edge 65 are formed on the disc 46 and form a sharp point 66 at the intersection thereof. The disc 46 may be removed from the slot 41 and the cutting edges 64 and 65 resharpened or a second heel 60 and a second cutting edge 65 ground thereon to form a second point 66 if desired.

The arms 53 and 54 of the U-shaped gauge 48 enclose the unused portion of the cutting disc 46 and have arcuate surfaces 68—68 on the ends thereof, which bear against the cable 18 when the arm 38 is in the position as shown in dotted lines in Fig. 1 and in full lines in Fig. 2. The arcuate surfaces 68—68 bearing on the insulation 19 prevent the point 66 from penetrating beyond the insulation into the cable core 20 and thereby prevent injury to the cable core during the insulation cutting operation. Flat end surfaces 69—69 of the arms 53 and 54 bear against the shoulder 32 when the arm 38 is in the position shown in dotted lines in Fig. 1 and prevent the adjacent arcuate surfaces 68—68 from flattening the insulation 19 during the cutting operation.

A catch 70 is secured to the disc 10 by screws 71—71 to receive the arm 38 when the arm is rotated into the position shown in dotted lines in Fig. 1.

In the operation of this device, with the arm 38 depending from the disc 10, substantially as shown in full lines in Fig. 1, an insulated cable 18 is inserted through the bore 16 in the bushing 14 until the end of the cable abuts the gauging arm 34 and is held manually in that position. The arm 38 is then rotated upon the pin 40 in a clockwise direction as seen in Fig. 1 to the position shown in dotted lines in that figure so that the point 66 on the cutting disc 46 penetrates the covering 19 to the depth permitted by the surfaces 68—68 and 69—69 on arms 53 and 54 of the gauge 48. The arm 38 then is in engagement with the catch 70 and further attempted rotation of the arm 38 causes the disc 10 and the bushing 14 secured thereto to rotate about the cable 18. Rotation of these members causes the cutting disc 46 to be forced through the insulation 19 in a circular path and the radial cutting edge 65 thereon makes a ring-like incision 72 (Fig. 3) in the covering 19. After the ring-like incision 72 has been formed, that portion of the covering 19 between the incision 72 and the end of the cable 18 can be stripped off.

As has been mentioned previously, the exposed length of the rod 35, which determines the amount of the insulation to be stripped from the cable, may be adjusted as desired. The bushing 14 may be removed from the frame 12 by turning the lug 22 and withdrawing the pin 29 from the socket 31 in the shoulder 32. If several bushings similar to the bushing 14 but having central openings of different sizes are provided, the fixture may be used to cut the insulation of cables of various sizes corresponding to the sizes of the bores in the bushings. Obviously, the gauge 48 can be loosened in the slot 41 and moved with respect to the arms 44 and 45 to leave a larger or smaller portion of the cutting disc 46 exposed for operation on cables having insulation of different thicknesses and to effectively prevent injury to the cable core 20 by the point 66 on the cutting disc 46.

The catch 70 holds the arm 38 against the disc 10 during the entire cutting operation and thus causes the arm and the cutting blade to be rotated in a plane perpendicular to the axis of the cable so that the incision 72 will be in said plane.

The embodiment disclosed hereinabove is illustrative of the invention and may be modified without departing from the spirit and scope of the invention, as pointed out in and limited only by the appended claims.

What is claimed is:

1. An insulation cutting apparatus comprising a frame, a member having an opening therein rotatably carried by the frame, and a cutter pivotally mounted with respect to the member and movable with the member to cut the insulation on a cable inserted in the opening in the member.

2. An insulation cutting apparatus comprising a frame, a member rotatably carried by the frame and having an opening therein, an arm pivotally attached to the rotatable member for movement with respect to the member and for rotating the member around a cable positioned in the opening in the member, a cutting blade secured to the arm to cut the insulation of the cable as the arm and the member are rotated around the cable, and a gauge adjustably secured to the arm, whereby a predetermined portion of the blade may be exposed to cut the insulation of the cable to a predetermined depth.

3. An insulation cutting apparatus comprising a frame having an opening therein through which an insulated cable may be inserted, a gauge adjustably secured with respect to the frame to permit insertion of only a predetermined length of a cable through the opening in the frame, a member rotatably carried by the frame, and cutting means pivotally attached to the rotatable member for movement with respect to the rotatable member and a cable inserted through the opening and for rotating the rotatable member around the cable with the cutting means to sever the insulation on the cable.

4. An insulation cutting apparatus comprising a frame having an opening therein through which an insulated cable may be inserted, a gauge secured adjustably with respect to the frame to permit the insertion of the cable only a predetermined amount through the opening in the frame, a member rotatably borne by the frame, an arm pivotally attached to the member for movement relatively to the member and a cable inserted through the opening in the frame and for rotating the member with respect to the frame and around the cable, a cutting blade secured to the arm to cut the insulation of the cable as the arm and the member are rotated around the cable, and a stop adjustably secured to the arm to bear against the cable during the cutting operation to permit the cutting blade to cut the insulation of the cable to a predetermined depth.

5. An insulation cutting apparatus comprising a frame, a bushing rotatably secured to the frame and having an opening therein through which a cable may be inserted, a member rotatably borne by the frame and locked to the bushing, an arm pivotally secured to the member to rotate it and the bushing locked thereto relatively to a cable inserted through the opening in the bushing, and a cutting blade secured to the arm for making a ring-like incision in the insulation of the cable as the blade is rotated relatively thereto.

6. An insulation cutting apparatus comprising a frame, a bushing rotatably secured to the frame and having a bore therein through which an insulated cable may be inserted; a gauge

secured to the bushing to permit a predetermined length of the cable to be inserted through the bore in the bushing, a member rotatably borne by the frame and secured to the bushing, an arm pivotally secured to the member for movement relative thereto and for rotating the member and the bushing secured thereto in unison relatively to the fixture and around a cable inserted through the bore in the bushing, and a cutting blade secured to the arm for cutting a ring-like incision in the insulation of the cable as the arm and the cutting blade are rotated around the cable.

7. An insulation cutting apparatus comprising a frame having a circular opening therein, a bushing which is rotatably secured in the circular opening and has a bore therein through which an insulated cable may be inserted and which is of substantially the same diameter as the cable whose insulation is to be cut, a gauge secured to the bushing to permit a predetermined length of the cable to be inserted through the opening therein, an annular disc rotatably borne by the frame and secured to the bushing, an arm pivotally secured to the annular disc for movement relative thereto and to rotate the disc and the bushing secured thereto in unison relative to the fixture and around a cable inserted through the bore in the bushing, and a cutting blade secured to the arm to cut a ring-like incision in the insulation of the cable as the arm and the blade are rotated relatively thereto.

8. An insulation cutting apparatus comprising a frame having an aperture therein, a member rotatably mounted on the frame, means pivotally mounted on the member for rotating the member around an insulated cable inserted through the aperture in the frame, and an insulation cutter secured to the pivoted means whereby the cutter may be moved to and away from and around a cable positioned in the aperture to cut the insulation on the cable.

9. An insulation cutting apparatus comprising an upright frame having a circular opening therein and a flange thereon concentric with the opening therein, a removable flanged bushing rotatably secured in the circular opening in the

frame, which bushing has a bore therethrough and a semicircular shoulder thereon, a gauge adjustably attached to the shoulder to permit only a predetermined length of an insulated cable to be inserted through the bore of the bushing, an annular disc rotatably mounted on the flange of the upright frame, means secured to the annular disc for releasably securing the disc to the bushing so that the bushing and the disc may rotate in unison with respect to the upright frame and around a cable inserted through the bore in the bushing, an arm having a slot therein pivotally secured to the disc, a disc-like blade removably secured in the slot in the arm having a V-shaped cut out portion in the periphery thereof and a cutting edge formed thereon, and a U-shaped stop adjustably secured in the slot in the arm to expose only a predetermined portion of the disc-like blade.

10. An insulation cutting apparatus comprising an upright frame having a circular opening therein and a flange thereon concentric with the opening therein, a removable bushing rotatably secured in the opening, which bushing has a bore therethrough of substantially the same diameter as an insulated cable to be operated upon and a threaded aperture therein, a gauge adjustably threaded into the aperture in the bushing to permit only a predetermined length of the cable to be inserted through the bore in the bushing, an annular disc rotatably mounted on the flange of the upright frame, means to releasably secure the bushing to the annular disc for movement in unison therewith, an arm pivotally mounted on the annular disc and having a handle thereon and a slot therein, the arm being movable with respect to the disc and to a cable inserted through the bore in the bushing and designed to rotate the annular member and the bushing around the cable, a disc-like blade having a plurality of cutting edges thereon secured in the slot in the arm, and a U-shaped stop adjustably secured in the slot in the arm to expose only a variable predetermined portion of the disc-like blade.

JOSEPH J. LEMBITZ.
SAMUEL M. MARTIN.