July 27, 1965 E. I. TERNOVITS ETAL 3,196,780

WIRE MARKING DEVICE

Filed Nov. 6, 1963 2 Sheets-Sheet 1

FIG. 1

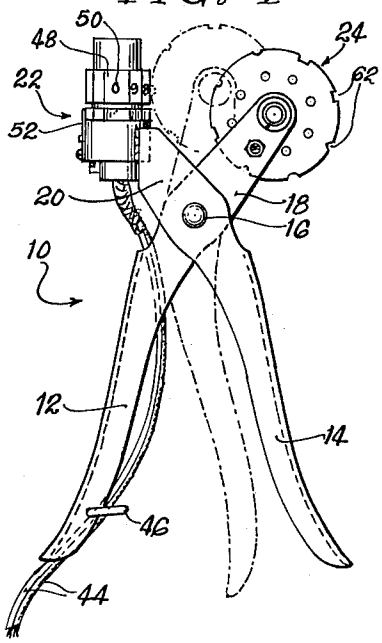


FIG. 2

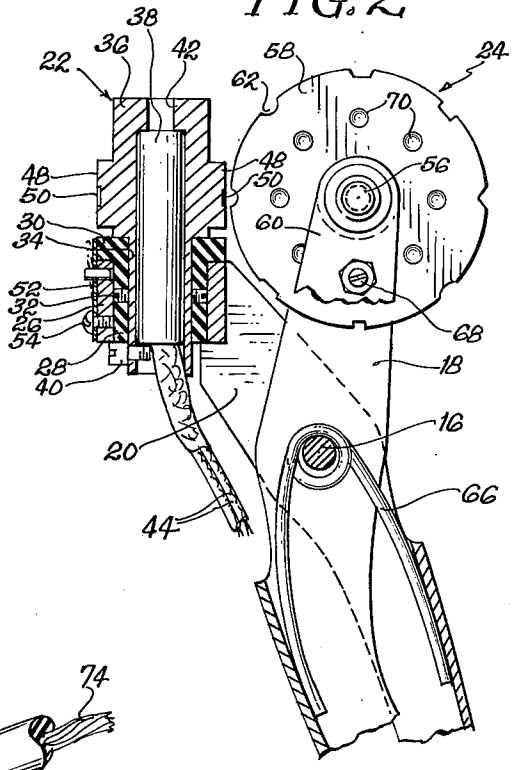


FIG. 4

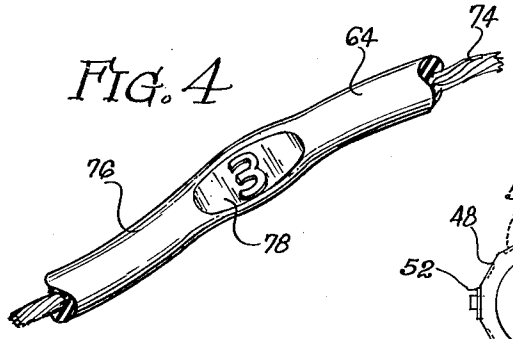


FIG. 3

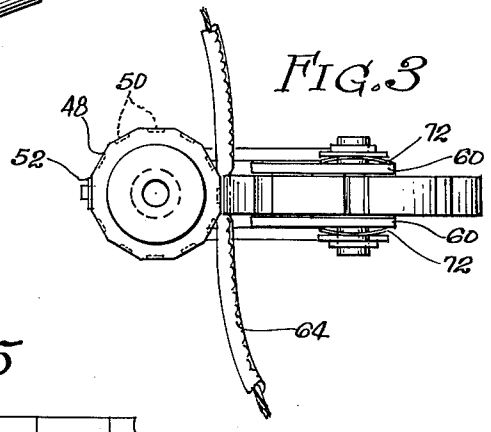
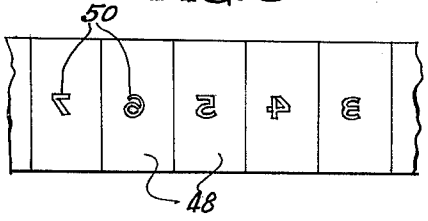


FIG. 5



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FIG. 6

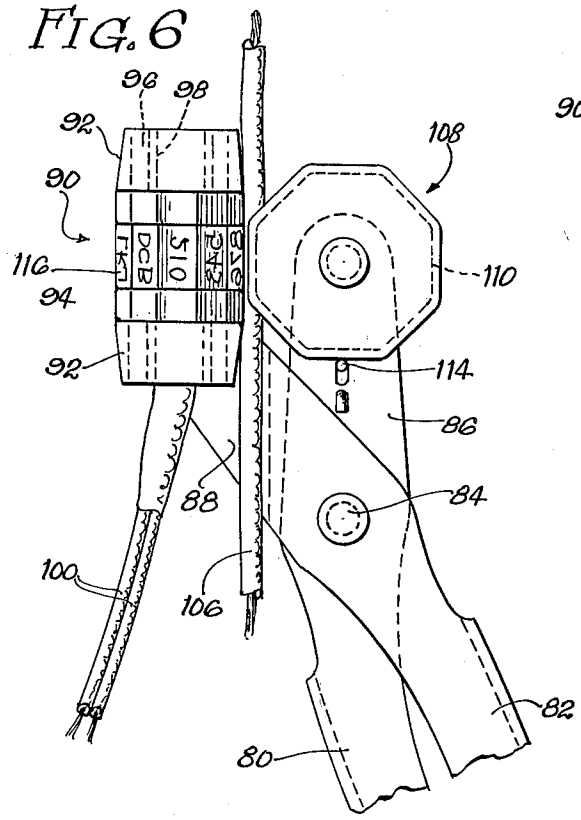
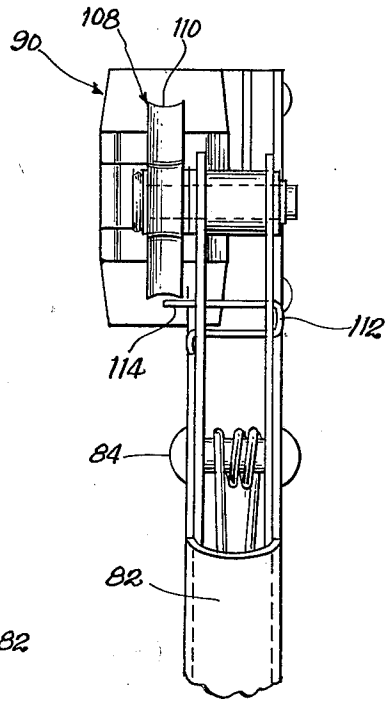


FIG. 7



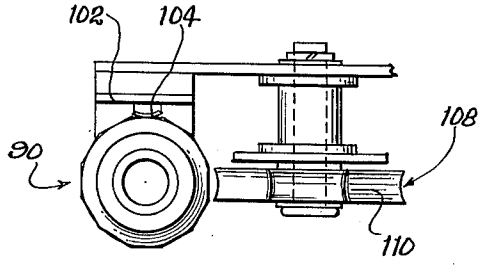


FIG. 8

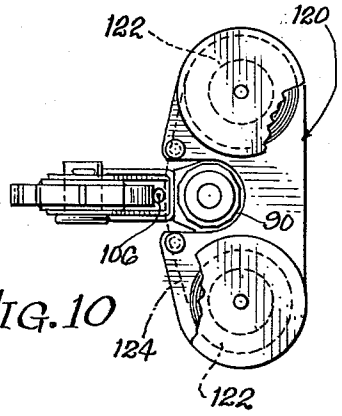


FIG. 10

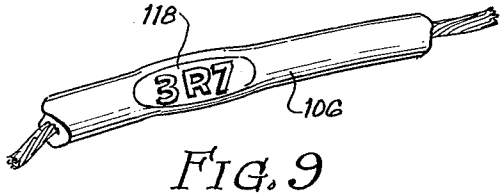


FIG. 9

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WIRE MARKING DEVICE

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3 Claims. (Cl. 101—10)

This invention relates to a device for marking wire. In particular, the invention is concerned with the marking of electrical wire although it will be appreciated that the structure to be described can be employed for the marking of other wire materials.

It is well known in the electrical industry that many constructions require the provision of large numbers of wires. Such wires are utilized for joining various electrical components and for purposes of compactness and efficiency. It has been found desirable to run the wires together in an installation. In many instances, dozens of wires are attached together in an installation even though the wires are connected to a wide variety of different components.

The problem of identifying different wires in an installation has been a long standing one. In many instances, the improper operation of an installation can be attributed to a particular component and, therefore, it is highly desirable to provide identification of electrical wires so that all leads to a particular component can be checked. The desirability of identifying wires is particularly apparent where groups of wires are combined together in a construction. However, identifying means for electrical wires are desirable even where large numbers of wires are not involved.

The prior art has usually resorted to the provision of different colors for wires so that the differences between various wires will be apparent to the naked eye. Since electrical wires must be insulated from each other, particularly where large groups are held together in an installation, the art has resorted to the use of insulating coverings of different colors and patterns. This technique of the art has not been entirely satisfactory, however, since there are a limited number of readily distinguishable colors and combinations available. Furthermore, differences in colors do not by themselves provide any information with regard to the particular component with which a wire may be associated. Thus, one interested in studying an installation may be able to determine that given wires in the installation are connected to different components; however, the color alone will usually not give any information as to the particular application with which a wire is involved. Accordingly, it is highly desirable to provide means for not only distinguishing wires from each other but also for providing other identifying material whereby information regarding the use of the wire will be available.

It is an object of the instant invention to provide a unique device for applying identifying symbols to wires and similar constructions.

It is a more particular object of this invention to provide a device which can be employed for marking wires with an identifying symbol in a simple and efficient manner whereby the material on the wire can be used alone or in combination with colors and patterns to simplify differentiation between wires.

It is a further object of this invention to provide a wire marking device which is capable of applying sharp and clear identifying characteristics on a wide variety of wire constructions including constructions employing plastic, fiber and other insulating coverings.

These and other objects of this invention will appear hereinafter and for purposes of illustration but not of

limitation, specific embodiments of this invention are shown in the accompanying drawings in which:

FIGURE 1 is a plan view of a wire marking device characterized by the features of this invention;

FIGURE 2 is an enlarged fragmentary view partly in section illustrating the marking heat portions of the device of FIGURE 1;

FIGURE 3 is a top view of the device of FIGURE 1;

FIGURE 4 is a fragmentary view illustrating a symbol applied to a wire construction in accordance with this invention;

FIGURE 5 is a fragmentary view illustrating the impression head employed in the marking device;

FIGURE 6 is an enlarged fragmentary plan view of an alternative form of the invention;

FIGURE 7 is a side elevational view of the structure shown in FIGURE 6;

FIGURE 8 is a top view of the structure shown in FIGURE 6;

FIGURE 9 is a detail fragmentary view of a wire section marked with the device of FIGURES 6 through 8; and,

FIGURE 10 is a plan view of the wire marking device wherein a marking tape assembly is employed in combination therewith.

The device of this invention generally comprises a tool including a pair of relatively movable heads. A marking means for the wire is located on one of the heads and identifying symbols are defined by this marking means. Heating means are also associated with the device whereby the symbols on the marking means are adapted to be heated. The device also includes a second head which defines means for holding a wire to be marked with the identifying symbols. When the heated symbols are brought into contact with the surface of the wire by moving the heads together, the symbol will be inscribed in the wire surface.

The tool of this invention is characterized by great versatility since the marking head can be movable and a plurality of different symbols can be defined thereby. Similarly, the wire holding head can be movable and can define a plurality of holding areas of different size and shape whereby a variety of corresponding wires can be accommodated. With this arrangement, the movable marking head can be positioned to provide for the inscribing of a particular symbol. Similarly, the holding head can be moved to a desired position depending on the nature of the wire to be marked. Each of the heads preferably includes index holding means so that the heads will tend to automatically be aligned for a particular marking operation.

The device of this invention is particularly designed for the marking of insulated wire although bare wire could also be supplied with identifying symbols through the use of this device. In the case of insulated wire, the heating means should be controlled in accordance with the type of insulation. In the case of plastic wire, the symbols should be heated so that the wire will soften when engaged by the marking means but will not melt or be displaced so as to affect the insulating character. In the case of insulation which is manufactured from cloth or other fiber material, the heating of the identifying symbols should be such that the fabric will be scorched whereby the symbols will be "burned into" the insulation. Again, the heat must be controlled so as to avoid destruction of the fiber whereby the reliability of the insulation would be impaired.

FIGURE 1 of the accompanying drawings illustrates a tool 10 which comprises a wire marking device suitable for use in accordance with this invention. The device comprises arms 12 and 14 which are pivotally connected at 16. The arms include extending portions 18 and 20,

respectively, and these extending portions are employed for carrying a wire marking head generally designated by the numeral 22, and a wire holding head generally designated by the numeral 24.

As best shown in FIGURE 2, the marking head 22 is attached to the portion 20 of this device by means of a sleeve 26, this sleeve being preferably welded or otherwise fixed to the portion 20. A cylindrical member 28 having annular shoulder 30 is rotatably received within the sleeve 26. The cylindrical member 28 is preferably formed of a heat insulating material.

Tied to the cylindrical member 28 by means of set screws 32 is the shank 34 of the main body portion 36 of the marking head. This main body portion is hollow whereby a resistance heater 38 can be received therein. Blocking screw 40 serves to hold the heater within the body portion 36 while an opening 42 at the top of this body portion facilitates removal of the heater when the screw 40 is disengaged. The leads 44 for the heater preferably extend along the handle portion 12 to a heat control (not shown). A link 46 is provided to keep the lead wires 44 from becoming tangled in the other elements of the device.

The head 22 defines a plurality of faces 48, each of which carries a symbol 50. In the embodiment illustrated, the symbols are recessed in the faces 48, however, it will be apparent that raised symbols could also be employed for achieving the results of this invention. In order to properly dispose the faces 48 for a marking operation, an indexing leaf 52 is attached to the sleeve 26 by means of the screw 54. The upper end of this leaf is adapted to engage the flat sides of the shoulder portion 30 of the cylindrical member 28. These flat sides correspond to the flat faces 48 of the head 22 and, accordingly, the indexing leaf will tend to situate the marking head in a plurality of different positions depending on the number of symbols defined by the head. The association of the indexing leaf with respect to the faces 48 is best shown in FIGURE 3.

The wire holding head 24 is rotatably mounted at 56 on the extending portion 18. This head comprises a disc 58 which fits between the bifurcated arms 60 defined by the portion 18.

The wire holding head defines a plurality of grooves 62 which are of different size and shape so that the head can accommodate wires having corresponding characteristics. As best shown in FIGURE 3, a wire 64 is adapted to be brought into alignment with a groove 62 and the marking head is then brought into contact with the wire by operating the arms 12 and 14 against the action of the spring 66. In order to assure proper alignment of the wire holding groove with respect to the marking head, a ball tip set screw 68 is preferably associated with the portion 18 whereby the set screw will be adapted to fit into the hemispherical recesses 70. Spring means 72 are associated with the bifurcated arms 60 so that the detent 68 will tend to settle in one of the recesses 70 when the head 24 is rotated. It will be apparent, therefore, that with this arrangement, the wire holding openings 62 can each be properly aligned with respect to the marking head with a minimum of difficulty.

FIGURE 4 illustrates a section of wire 64 comprising an internal conductive portion 74 and exterior insulation 76. The marking 78 illustrated thereon can be achieved through the operation of the device described above. If the insulation 76 is of plastic material, then the heat of the resistance heater 38 is controlled whereby the plastic will not melt and whereby a sharply outlined figure will be provided. In the illustration of FIGURE 4, a single symbol is disposed on the wire. It will be understood, however, that a series of the same or different symbols could be provided adjacent each other on the wire by means of the device described. In such case, a combination of numbers will greatly multiply the number of identifying possibilities.

The modification illustrated in FIGURE 6 through 9 can also be employed for the application of a single symbol although this device is primarily designed for the application of a series of symbols in a single operation. The tool illustrated comprises arms 80 and 82 which are pivoted at 84 and which extend to head holding portions 86 and 88, respectively. The head 90 fixed to the arm portion 88 includes a fixed section 92 and a rotatable marking section 94. This rotatable section may include an insulating portion 96 and a hollow interior portion 98. A heating element having leads 100 is included in the same manner as described above.

A resilient arm 102 attached to the portion 88 includes a detent 104 which is adapted to engage the respective faces on the head 90 whereby the symbols on these faces can be presented in a proper position for marking of a wire 106.

The wire holding head 108 includes grooves 110 which are disposed on the periphery of this head in lines perpendicular to the axis of the head. A resilient U-shaped wire 112 is fixed to the portion 86, and the end 114 of this wire tends to seat on the flat edge of the head 108. Again, this arrangement will provide for automatic alignment of the head for placement of the wire and eventual marking.

The grooves 110 are elongated and the marking head 90 includes a row of symbols 116 whereby a plurality of the symbols can be disposed on the wire 106 as illustrated at 118 in FIGURE 9. It will be apparent that this arrangement has distinct advantages since codes can be worked out and applied to each head whereby a single marking operation will serve to completely identify a given wire.

The construction shown in FIGURE 10 comprises a modification wherein an assembly 120 is attached to the arm 88 supporting the head 90. The assembly includes reels 122 which support tape 124. The reels are located whereby the tape will be disposed between the wire to be marked and the head 90 when the head is pressed against the wire.

With this arrangement, the symbols formed in the wire will be more readily visible since a background can be provided by the tape 124. Specifically, a plastic tape can be utilized whereby material on the tape will be displaced onto the wire when subjected to the pressure of the head. Conventional typewriter ribbon can also be employed since any marking tape will provide a change in the background in the area of the symbols whereby the location of the symbols and the reading thereof will be facilitated.

In the embodiment illustrated, the reels 122 can be manually turned when fresh tape is desired. It will be understood, however, that conventional means for indexing the tape after each use could readily be employed.

It will be apparent that there has been described a wire marking device which is characterized by many advantages. The device permits the marking of a wire in one simple operation, and it will be obvious that the marks provided are more suitable for distinguishing wires than techniques employed in the prior art. Moreover, the particular mechanism employed, including the use of heated marking areas, provides sharp and distinct identifying symbols. It will also be appreciated that a great deal of versatility is embodied in the marking tool since it is capable of operating on a wide variety of materials including plastics and fiber materials.

It will be understood that various changes and modifications can be made in the above described construction which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

1. A wire marking device comprising a pair of pivotally connected arms, head holding portions integral with said arms and extending beyond the pivotal connection whereby pivoting of said arms will result in movement of said head holding portions toward and away from each other,

heads rotatably mounted on each of said holding portions, a marking means associated with one head, a plurality of identifying symbols defined by said marking means whereby rotation of said one head provides for selective indexing of said symbols to a marking position, heating means associated with said device and adapted to heat said symbols, a plurality of wire holding positions comprising grooves of different sizes and configurations associated with said other head to accommodate wires of different size and shape, rotation of said other head providing for selective indexing of said wire holding means whereby a wire can be located in said holding means and said heated symbols can be brought into contact with the surface of said wire for marking thereof, and means carried by each of said head holding portions for releasably engaging said heads and for holding each of said heads in position against displacement during a marking operation, the means releasably engaging said heads being located whereby they engage the heads at points remote from the portion of the heads acting on a wire to be marked.

2. A device in accordance with claim 1 wherein said heads rotate on axes perpendicular to each other and wherein said grooves extend perpendicular to the axis of said one head whereby the wire to be marked is inserted in one of said grooves in a position generally perpendicular to the axis of said one head, and wherein the means releasably engaging said one head comprises a resilient strip attached to a side wall of the holding means for said one head, and including a member mounted coaxially with said one head defining a plurality of flat faces engageable with said resilient strip, said flat faces rotating with said head and corresponding in number to the symbols defined by said one head, and wherein said other head defines a

plurality of recesses located in positions corresponding to said grooves, said holding means for the other head defining a ball adapted to seat in one of said recesses to releasably maintain one of said grooves in proper position for receiving a wire.

3. A device in accordance with claim 1 wherein said heads rotate on axes perpendicular to each other and wherein said grooves extend perpendicular to the axis of said other head and along the periphery of said other head whereby the wire to be marked is positioned generally parallel to the axis of said one head when located in one of said grooves, and wherein said one head defines a plurality of flat faces with each face defining one of said symbols, the holding means for said one head carrying a resilient strip adapted to engage an extension of said flat faces for releasably holding one of said faces in a marking position, said other head defining flat edges along opposite sides of each groove, and a resilient wire carried by the holding means for said other head adapted to engage said flat edges for releasably holding one groove in marking position.

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