Oct. 25, 1932. T. E. JERABEK 1,884,713

METHOD OF AND APPARATUS FOR COATING WIRE

Filed April 25, 1930

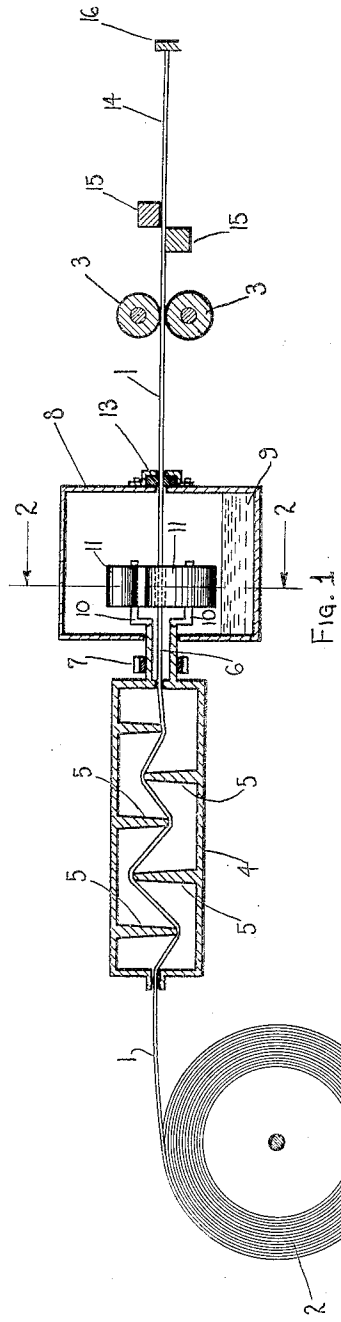


FIG. 1.

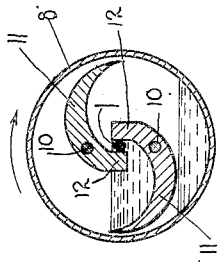


FIG. 2.

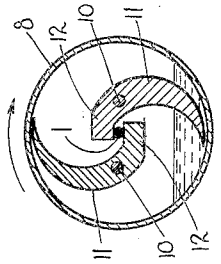


FIG. 3.

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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR COATING WIRE

Application filed April 25, 1930. Serial No. 447,279.

This invention relating, as indicated, to a method of and apparatus for coating wire, has specific reference to such method and apparatus particularly applicable to coating electrodes commonly employed in electric arc welding.

The method now commonly employed in coating wire in the manufacture of coated electrodes usually consists in cutting such wire into elements of the proper length and then dipping or spraying such wire with a suitable flux. A particular disadvantage in this method of coating the electrode resides in the fact that the wire which has been drawn through a common form of dies in the course of its manufacture, has adhering thereto residual quantities of the lubricant employed in the wire-drawing operation. This lubricant, which may be lime, oil, or any of the common forms of lubricant usually employed, not only is present as a superficial coating on the wire, but also has penetrated to the minute pores on the outer surface of the wire.

By dipping or spraying the flux onto the surface of the electrode, the flux is formed as a coating lying outside of the coating by the residual drawing lubricant, and consequently the coating on the electrode is uneven in consistency, and in a great many cases, of inferior quality. By the method and apparatus comprising my invention, I propose to thoroughly mix the flux with the residual coating of drawing lubricant and, in this manner provide a flux coating for electrodes superior in quality to any heretofore employed. This impregnation of the flux into the residual coating of drawing lubricant produces a satisfactory resultant coating, inasmuch as the ingredients used as a drawing lubricant are not harmful to the action of the flux in the welding arc. It is among the objects of my invention to provide a method and apparatus having the above named desirable characteristics. Other objects of my invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims. The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a sectional view showing the apparatus comprising my invention and by which the method of my invention may be carried out; Figs. 2 and 3 are transverse sectional views of the mechanism illustrated in Fig. 1, taken on a plane substantially indicated by the line 2—2, and showing different positions of the coating arms.

Referring more specifically to the drawing and more especially to Fig. 1, the wire 1 which is to be coated and later employed as a welding electrode, is shown wound on a spool 2 which is the usual form in which such wire is received from the drawing mills. The wire 1 is drawn off from the spool 2 by means of draft wheels 3 which cause such wire to be moved through the straightening and coating mechanism now to be described.

In order to straighten the wire 1 as it leaves the spool 2, and to correct any tendencies thereof to curl after the coating process has been completed, I employ a revoluble straightening means 4 which has baffle elements 5 therein adapted to rebend the wire beyond its elastic limit in several different directions as the member 4 rotates, so that, when the wire as at 6 leaves the straightening element, it will be in the form of a straight rod. The straightening element 4 may be driven by means of pinion 7 being in mesh with a suitable form of driving gear (not shown).

Positioned adjacent the straightening member 4 is a flux bath container 8 which contains the flux 9 which is to be supplied as a coating to the wire 1. Projecting axially from the straightening member 4 are a pair of arms 10 which lie parallel to and at equal distances on opposite sides of the axis of the portion of the wire 6 as it leaves the straightening element and passes into the flux bath. Oscillably mounted on the arms 10 are arcuate elements 11, which, at their

terminal portions 12, are adapted to frictionally engage the wire as such wire passes through the bath.

The rotation of the straightening member 4 causes a similar rotation of the arms 10 and likewise a rotation in the container 8 of the arcuate members 11. With the arcuate members 11 rotated in the direction indicated by the arrows associated with Figs. 2 and 3, such arcuate elements dip into the flux 9 and cause such flux to be thrown over the wire 1 as it passes through the bath. The resistance to rotation of the members 11 offered by the air and the flux, causes the terminal portions 12 thereof to frictionally engage the wire as it passes through the bath. The frictional engagement of the wire on the part of the terminal portions 12, causes the flux which has been sprayed onto the wire to be smeared and rubbed into the residual coating of drawing lubricant on the wire. This vigorous rubbing and smearing action on the part of the portions 12, causes the flux to be thoroughly impregnated in the residual coating on the wire and causes a resulting coating of even consistency.

The coating as applied to the wire by means of the arcuate elements 11 and their associated terminal portions 12 may be uneven in cross-section, so that a wiping element 13 may be employed through which the wire 1 passes as it leaves the bath, which wiping element removes any excess flux and distributes the coating evenly over the surface of the electrode. The heat generated in the wire in passing through the straightening element 4 will cause the flux coating thereon to be dried soon after the wire leaves the wiping element 13. If the heat generated by the straightening element 4 is insufficient for this purpose, the wire 1 may be heated by any other means before being introduced either to the straightening element or to the bath.

After the wire leaves the draft wheels 3, it may be sheared into suitable lengths as 14 by means of shear elements 15, the length of the elements 14 being determined by the relative position of a stop 16 with respect to the shearing plane of the elements 15. The wire, after leaving the draft wheels 3, instead of being sheared into suitable lengths as above indicated, may be wound on a reel (not shown) and further disposed of in accordance with any one of several different methods.

From the above description it will be noted that the flux which is placed on the wire from which the electrodes are cut, is thoroughly smeared and worked into the residual coating of drawing lubricant on the wire, so that a resultant coating is produced being homogeneous in structure and which does not have as a part thereof separate coatings of flux and residual drawing lubricant.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. The method of coating welding electrode which comprises applying a coating of flux to such electrode, working such flux into the residual drawing lubricant present on the electrode, and then distributing an even layer of the resultant flux over the surface of the work electrode.

2. The method of coating welding electrode which comprises impregnating the residual drawing lubricant present on the electrode with a suitable flux and then evenly distributing the resultant material as a coating over the surface of the electrode.

3. The method of coating welding electrode which comprises impregnating the residual drawing lubricant present on the electrode with flux, applying an excessive coating of such flux to such electrode, and then wiping off the excess to distribute a coating over the surface of the electrode.

4. The method of coating welding electrode which comprises painting such electrode with a coating of flux, mixing such coating with the residual drawing lubricant present on the electrode, and then evenly distributing the resultant coating over the surface of the electrode.

5. The method of coating welding electrode which comprises heating such electrode, applying a coating of flux thereto, mixing such flux with the residual drawing lubricant present on the electrode and then evenly distributing the resultant coating over the surface of the electrode.

6. The method of coating welding electrode which comprises re-bending such electrode to straighten and heat the same, and while said electrode is still heated, applying thereto a coating of fluxing material.

7. The method of coating welding electrode which comprises re-bending such electrode to straighten the same, while said electrode is so heated, applying a coating of fluxing material to such electrode in excess of the desired quantity, and then removing the excess quantity of such material.

8. The method of coating welding electrode which comprises re-bending such electrode to straighten the same, and immediately after such straightening operation, and while such electrode is still in a heated state as a result of such operation, applying a coating of fluxing material to the electrode.

9. In apparatus for coating wire, the combination of rotatable straightening means, a flux bath chamber adjacent said straighten-

ing means, spaced shafts carried by said straightening means and extending into said chamber, and arms pivotally supported intermediately of their ends on said shafts, said arms at one end adapted to engage said wire and at their other ends dip into said flux bath.

Signed by me this 23rd day of April, 1930.

THEOPHIL E. JERABEK.