June 21, 1932. B. TURNER 1,863,772

COATED ELECTRODE FOR ELECTRIC ARC WELDING

Filed Oct. 28, 1931

Fig. 1.

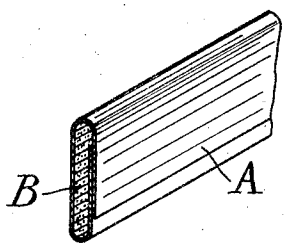


Fig. 2.

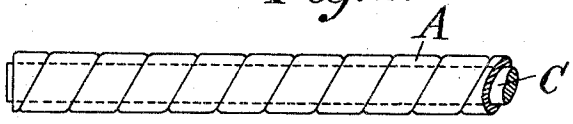
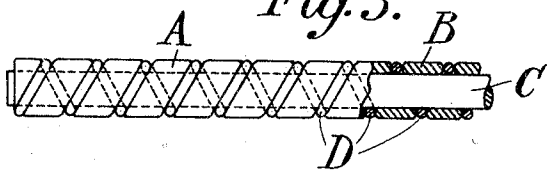


Fig. 3.



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UNITED STATES PATENT OFFICE

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COATED ELECTRODE FOR ELECTRIC ARC WELDING

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Electrodes for metallic arc welding in which the coating consists of asbestos yarn wound closely round a metal core are well known. A variation, in which the asbestos yarn is wound in an open spiral leaving spaces between the turns which are subsequently filled with powdered materials held together by a binding agent is also well known. These, and similar types of electrodes, although successful in use, are expensive to manufacture, and in consequence many electrodes have been produced in which the coating consists of the desired constituents wholly in powdered form, being mixed with a suitable binding agent and applied by dipping the rod while the mixture is fluid. Such dipped electrodes are cheaper to produce than those with a winding of asbestos yarn. To obtain the best results, however, it is necessary that the coating should be, relatively, of considerable thickness, and it is difficult in practice to obtain by dipping a coating which is at once sufficiently thick and at the same time completely free from eccentricity. For smooth and uniform work in the welding operation, the chemical composition of the coating must be correct, but it is equally important that the coating should lie evenly or concentrically round the metal core, and should be of the same thickness in all parts along the length of the electrode. Electrodes coated with paste or powder are seldom completely free from eccentricity, that is to say, the coating on one side is frequently thicker than on the other side of the electrode, resulting in less satisfactory work.

It is also well known that the addition of other metals and alloys in powdered form to the coating frequently improves the quality of the deposited metal, and enables alloys to be synthesized in the weld. It is difficult to obtain entirely consistent and reliable results when the appropriate metal, alloy or other powders are incorporated in the coating of electrodes by dipping.

The object of the present invention is to provide an improved means of applying the substance to be used for coating the electrode, in the form of paste, powder or fibre to the metal core of the electrode.

The accompanying drawing shows, by way of example, two methods of carrying out the invention.

Figure 1 is a perspective view of a portion of a length of tube, consisting of a thin covering of material encasing a coating substance, the tube having been flattened out to the desired extent by rollers;

Figure 2 shows the tube wound in a closed spiral on a metal core forming the electrode, while

Figure 3 shows a modified form of the invention in which the tube is wound on a metal core in conjunction with an open spiral winding of asbestos yarn.

According to this invention I first encase the coating substance in a thin covering material of sufficient strength and elasticity for the purpose, in much the same way as tobacco is encased in paper to form a cigarette. The encasing material may consist, for example, of suitable varieties of paper, or vegetable or animal membranes or the like, but the material which I have found to be the most satisfactory is that sold under the registered trade mark as "Cellophane", which is a product similar to artificial silk in composition, being a derivative of cellulose. This material can be obtained in very thin sheets of considerable strength and elasticity. The tube of coating substance thus formed may be of any desired length and of any desired cross section. It may, for instance, be circular, or approximately rectangular in section or flattened out in the form of a tape. It is a relatively simple operation to produce a uniformly filled tube, and the coating substance within the tube may be of any desired composition, as for example, a mixture of asbestos powder or fibre and fluxing substances, mixed, if desired, with powdered metallic elements or alloys. The tube or tape is applied evenly to the metal core in any suitable manner, as, for instance, by spiral winding. In this manner an electrode is produced which has a substantially equal thickness of coating all the way round and throughout the length of the rod.

If desired, this invention can be applied to the manufacture of that type of electrode with an open spiral winding of asbestos yarn or the like. In this case, the metal rod receives the open winding of yarn and the coating of the rod is completed by winding a tube as described of the correct rectangular section in the space not occupied by the yarn.

Another arrangement is to apply the tube longitudinally to the metal core of the electrode in one or more strips which are pressed on to the said core so as to give a complete and even coating.

The encasing material, while giving mechanical support to the coating substance contained therein, need not be present in sufficient quantity materially to affect the welding process and in the case of Cellophane may be of advantage because of the reducing gases formed thereby.

Figure 1 shows a portion of a length of tube consisting of a thin covering material A, such as "Cellophane", encasing some coating substance B which may be in the form of paste, powder or fibre and of any desired composition. This tube may be made circular in the first instance in the same manner as a cigarette tube is made, and then flattened out to the desired extent by rollers.

Figure 2 shows the tube wound in closed spirals around a metal core C forming an electrode having the advantages hereinbefore described.

Figure 3 shows an alternative arrangement in which the tube is wound in conjunction with an open spiral winding D of asbestos yarn on the metal core.

What I claim is:—

1. A coated welding electrode in which the coating substance is completely encased in a tube of non-metallic material, the said tube being applied to the metal core of the electrode.

2. A coating welding electrode according to claim 1, in which the tube is wound spirally around the metal core of the electrode.

3. A coated welding electrode according to claim 1 in which the tube is made of a cellulose derivative.

4. A coated welding electrode in which the coating substance is completely encased in a tube of thin covering material, said tube being wound spirally around the metal core of the electrode, the thin covering material of the tube consisting of material made of a cellulose derivative.

5. A coated welding electrode in which the coating substance is encased in a tube of non-metallic material, said tube being wound spirally around the metal core of the electrode, said metal core being wound with an open spiral winding of asbestos yarn, the space between the turns of the yarn being covered with a winding of the said tube.

6. A coated welding electrode in which the coating substance is completely encased in a tube of thin covering material made of a cellulose derivative, the metal core of said electrode being wound with an open spiral winding of asbestos yarn, the space between the turns of the yarn being covered with a winding of said tube.

In testimony whereof I have signed my name to this specification, at Wolverhampton, this fourteenth day of October, 1931.

BERTRAND TURNER.