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H. R. GRAHAM

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APPARATUS FOR APPLYING LIQUID TREATING MEDIUM TO TENUOUS ARTICLES

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FIG. 1.

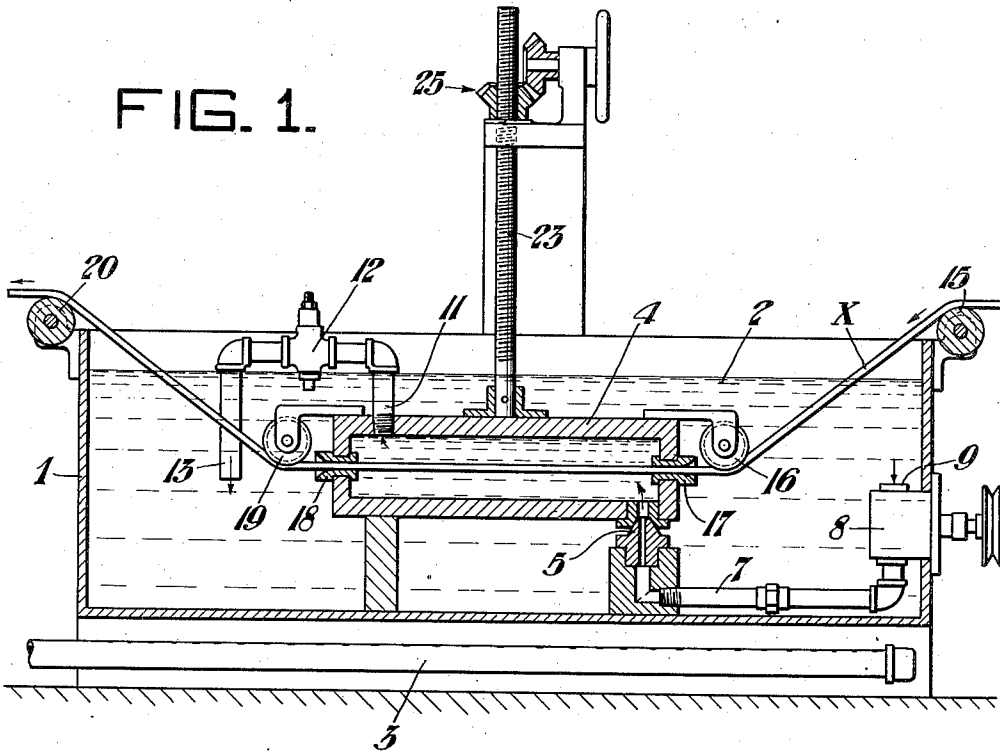
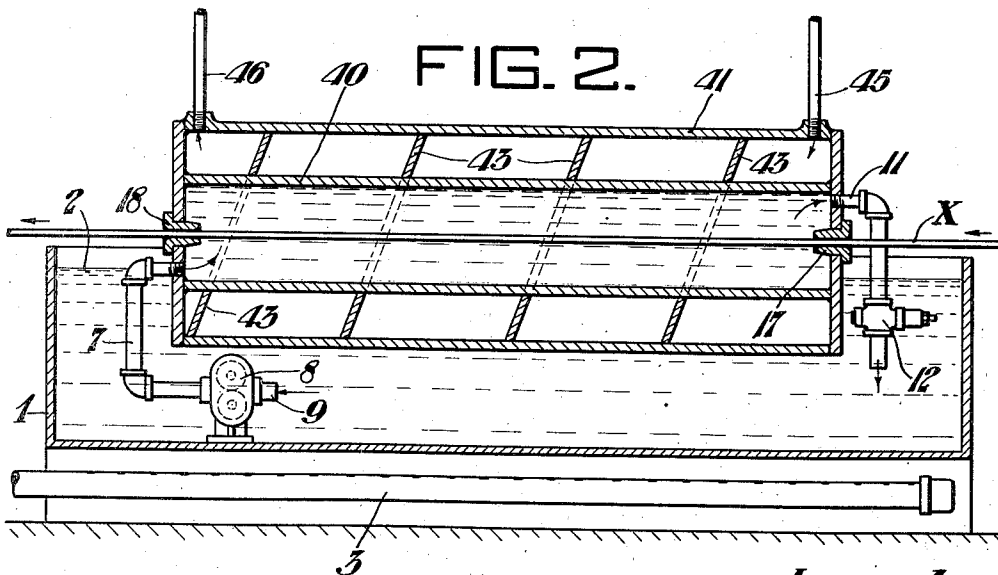


FIG. 2.



Inventor:
HUGH R. GRAHAM,
by: John E. Jackson
his Attorney.

UNITED STATES PATENT OFFICE

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APPARATUS FOR APPLYING LIQUID TREATING MEDIUM TO TENUOUS ARTICLES

Hugh R. Graham, Worcester, Mass., assignor to
The American Steel and Wire Company of New
Jersey

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4 Claims. (Cl. 91—32)

This invention relates to the application of a liquid treating medium to tenuous articles, and more particularly to fibers and fibrous materials such as the coverings on electrical conductors, although not limited thereto.

In the past, fibers and fibrous materials of the type used to cover electrical conductors have been treated by passing them around a drum or plurality of drums which are immersed in a bath of saturant or coating medium. Frequently the saturant or coating medium is in a heated condition. The number of turns around the drums of the article to be treated, the size of the drums, and the speed at which the article is drawn through the bath, determine the actual length of time necessary for the treatment.

The foregoing and similar prior art methods require relatively large tanks to hold the liquid treating medium and the drums around which the article is passed; and in the case of those treating media requiring hot applications, a considerable amount of fuel is necessary to heat the bath and maintain it in heated condition.

It is among the objects of the present invention to provide an apparatus for applying a liquid treating medium to a tenuous article which attains the desired ends in a minimum of time.

Another object is to provide an apparatus of the class described which is compact and easy and inexpensive to manufacture, operate and maintain.

The invention, then, comprises the features hereinafter fully described and as particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail certain illustrative embodiments of the invention, these being indicative of several of the number of ways in which the principles of the invention may be employed.

In said drawing:

Figure 1 is an elevational view, partly in section, of an apparatus made in accordance with the teachings of the present invention.

Figure 2 is a view similar to Figure 1 but disclosing a permissive modification.

Referring more particularly to the drawing, the numeral 1 designates a tank which is adapted to hold the liquid treating medium 2 (such as a saturant, coating material, etc.). This tank 1 is heated in any suitable manner, such as by a fuel burner 3.

Within the tank 1 there is disposed a suitably supported vessel or treating chamber 4. According to one embodiment this vessel or treating chamber 4 is totally immersed in the liquid treat-

ing medium (see Figure 1). The liquid treating medium is forced into the vessel or treating chamber 4 adjacent one of its ends through a nozzle 5 upon which it rests. This nozzle 5 is connected to a supply pipe 7 which receives the liquid from a pump 8 having an inlet 9 through which the liquid is obtained.

Adjacent its other end, the vessel or treating chamber 4 is provided with an outlet pipe 11 having connected therein a relief valve 12 which is preferably adjustable. This outlet pipe 11 is provided with a return pipe 13 which extends below the surface of the liquid.

The article to be treated, designated herein after at X, is fed into the tank 1 over an inlet roller 15 and directed to a roller 16 which imparts horizontal movement to the article, whereby it may be introduced in a horizontal direction to a die 17 having a horizontally extending bore. As the article to be treated travels the length of the vessel or treating chamber 4, it assumes a straight and horizontal path and emerges in a horizontal direction through a die 18 having a horizontally extending bore. From the die 18 the article is directed under a pulley 19 which corresponds to the roller 16 mentioned hereinbefore, and is deflected upwardly out of the tank 1 and over an outlet roller 20.

From the foregoing it will be seen that the article to be treated is handled in a straight line, being bent only slightly at the points of application of the rollers 15—16 and 19—20. This results in the elimination of substantial bends in the article, or numerous guide sheaves therefor. In addition, the article is both treated and die-wiped under pressure, resulting in greater uniformity.

In the embodiment described hereinbefore, wherein the vessel or treating chamber 4 is immersed in the treating medium, there is provided a vertical shaft 23 for supporting the said vessel or treating chamber. This vertical shaft 23 may be elevated by means of a conventional elevating mechanism 25. According to such construction, the starting end of the article to be treated may be threaded through the vessel or treating chamber while the latter is entirely out of the liquid treating medium.

Referring to Figure 2, I have disclosed a modified form of the invention as comprising a vessel or treating chamber 40 having disposed peripherally thereof, and in spaced relationship thereto, a jacket 41. Within this jacket 41 there is disposed a helical strip 43 which occupies the annular space between the chamber 40 and the

jacket 41. A heating medium is introduced at one end of the chamber 40, as shown at 45, and exhausted therefrom at the other end 46 thereof. The treating medium is supplied to the vessel or treating chamber 40 under pressure, in the manner of the embodiment of Figure 1. According to this embodiment the vessel or treating chamber 40 need not be immersed in the liquid treating medium within the tank 1.

While I have shown and described several specific embodiments of the present invention, it will be seen that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. Apparatus for applying a liquid treating medium to a tenuous article as it travels there-through, comprising a vessel having inlet and outlet compression dies for the passage there-through of said article, a supply tank at least partially surrounding said vessel, a pump located in said tank for supplying said vessel with liquid treating medium under pressure, means for maintaining the liquid in said vessel under pressure as the strip passes therethrough, and means for returning the liquid treating medium from the vessel to the tank.

2. Apparatus for applying a liquid treating medium to a tenuous article, comprising a vessel having inlet and outlet openings for the passage therethrough of said article, a supply tank at least partially surrounding said vessel, means for elevating said vessel so that the openings therein will be above the level of the liquid treat-

ing medium in the tank, and a pump located in said tank for supplying said vessel with liquid treating medium under pressure.

3. Apparatus for applying a liquid treating medium to a tenuous article as it travels there-through, comprising a vessel having inlet and outlet openings for the passage therethrough of said article, a supply tank disposed beneath and partially surrounding said vessel, the openings in said vessel being disposed above the level of the liquid treating medium in the tank, a pump located in said tank for supplying said vessel with liquid treating medium under pressure, means for maintaining the liquid in said vessel under pressure as the strip passes therethrough, and means for returning the liquid treating medium from the vessel to the tank while maintaining pressure in the vessel.

4. Apparatus for applying a liquid treating medium to a tenuous article as it travels there-through, comprising a vessel having inlet and outlet openings for the passage therethrough of said article, a supply tank disposed beneath and exposed to said vessel, the openings in said vessel being disposed above the level of the liquid treating medium in the tank, a supply line leading from said tank to said vessel, a pump located in said supply line for supplying liquid treating medium under pressure to said vessel, an outlet for returning the medium from said vessel to said tank, and a relief valve in said outlet for maintaining the liquid in said vessel under pressure as the strip passes therethrough.

HUGH R. GRAHAM.