United States Patent [19]

Walukonis, Jr. et al.

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[54] **LATEX APPLICATOR**

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[73] Assignee: **Anaconda Wire and Cable Company**

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[52] **U.S. Cl.** **118/420**

[51] **Int. Cl.** **B05c 3/154**

[58] **Field of Search** ..... 118/420, 429, DIG. 19; 65/3; 117/115; 117/128, 128.4, 128.7, 126, 131, 132, 133

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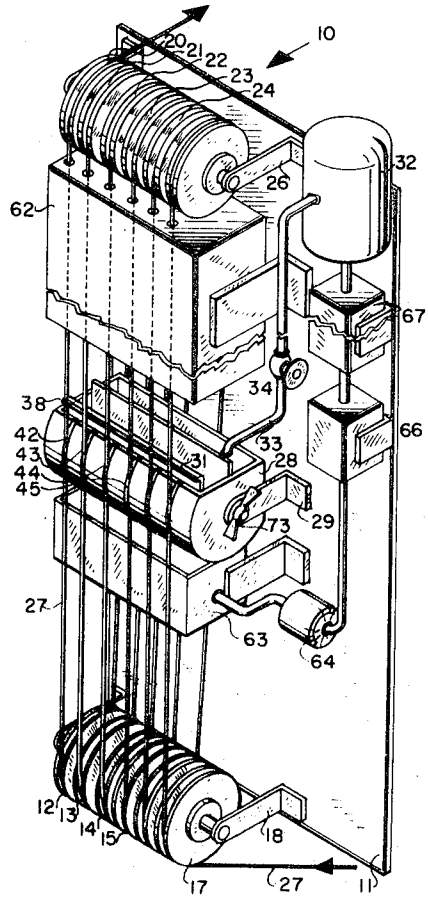
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[57] **ABSTRACT**

Large wires are coiled with latex by pulling them upward through curved channels down which the latex continuously flows. Flow rate is controlled by means of a weir in the tank and bubbles are broken up by flowing the latex through apertures in a submerged baffle.

4 Claims, 4 Drawing Figures



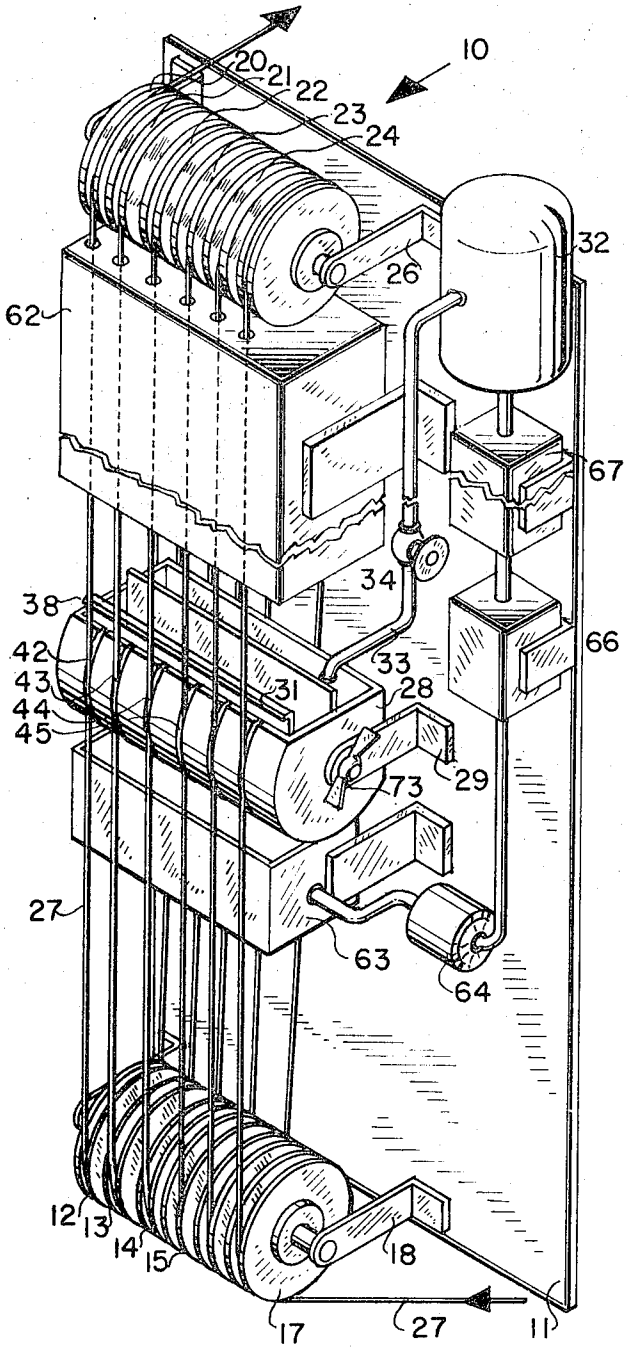


Fig. 1

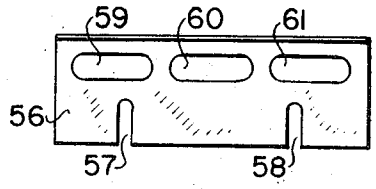


Fig. 4

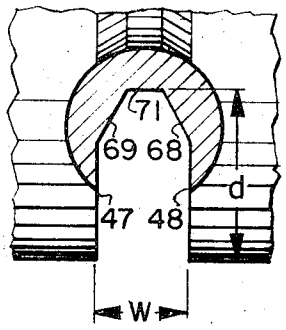


Fig. 3

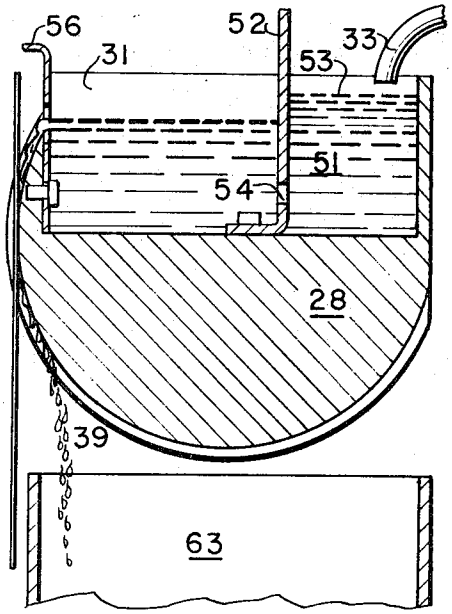


Fig. 2

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LATEX APPLICATOR

BACKGROUND OF THE INVENTION

It has long been known to apply repeated coatings to moving wires and strands by passing them up through a tank of the coating composition into a drying and/or curing zone whence the strand is returned through the bottom of the tank. This type of apparatus has not proven satisfactory, particularly for heavy strands, and for the application of latices for several reasons. In entering or returning to the tank the strand has usually either to pass through an opening in the bottom or to pass around a pulley that is submerged in the composition. In the former case it is difficult to keep the entrance seals from eventually leaking, and, if they are too tight, from damaging previously applied coating layers. Submerged pulleys require very deep coating tanks and present problems for cleaning and threading. In many cases a submerged pulley introduces an undesirable degree of agitation. An additional problem that is inherent in apparatus for passing strands up through a tank is created by the change in properties of latex coating material at the air-latex interface on the surface through which the strand must pass. A slight skin forms on this surface through oxidation, evaporation, and dust contamination. This skin deposits on the rising strand in the form of lumps.

It has also been known to apply latex to upwardly moving strands by means of grooved pulleys tangent to the strands where latex was introduced into the grooves of the pulleys in which it was retained by surface tension. This apparatus was limited to grooves no wider than would hold the latex web through surface tension and was subject to an accumulation of solids from the latex during each rotation. If, at any time, the pulleys broke the latex surface they would carry in air bubbles, as would the entering strand and these would form air holes and blisters in the coating.

SUMMARY

We have invented an apparatus that will coat heavy wires or strands, by which we refer to wires over 18 Awg (American Wire Gage) and including at least 8 Awg, with latex wherein the latex is flowing when it contacts the wires and is free from skin occlusion or air bubbles. Our apparatus comprises tank means holding a supply of latex, weir means restricting a flow of latex from said tank means and a fixedly mounted curved member comprising a portion extending from the weir means downwardly, forwardly and rearwardly and defining at least one channel for flowing the latex. Our apparatus also comprises means continuously advancing the wire upwardly through the channel with the channel conveying excess latex downwardly and rearwardly away from the wire by means of the rearwardly extending portion. Advantageously we provide means for vertically adjusting the weir means and babble means within the tank means to prevent surface movement of latex from a supply means to the weir means. Preferably, a cross section of our channel comprises parallel sides in vertical planes, a flat normal to the sides, and slants coextensive with the flat and the sides. The slants are shorter than the flat and form sharply defined angles with it and with the sides to form a channel in which the deposit is at least invention may be gained from a consideration of the embodiment of the drawing.

BRIEF DESCRIPTION OF THE DRAWING:

FIG. 1 shows a pictorial side view of the apparatus of our invention.

FIG. 2 shows a section of an embodiment of the apparatus of our invention.

FIG. 3 shows a detail, partly in radial section, of an element of the apparatus of our invention.

FIG. 4 shows a front view of a weir comprised in our apparatus.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Referring first to FIG. 1, a wire coating apparatus, indicated generally by the numeral **10** comprises a vertical frame **11** from which a plurality of lower sheaves **12, 13, 14, 15, 16, 17** are supported by brackets **18** and a plurality of upper sheaves **19, 20, 21, 22, 23, 24** are supported by brackets **26**. A wire **27** to be coated is paid from a supply, not shown, onto the sheaves **12** thence over the sheave **19**, and thence back and forth around the lower and upper sheaves until it is taken up by capstan means, not shown, from the sheaves **24**. Between the lower and upper sheaves a block **28** is supported from the frame **11** by brackets **29**. This block is hollowed out, as can best been seen in FIG. **2**, to form an applicator tank **31** which is continuously supplied with latex, such as acrylic latex, from a supply tank **32** through a pipe **33** and valve **34**. The block **28** is curvilinear on its forward and lower surface **36** which surface comprises a portion that extends downwardly and forwardly from a flat top area **38**. The most forwardly curved area of the portion **37** intercepts the plane formed by the vertically rising lengths of the wires **27** leaving the sheaves **12–17** and thence curves downwardly and rearwardly in a portion **39** of the surface **36**. The surface **36** is most conveniently cylindrical although other curvilinear shapes can be used so long as they are smooth and continuous from the top of the block to a rearward lower point. Into the surface **36** a plurality of channels **41, 42. 43, 44, 45, 46** with vertical walls such as the walls **47, 48** of the channel **41** enlarged in FIG. **3**. The tank **31** is effectively divided into **2** compartments **49, 51** by a vertical baffle plate **52** bolted to the floor of the tank in such a manner that the latex which enters the tank **31** enters the compartment **51** and cannot pass into the compartment **49** except through a plurality of small perforations **54** near the bottom of the baffle. By this means any air bubbles introduced into the tank from the pipe **33** are prevented from entering the compartment **49** and there is no flow from one compartment to the other across the surface of the latex in the tank. The latex in the compartment **49** flows freely into the channels **41–46** except as such flow is controlled by a weir **56** in the form of a plate (FIG. **4**) that bolts to the front wall of the tank **31**. Bolts holding the weir **56** fit through slots **57, 58** so that the height of the weir in the tank is adjustable. Three elongated holes **59, 60, 61** in the weir **56** provide the opening for the flow of latex into the channels where it coats the wire **27** and is baked dry on the passage of the wire through an oven **62** below the sheaves **20–24**. Excess latex flows through the channels in the portion **39** of the surface and drips into a drainage tank **63** from whence it is pumped by means of a pump **64** through a filter **66** and heater **67** back to the supply tank **32**. By

this means the moving wire **27** is always in contact with a freshly flowing, unstagnated, bubble-free supply of the latex **53** and the amount deposited is precisely controlled both by means of the adjustable weir **56** and by virtue of the fact that the latex does not drip down the wires but is carried rearwardly away from the wires into the tank **63**. Thus the area of wire being flooded with latex is always the same without requiring that the wire pass through any seal. We have tried different sectional contours for our channels **41–46** and have found that, for wires of size 18–8 Awg, a channel having a section seen in FIG. **3** with the parallel walls **47, 48** and a broad flat **68** which is joined to the walls by shorter slants **69, 71** has an unexpected efficiency in accepting a filling of latex around the ascending wire and carrying away the excess into the tank **63**. Most efficaciously the depth "d" of our channels exceeds their width "w," for example where the width had a value of 0.120 inch and the depth a value of 0.175 inch the same channel was effective in coating wires ranging from 8–14 Awg.

In mounting the block **28** in the brackets **29** the brackets are slotted at **72** to provide an option of changing the forward tilt of the block somewhat by means of bolt and wingnuts **73**. This permits a further precise adjustment of the rate of flow of latex within the channels and control of the amount of coating deposited on the wire. We have described an apparatus for applying a six layer coating on a single strand, but it will be readily understood that our apparatus can be used for simultaneously applying coatings to a plurality of strands and that more or fewer coatings may be applied at will within the scope of our invention the foregoing description of which has been exemplary rather than definitive and for which we desire an award of Letters Patent as defined in the following claims.

We claim:

1. An apparatus for coating heavy wire with latex comprising,

a. tank means holding a supply of said latex,

b. weir means restricting a flow of latex from said tank means and means for vertically adjusting said weir means

c. a fixedly mounted curved member comprising portions extending from said weir means downwardly, forwardly and rearwardly, said member defining at least one channel for flowing said latex,

d. means continuously advancing said wire upwardly through said channel, said wire being coated with said latex within said channel, and said channel conveying excess latex downwardly and rearwardly away from said wire by means of said rearwardly extending portion, supply means continuously flowing said latex into said tank means, and baffle means within said tank means preventing surface movement of said latex from said supply means to said weir means.

2. The apparatus of claim **1** wherein said channel comprises, in section, parallel sides in vertical planes, a flat normal to said sides, and slants, shorter than said flat, coextensive with said flat and said sides.

3. The apparatus of claim **1** wherein the depth of said channel is at least equal to its width.

4. The apparatus of claim **2** wherein the depth of said channel is at least equal to its width.

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