June 18, 1929. J. J. MASCUCH 1,717,460

APPARATUS FOR ELECTROPLATING METALLIC BANDS

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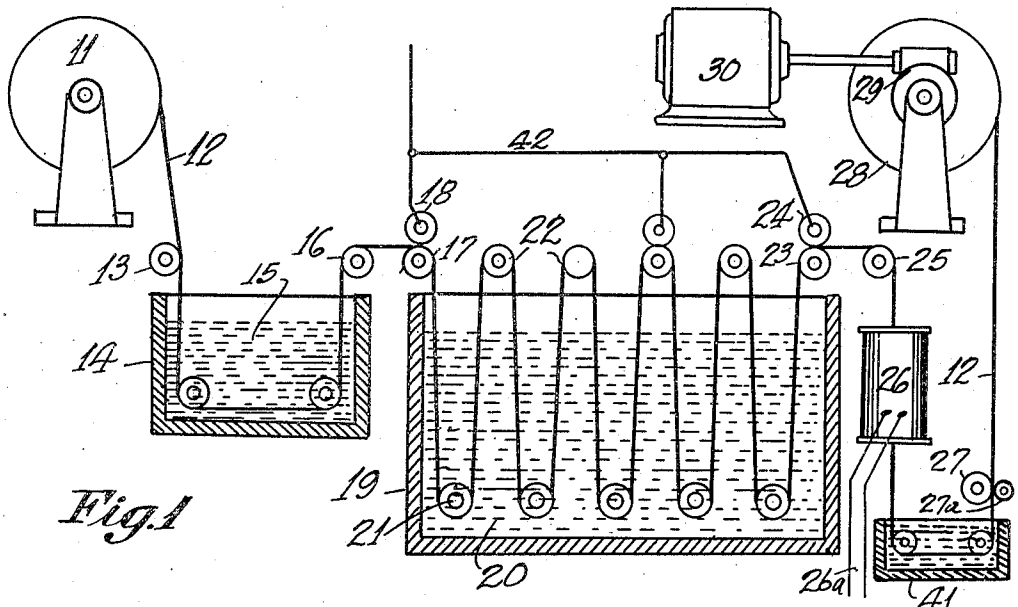


Fig. 1

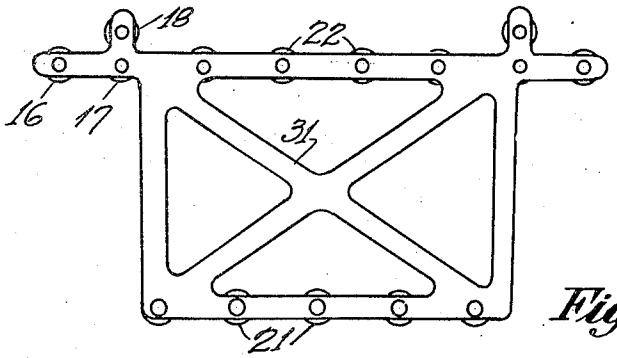


Fig. 2

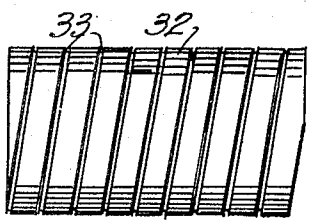


Fig. 3

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APPARATUS FOR ELECTROPLATING METALLIC BANDS.

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This invention relates to apparatus for electro-plating metallic bands and has for an object to electro-plate strip metal by a continuous process, another object is to place the strip vertically in the electro-plating vat which may be of considerable depth, another object is to pass the strip around rollers between the various degrees of plating which prevent the accumulation of hydrogen bubbles and a further object is to heat the strip after the plating operation is completed with a view to fusing the nickel of the plating into the metal of the strip. Other objects of the invention will appear from the following specification and the accompanying drawings, in which, Fig. 1, is a schematic plan for carrying out this process with the vats shown in section, Fig. 2 is a form of frame that may be used to support the rollers and Fig. 3 shows an electro-plated flexible metallic tube manufactured from strip produced by this process.

The common practice in electro-plating is to immerse the object to be plated in the plating vat connected in circuit with the anode for a period of from ten to twenty minutes according to the depth of the plating desired. In some instances the object is removed at intervals from the vat and reimmersed with the object of producing "agitation" to remove hydrogen bubbles, otherwise the object remains stationary in the vat.

The present invention is for use mainly, but not exclusively, on flexible metallic bands which are handled on reels. Stock of this character is easily handled on rollers and can be taken through the vat by a tortuous path, being continuously fed from a reel at one end and delivered to another reel at the other end, the time of the take-up regulating the time of immersion.

In the present invention a row of insulated rollers are provided in a frame near the bottom but above the sediment line of the vat and a companion row of rollers are provided above the liquid level of the vat. The strip of metal to be plated is carried up and down in the vat over these rollers by a continuous movement in a vertical direction. This movement of the strip in the liquid produces the necessary agitation, preventing the accumulation of hydrogen bubbles or other impurities settling on the strip. The movement over the rollers further aids in this direction. Electrical connection is made with the strip at one or more of the exposed rollers. After the plating is completed the strip is, preferably, heated by a heating coil which anneals the stock and fuses the plating into the material. If a polished article is desired, the strip is passed over polishing rollers and finally wound upon the take-up reel; the entire operation being automatic from beginning to end.

Referring to the drawings, 11 is a reel of strip 12, which is directed into the cleaning vat 14 over roller 13 and passes over rollers in this vat which may be filled with any of the well known cleaning solutions. On leaving vat 14 it passes over roller 16 and is engaged by rollers 17 and 18 where it enters the plating vat 19 filled with the plating solution as indicated at 20. A row of porcelain rollers 21 are provided adjacent the bottom of this vat and a companion row 22 are provided above the solution. The strip stock is fed around these rollers as shown with the upper end passing out of the fluid between each pair of rollers.

On leaving the plating vat the stock passes between the rollers 23 and 24 and over the roller 25, through the heating coil 26 which is electrically energized by the circuit 26ª into the cooling vat 41, between the polishing rollers 27 and 27ª and then to the take up reel 28 which is driven by the worm 29 and motor 30. Electrical connections 42 to the strip may be made through one or more rollers corresponding to 18 or 24. The rollers 18 and 24 engage the strip as it passes over the opposing rollers 17 and 23 respectively to make electrical contact therewith.

For convenience in assembly the top and bottom row of rollers are preferably mounted in a frame as in Fig. 2 which is made from insulating material and may be lifted from or inserted in the vat.

The strip stock, after plating, may be used for any purpose, as for instance, forming into metallic tubing Fig. 3 in ridges separated by the spiral groove 33. Tubing formed in this way is plated all over and is less expensive than plating after forming into the tube.

Having thus described my invention, I claim:

1. In an electro-plating apparatus for strip stock as described, the combination, a plating vat, an integral frame of insulating material having a top bar and a bottom bar, said top bar engaging the upper edges of the vat and holding the lower bar suspended in

the vat, a row of rollers on the upper bar and a row of rollers in aligned relation supported by the lower bar, the stock to be plated being passed alternately between the upper and the lower row of rollers and a pair of rollers on the upper bar for engaging said stock between said rollers.

2. In electro-plating apparatus for the continuous electro-plating of strip stock as described, the combination, a plating vat, an integral frame of insulating material having a top bar and a bottom bar, projections on said frame engaging the edge of the vat to hold the bottom bar suspended in the vat, a row of rollers on the top bar and a row of rollers supported by the bottom bar, the stock to be plated being passed alternately between the upper and lower rows of rollers and a roller connected with an electric supply engaging said stock as it passes over one of said upper rollers.

3. In electro-plating apparatus for the continuous electro-plating of strip stock as described, the combination, a plating vat, a frame of insulating material having a top bar and a bottom bar, projections on said frame engaging the edge of the vat to hold the bottom bar suspended in the vat, a row of rollers supported by the top bar and a row of rollers supported by the bottom bar, the stock to be plated being continuously passed alternately between the upper and lower rows of rollers and a plurality of rollers connected with an electrical supply engaging said stock as it passes over opposing rollers in the top bar.

In testimony whereof I affix my signature

JOSEPH J. MASCUCH.