

United States Patent Office.

ALFRED PARAF, OF MULHOUSE, FRANCE.

Letters Patent No. 64,135, dated April 23, 1867.

IMPROVED COPPER-COATED IRON ROLLS FOR PRINTING AND FINISHING.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, ALFRED PARAF, of Mulhouse, in the Empire of France, have invented certain new and useful improvements in the Method of Coating Iron with Copper in the Manufacture of Printing or Finishing Rollers; and I hereby declare the following to be a full, clear, and exact description of the same.

Iron has heretofore been coated with copper, but such coating has been but imperfectly combined with the iron, so that it could only be used in very thin layers for ornamental or protecting purposes; and it has been found utterly impracticable to give to iron rollers a coating of copper sufficiently thick to enable it to be engraved for printing purposes, as such coating could not be made to adhere to the iron.

The object of my invention is, therefore, to intimately combine a coating of copper, of any desired thickness, with iron; and this I have effected by causing the initial coating to form an intimate union with the iron. To this effect I proceed as follows: The roller is formed of cast iron, which must not be too hard, so that it may be easily turned and polished. After the roller is cast, it is necessary to turn it in a lathe to the required dimensions, after which it is filed and finally polished, between two pieces of wood, with emery and water. It is then well cleaned, and placed in a wooden box which contains a copper solution and a copper plate. The copper bath I prepare in the following manner: three hundred grammes sulphite of soda; five hundred grammes cyanide of potassium; three hundred and fifty grammes acetate of copper; two hundred grammes ammonia; twenty-five litres of water. The bath is as alkaline as possible, for an acid solution will produce a finely granulated or crystalline deposit, which prevents the copper from adhering to the iron. The copper plate should be put in communication with the positive pole of an electric pile, and the iron roller with the negative pole of the same. After the electricity has been on for thirty or forty minutes, the roller is well brushed with a brass or copper brush, in order to take away the whole amount of copper deposited during these thirty or forty minutes. Care should be taken in this operation to keep the roller immersed in the copper bath, and to take out that part only which is brushed. After this the reaction is allowed to go on for four or six days, according to the temperature, during which time eight of Bunsen's elements should be used, which, of course, have to be in working order all the time. At the expiration of this time the roller is taken out, washed thoroughly in water, closed at each end, then immersed for half a minute in nitric acid, then thoroughly washed again in water, and again placed in contact with electricity in a copper bath which I prepare in the following manner: twenty-two parts sulphate of copper; seven parts sulphate of soda; ten parts sulphuric acid, and enough water to make it stand 30° T. For the second immersion four of Bunsen's elements are sufficient. The roller must remain in this bath for from eight to ten days, and it is then taken out, well washed, turned, polished, after which it will be ready for engraving. By this process a heavy coating of copper is formed, which is combined and united intimately with the iron. The preliminary operation of brushing the primary copper deposits from iron is quite essential to this result, as the iron is not passive at first to the action of the pile, and consequently the coating formed in the first few minutes after the iron has been immersed in the bath, and subjected to the action of the electric current, does not adhere with the requisite tenacity. The copper coating, by the process above described, may be of any desired thickness, so that the roll can be engraved, and used in the place of the ordinary roll employed in print-works for printing or finishing calico and other goods.

Having described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

As a new manufacture, making printing or finishing rollers of cast iron, and coating the same with copper, substantially in the manner and by the means herein specified.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

ALFRED PARAF.

Witnesses:

A. POLLOCK,

EDW. F. BROWN.