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UNITED STATES PATENT OFFICE.

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DRAWING OR ROLLING PROCESS.

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To all whom it may concern:

Be it known that we, JEAN GUILLAUME DE LATTRE and HENRY HARDY, the first a citizen of the Republic of France, and the second a subject of the Belgian Kingdom, both residing at Paris, Seine Department, No. 2 Avenue Alphand, in the Republic of France, have invented certain new and useful Improvements in Drawing or Rolling Processes, of which the following is a specification.

When pieces of metal are subjected to the drawing or rolling process, it is generally found necessary after each passage through the machine, to proceed with an annealing of the pieces in order to prevent any hardening of the metal, the said pieces being then cleaned by the dipping process so as to remove the oxides resulting from the annealing. To obviate such operations, which are expensive as well as prejudicial to the good qualities of the metal, it has been proposed to cover the pieces with a thin layer of a soft metal which acts as a lubricating substance, and in this manner the piece is enabled to traverse the machine several times without annealing. Lead or its alloys were considered useful for this purpose, but attempts made in this direction failed to give practical results, since the lead could not be made to adhere to the pieces in the proper manner, nor could the pieces be properly drawn out, for the lead showed a tendency to clog up the drawing dies, and it was also difficult to remove the layer from the finished pieces, this being however necessary to make them saleable.

In the present invention, we obviate these drawbacks by depositing upon the said pieces a layer of copper and mercury or brass and mercury, the mercury forming an amalgam.

Our process is for example as follows:

The pieces are carefully cleaned by dipping and are then covered with a thin layer of amalgam by the electrolytic process, using a bath having as a base salts of copper, zinc and mercury, preferably composed as follows:

	Grams.
Sulphitocyanide of copper and potassium	25
Sulphotocyanide of zinc and potassium	25
Cyanide of mercury	3
Water	about 980

The whole forms a litre of solution having density 1.034 and resistivity 18=25.

The sulphitocyanide of copper and potassium has the formula $Cu_2(CN)_26KCN.K_2SO_3$ and is obtained by the combination of copper cyanide $Cu_2(CN)_26KCN$ with potassium sulphite K_2SO_3.

Likewise, the sulphitocyanide of zinc and potassium is obtained by the combination of zinc cyanide with potassium sulphite.

The formula for the cyanide of mercury is $Hg(CN)_2$.

The preferred conditions for electrolysis are the following:

Current tension=2–4 volts.
Current density=.2 amperes per dm^2.
Temperature of the bath=30° C.

The above conditions are not absolutely indispensable, and can be somewhat varied without departure from the invention.

Due to the presence of mercury, which is the softest of the metals, the layer deposited upon the pieces forms the best possible lubrication; the coefficient of friction is now entirely small, and it varies but little in relation to the pressure between the friction parts; the said layer is extremely thin, and is obtained in a rapid and inexpensive manner; it adheres very strongly even in the case of iron or steel pieces, and it can be entirely removed in a ready manner after the completion of the work, with recovery of the various metals.

Claims:

1. A process for forming a metallic lubricating coating upon articles to be subjected to drawing, rolling, or the like, comprising, electrolytically depositing upon the articles a layer of copper and mercury forming an amalgam.

2. A process for forming a metallic lubricating coating upon articles to be subjected to drawing, rolling, or the like, comprising, electrolytically depositing upon the articles, a layer of brass and mercury forming an amalgam.

3. A process for forming a metallic lubricating coating upon articles to be subjected to drawing, rolling, or the like, comprising, electrolytically depositing upon the articles a layer of copper and mercury forming an amalgam, the electrolytic bath used consisting of a solution of copper and po-

tassium sulphitocyanide, and mercury cyanide.

4. A process for forming a metallic lubricating coating upon articles to be subjected to drawing, rolling, or the like, comprising, electrolytically depositing upon the articles, a layer of brass and mercury forming an amalgam, the electrolytic bath used consisting of a solution of copper and potassium sulphitocyanide, zinc and potassium sulphitocyanide, and mercury cyanide.

In testimony that we claim the foregoing as our invention we have signed our names.

JEAN GUILLAUME DE LATTRE.
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