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ELECTROLYTICALLY POLISHING STAINLESS STEEL

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2 Claims. (Cl. 204—140)

This invention relates to the electrolytic polishing of stainless steel.

This is a continuation-in-part of applications filed May 15, 1940, bearing Serial Nos. 335,352 and 335,353.

According to this invention, the stainless steel is electrolytically polished by making the steel the anode in an electrolyte consisting of a solution of one part, by volume, of a solution of 60% chromic acid and 40% water, by weight, and from two to four parts, by volume, of a water solution of an acid of the class consisting of acetic and formic acids, the acetic acid solution consisting of 99.8% acid and .2% water, by weight, and the formic acid solution consisting of 90% formic acid and 10% water, by weight. The current density ranges from 150 to 350 amperes per square foot of anode surface, and the electrolyte temperature should not exceed 90° F. Best results are secured by the restricted use of the described water solution of the acid of the class mentioned, to three parts of this solution, by volume, to one part, by volume of the chromic acid solution, and by restricting the current density range to from 250 to 350 amperes per square foot of anode surface, which is the stanless steel surface. The electrolyte temperature should preferably be maintained at atmospheric temperature providing this does not exceed 90° F. The voltage ranges from 10 to 20 volts, higher voltages being required as the electrolyte temperature rises.

As in all electrolytic polishing methods, the time period for the treatment depends upon the amount of polishing that is to be done. In all events, it is possible to produce a very attractive polished finish on stainless steel work, whether hot finished, processed, or finished, and in the case of a finished product, such as finished wire and strip, it is possible to obtain a surface that is free from even microscopic imperfections, it being a true mirror finish.

We claim:

1. A stainless steel electrolytic polishing method comprising making the steel the anode in an electrolyte consisting of one part, by volume, of a solution of 60% chromic acid and 40% water, by weight, and from two to four parts, by volume, of a water solution of an acid of the class consisting of acetic and formic acids, the acetic acid solution consisting of 99.8% acetic acid and .2% water, by weight, and the formic acid solution consisting of 90% formic acid and 10% water, by weight, at a current density of from 150 to 350 amperes per square foot of anode surface and with the electrolyte temperature not exceeding 90° F.

2. A stainless steel electrolytic polishing method comprising making the steel the anode in an electrolyte consisting of one part, by volume, of a solution of 60% chromic acid and 40% water, by weight, and three parts, by volume, of a water solution of an acid of the class consisting of acetic and formic acids, the acetic acid solution consisting of 99.8% acetic acid and .2% water, by weight, and the formic acid solution consisting of 90% formic acid and 10% water, by weight, at a current density of from 250 to 350 amperes per square foot of anode surface and with the electrolyte temperature not exceeding 90° F.

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