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METHOD OF STRIPPING COPPER PLATE

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6 Claims. (Cl. 75—97)

This invention relates to a method of stripping copper plate or similar coatings from a basis metal article.

It has heretofore been the custom in stripping copper plate from, for example, zinc die castings, to rely primarily on mechanical removal such as buffing, grinding or the like. It has also been proposed to immerse the copper plated article in a relatively strong acid solution to dissolve the copper, with or without the use of electric current. Each of these methods possesses the disadvantage that it will not accomplish satisfactory results when used on an article having a highly irregular configuration. For example, in stripping copper plate from a die cast radiator grille for an automobile, certain parts of the grille are inaccessible to a grinding or buffing wheel and mechanical removal is therefore unsatisfactory. In articles such as these, the thickness of the plated metal is non-uniform due to the irregular configuration. If it is attempted to strip the copper by strong acid, it will be found that the thin portions of the copper plate are removed first and the thicker parts removed only after the acid has attacked the basis metal and altered the surface configuration of the article.

The present invention has as its primary object to overcome the disadvantages of each of the above methods and, by proper control, to remove copper plate from irregular articles successfully and without attacking the basis metal.

The invention consists in immersing the copper plated article in a solution which contains a material which will react with the copper to form a compound thereof, and subsequently immersing the article in a solution capable of dissolving the compound so formed. Specific details of the method and its advantages will become apparent from the following specification.

A copper plated article such, for example, as a die casting, is immersed in a solution containing a sulfide capable of reacting with the copper to form copper sulfide. The dissolved sulfide may be any of the sulfides or polysulfides of hydrogen, ammonium, sodium or potassium or any others which will react to form a sulfide of copper. The article is left in this solution until the surface is completely black and until all of the copper has been acted upon. The length of time necessary for the reaction depends on the concentration of the solution, thickness of the copper plate, temperature and other factors, but can be readily determined by trial and error.

The article, which now has a surface coating of black copper sulfide, is next immersed in a second solution containing a material capable of reacting with the copper sulfide to remove it from the article. Sodium or potassium cyanides have been found suitable for this purpose.

If, on inspection of the article as it is removed from the cyanide solution, it is found that some copper still remains on the article, the process may be repeated. By maintaining the pH value of the initial solution such that the solution is neutral or slightly alkaline, the dissolved sulfides either do not react with the zinc of the basis metal or react so slowly that no damage is done to the surface of the article. It is possible for the sulfides to combine with the copper in acid solutions, but the higher the acid content, the more readily the base metal is attacked.

The removal of the copper sulfide from the article is accelerated by maintaining a relatively high cyanide concentration in the second solution.

What I claim as new and desire to secure by United States Letters Patent is:

1. The method of stripping copper plate which comprises immersing a plated zinc article in a substantially neutral solution containing one of the group consisting of the sulfides and polysulfides of hydrogen, ammonium, sodium and potassium and subsequently immersing the article in a solution containing cyanide of an alkali metal which reacts with the copper sulfide to remove it from the article.

2. The method in accordance with claim 1 in which the first solution contains sulfide of an alkali metal.

3. The method in accordance with claim 1, in which the first solution contains hydrogen sulfide.

4. The method in accordance with claim 1, in which the second solution contains sodium cyanide.

5. The method in accordance with claim 1, in which the second solution contains potassium cyanide.

6. The method of stripping copper plate from a zinc die casting which comprises immersing the plated casting in a solution which is not acid nor more than slightly alkaline, and comprises sulfide of an alkali metal, continuing the action until the metallic copper is converted into copper sulfide, thereafter immersing the article in a solution containing cyanide of an alkali metal, and continuing this immersion until the copper sulfide is dissolved in said solution.

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