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BRIGHT ZINC

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The present invention relates to a method for producing zinc coated articles and more particularly to a bath which may be employed to produce a bright finish on zinc plated articles. Heretofore zinc in the form of an electro-plated coating, although offering a high resistance to oxidation, has been supplanted to a great extent by other and more expensive metals which offer a more attractive appearance. We have found however, that it is possible to produce a very bright zinc coating which in appearance compares favorably with bright coatings of other and more expensive metals such as cadmium.

In carrying out our invention, we may employ any plated zinc articles. It is preferable however to form the initial zinc coating on a foundation metal in the following manner: The metal to be plated should be cleaned thoroughly and if it is an alloy high in carbon it may be found desirable to give it a sulphuric acid, anodic, electro-plating treatment. The cleaned article is then electroplated in a bath, the optimum composition of which is about 10 ozs. per gallon of sodium cyanide, 8 to 10 ozs. per gallon of sodium hydroxide and 8 to 10 ozs. per gallon of zinc cyanide. A lower concentration of zinc cyanide results in a lower cathodic efficiency and better throwing power, but variations in the metal concentration do not affect the brightness and plating characteristics as markedly as variations in the sodium cyanide and caustic soda contents. Higher concentrations of sodium cyanide cause a decrease in cathodic efficiency and a slight increase in throwing power and a noticeable decrease in brightness. Higher and lower concentrations of caustic soda decrease cathodic efficiency and cause a darkening of the zinc plate. Any colloidal brightening agent may be added to the bath if desired but we have found sodium thiosulphate to be the most satisfactory, the optimum concentration employed being about ¾ oz. to the gallon, although amounts up to 2 ozs. per gallon have no detrimental effect. Sodium bisulphite up to about 4 ozs. per gallon may be added to the bath if desired and if the cyanide content of the bath is above the optimum value the addition of the sodium bisulphite reduces the cyanide content with a resultant increase in brightness of the plate. The optimum current density range for a bright zinc deposit is from about 15 to 30 amperes per square foot. The throwing power increases with higher current densities, with lower metal concentrations, or, in general, the factors which cause increased cathodic polarization.

After the zinc coating has been plated on the foundation metal, the plated article is rinsed carefully and then dipped in a brightening solution which consists substantially of 10 to 60 ozs. of chromic acid per gallon, .05 to 5 ozs. of anhydrous sodium sulphate per gallon and .1 to 1 oz. of nitric acid per gallon. After dipping the zinc plated article in this solution, it is again rinsed. The optimum values of the ingredients of the brightening bath are 40 ozs. of chromic acid per gallon, 2 ozs. per gallon of anhydrous sodium sulphate and .7 oz. per gallon of nitric acid. The resulting zinc coating does not stain and has a particularly bright and pleasing appearance.

What we claim as new and desire to secure by Letters Patent of the United States, is:

1. A solution adapted for the production of bright zinc surfaces, said solution containing about 10 to 60 ozs. per gallon of chromic acid, about .05 to 5 ozs. per gallon of anhydrous sodium sulphate and about .1 to 1 oz. per gallon of nitric acid.

2. A dipping solution for the production of bright zinc coatings, said solution consisting substantially of about 40 ozs. per gallon of chromic acid, 2 ozs. per gallon of anhydrous sodium sulphate and .7 oz. per gallon of nitric acid.

3. The method of producing a bright zinc coating which comprises cleaning the article to be plated, immersing the cleaned article in a solution consisting of approximately 10 ozs. per gallon of sodium cyanide, 8 to 10 ozs. per gallon of sodium hydroxide, 8 to 10 ozs. per gallon of zinc cyanide and about ¾ to 2 ozs. per gallon of sodium thiosulphate, maintaining the current density of about 15 to 30 amperes in said bath and thereafter immersing the zinc plated article in a brightening solution consisting substantially of 10 to 60 ozs. per gallon of chromic acid, .05 to 5 ozs. per gallon of anhydrous sodium sulphate and .1 to 1 oz. per gallon of nitric acid.

4. A solution adapted for the production of bright zinc, said solution containing 10 to 60 ozs. per gallon of chromic acid, .1 to 1 oz. of nitric acid, and .05 to 5 ozs. per gallon of a compound containing a sulphate radical.

5. A solution adapted for the production of bright zinc, said solution containing chromic acid, nitric acid, and a compound containing a sulphate radical, the quantity of cromic acid varying from 10 to 60 ozs. per gallon, and the total quantity of said nitric acid and compound being materially less than the quantity of chromic acid present in said solution.

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