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BRIGHT DIP

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This invention relates to a process for the cleaning of metals and more particularly to bright dipping copper and copper-containing alloys during their finishing treatment.

Heretofore it has been customary in the treatment of copper, brass, and other alloys containing a high percentage of copper, and particularly those carrying oxide scale produced during brazing or hard soldering, to pickle the finished product in acid such as sulfuric acid, nitric acid, hydrochloric acid, or mixtures thereof, some of which mixtures may contain dichromates and other coloring agents, in order to bring out a final high luster on the product. Metals so treated, however, often tarnish rapidly after contact with air and as a result the initial desirable appearance is lost before the product reaches the ultimate consumer.

An object of the present invention is to provide an improved process for the bright dipping of copper and copper-containing alloys. Another object is to provide a bright dipping bath wherein rods, tubes, and fabricated parts of copper, brass, and similar metal alloys high in copper may be treated whereby a high surface luster is obtained which is retained for a considerable period of time. Yet another object is to provide a glycolic acid bath for the bright dipping of copper and brass. Other objects and advantages of the invention will hereinafter appear.

The above and other objects may be accomplished by employing a glycolic acid bath for the treatment of copper, brass, bronze, and other alloys of high copper content (i. e., 40% copper or better) subsequent to their fabrication. Such a bath may contain from 0.25 to 50% of glycolic acid with in the order of from 1.0 to 5.0% of the glycolic acid as the preferred concentration. The bath may be used hot or cold although its effect is more rapid with a heated solution. Moreover, it has the outstanding advantage in contradistinction to the strong acid baths heretofore used in bright dipping in that even when hot it does not give off suffocating vapors which render the use of the strong acid baths not only restricted to locations where excellent ventilation is provided but also restricted because of the physiological effects.

Ordinarily a glycolic acid bath, either hot or cold, is suitable for the treatment of metals subject to normal discoloration but if the article is coated with a deep scale it is often desirable to employ an electrolytic bath with glycolic acid as the electrolyte. Baths of this nature are especially effective if during the brightening operation the parts being brightened are alternately made the anode and the cathode by reversal of the polarity of the electrical current.

Glycolic acid baths are especially effective in preserving a bright color on the metal surface. This use is illustrated by the treatment of copper or brass rods, tubes, fabricated articles, and the like which are first dipped in a strong acid bath, such as one containing 8 oz./gal. sulfuric acid and 1.5 oz./gal. sodium chromate solution, to remove tarnish and heavy scale. Subsequent to washing the part from such acid treatment it is dipped into a 2% hot aqueous glycolic acid solution, removed from the bath, and the solution remaining on the part allowed to dry, or if desired, it may be removed by a hot water wash.

Copper or brass fabricated parts, with or without prior bright dipping in strong acid baths, may be tumbled in a glycolic acid bath whereby an excellently finished product is provided.

Glycolic acid, while it is an effective agent for the bright dipping of the aforesaid metals, may also be used with other materials such as tartaric acid, calcium acid phosphate and the like. Furthermore, while glycolic acid is adaptable as a bright dipping medium and tarnish removing material even at fairly low concentrations, in applications wherein it is desired to restrict surface etching to the minimum amount salts, and more particularly the alkali metal and alkaline earth metal salts of glycolic acid, and particularly the sodium and potassium salts thereof, may be employed. In these instances the cleaning appears to be effected by the glycolate ion in solution.

I claim:

1. A process for preserving the color of high copper-containing metals which comprises dipping a metal containing at least 40% copper into an aqueous glycolic acid bath.

2. A process for preserving the color of high copper-containing metals which comprises dipping a metal containing at least 40% copper into an aqueous glycolic acid bath containing from 0.25 to 50% glycolic acid at a temperature between 100 and 212° F.

3. A process for preserving the color of high copper-containing metals which comprises dipping a metal containing at least 40% copper into an aqueous glycolic acid bath containing from 1.0 to 5.0% glycolic acid at a temperature between 100 and 212° F.

4. A process for preserving the color of copper parts which comprises dipping bright colored fabricated parts of copper into an aqueous glycolic

acid bath containing from 1.0 to 5.0% glycolic acid at a temperature between 100 and 212° F.

5. A process for preserving the color of brass parts which comprises dipping bright colored fabricated parts of brass into an aqueous glycolic acid bath containing from 1.0 to 5.0% glycolic acid at a temperature between 100 and 212° F.

6. In a process for preserving the color of fabricated brass parts which comprises bright dipping manufactured parts fabricated of brass and thereafter preserving the bright color thereby obtained by dipping the bright brass part in a water-glycolic acid bath containing an effective amount of glycolic acid.

7. In a process for preserving the color or high copper-containing metals the steps which comprise bright dipping an alloy containing at least 40% copper in a bath of an aqueous solution of glycolic acid, removing the metal from the bath and subsequently drying it with its retained glycolic acid.

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