

UNITED STATES PATENT OFFICE

1,927,671

METHOD FOR TREATING COPPER ALLOYS

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No Drawing. Application November 10, 1931,
Serial No. 574,223, and in Japan December 30,
1930

2 Claims. (Cl. 148—6)

The present invention relates to a method for treating copper alloys such as brass or bronze articles and more particularly to a method for obtaining a bright surface thereon.

5 It is an object of the present invention to provide copper alloys such as brass or bronze with a brilliant surface which is capable of resisting oxidation or discoloration either at room temperature or at relatively high temperatures.

10 Heretofore copper alloy articles, for example articles of brass or bronze, have been given a brilliant surface finish by the following treatment. The articles were first immersed in a solution usually consisting of a mixture of nitric, sulphuric and hydrochloric acids; thereafter washed several times in water, then immersed in a solution of potassium cyanide or sodium cyanide, removed therefrom, washed in water and then dried as quickly as possible.

20 Copper alloy surfaces prepared in accordance with the prior process are often unsatisfactory since the alloy surface after a relatively short time turns bluish in color and later changes to a dark gray color when exposed to relatively high temperatures. This change in color may be due to the fact that when such articles are immersed in the acid solution, the components comprising the alloy, for example copper and zinc, do not dissolve evenly so that the surface of the alloy contains an excess of copper and a film of copper salt is formed thereon that cannot be removed by washing in water.

30 According to the present invention copper alloy articles to be treated are first placed in the usual mixed acid bath and then immersed in a dilute solution of chromic acid. The components of the alloy, for example copper and zinc, are thereby evenly dissolved so that an excess of copper does not occur on the surface of the alloy article. Furthermore the film of copper salt which forms on the surface is rendered readily soluble by the chromic acid. The surface of a copper alloy treated in accordance with the present invention is far more brilliant than that obtained by processes heretofore employed.

55 The surfaces of copper alloy articles, for example articles of brass or bronze, treated in accordance with the present invention do not oxidize in air either at room temperature or at relatively high temperatures. This is particularly advantageous in many cases. For example, when a copper alloy is employed in the fabrication of lamp bases it is customary to employ relatively high temperatures in joining the

base with the vitreous portion of the lamp. Ordinarily, if insufficient heat is employed the base soon becomes loosened. This defect is completely eliminated by the use of copper alloys treated in accordance with the present invention since such alloys are capable of withstanding the high temperatures employed in such a process. The present invention furthermore removes the necessity for providing a thin film of water glass to prevent oxidation of the lamp base and facilitates the printing of letters or marks thereon as well as soldering.

In carrying out my invention copper alloy articles such as brass or bronze are first immersed as usual in a solution consisting of a mixture of sulphuric, nitric and hydrochloric acids to thereby obtain a clean bright surface. The alloy articles are then washed in water and thereafter immersed in a dilute chromic acid solution. The concentration of the chromic acid solution may vary considerably but very dilute solutions have been found to be effective. For example a 0.5% solution has given good results. However, when such a weak solution is employed it is sometimes desirable to add some sulphuric acid thereto. The temperature of the chromic acid is preferably about 50° C. After the articles have been immersed from about 3 to 5 seconds in the bath they are removed, washed in water and dried. They are next immersed in a solution of potassium cyanide to which soap suds may be added if desired. The articles are thereafter washed in water and dried. The product thus obtained has a brilliant surface which does not change in color when heated at relatively high temperatures such as would produce a dark color in brass or bronze surfaces finished by the methods heretofore employed.

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

1. The method of producing a bright finish on a copper alloy which comprises immersing it in an acid solution, washing it in a chromic acid solution and thereafter immersing it in cyanide solution.
2. The method of producing a bright finish on a copper alloy such as bronze, brass or the like which comprises immersing it in a solution comprising a plurality of acids, thereafter immersing it in a chromic acid solution having a temperature of 50° C. and a concentration of about 0.5% and finally immersing it in a cyanide solution.

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