

1

3,129,111

PROCESS FOR TIN COATING COPPER PLATED MAGNESIUM

Werner F. R. Loening, Wilton, Conn., assignor to the
United States of America as represented by the Secretary of the Air Force

No Drawing. Filed May 3, 1962, Ser. No. 192,293
2 Claims. (Cl. 117-51)

This invention relates to a process for dip-coating previously copper plated metallic articles such as articles made of magnesium.

Magnesium, which is one of the more chemically active metals, is widely used on air borne equipment and for other uses where its relatively lightweight and favorable weight-strength ratio make it a desirable material. It has always been a problem to provide articles and components made of magnesium with a suitable protective coating which would protect the magnesium from a corrosive atmosphere; and in many other applications to protect the article from salt spray conditions found around salt water bodies.

Experience and controlled test results have shown that magnesium parts which have been coated by the process to be described below have superior corrosion resistance to like magnesium parts coated by previously known methods.

The primary object of the present invention is to provide a superior corrosion resistant protective coating for articles made of magnesium.

Another object of the present invention is to provide a simple plating process which eliminates some of the expensive equipment required for previous plating processes.

The process of applying the protective coating requires a dipping vat in which a mixture of 90% tin and 10% of 50-50 solder (50% tin and 50% lead) is put into solution and maintained at a temperature of 475° F. Such a solution may also be made of 95% tin and 5% lead.

The process comprises the following steps:

(1) The previously copper plated magnesium article is covered or wiped with a paste flux such as Nokorode soldering paste comprising: mineral grease (petrolatum), wax, and resin 72 to 80%, zinc chloride 20 to 25%, and ammonium chloride 3%.

(2) The article is then immersed or dipped in the dipping vat containing the tin-lead solution to stabilize its temperature with that of the coating solution.

(3) The article is then removed from the coating solution and its surface brushed with a brush saturated with the same flux used in step 1 above. The molten solu-

2

tion on the hot surface acts much like a paint being applied with a brush and covers all pores and small pits on the surface of the article. Steps 2 and 3 may be repeated if necessary until the entire surface of the article shows a satisfactory coating.

(4) The article is given a final dip in the molten solution to fuse and smooth the coating on the article.

(5) The article is removed from the molten solution and allowed to cool.

Having set forth my invention, I claim:

1. The process of applying a protective coating over a copper plated magnesium article in which the copper plated magnesium article is surface covered with paste flux, then immersing said article for a sufficient length of time to bring the article to substantially the solution temperature in a coating solution at 475° F. and comprising 90% tin and 10% of 50-50 solder, then removing said article from the coating solution and brushing the surface of said article with a brush containing said flux, then final dipping said article into said coating solution to produce a smooth coating on the article and then removing said article from said coating solution for cooling.

2. The process of applying a protective tin-lead coating on the surface of a copper plated magnesium article in which the copper plated magnesium article is wiped with a paste flux, then immersing said article in a coating solution of 90% tin and 10% of 50-50 solder at 475° F. for a sufficient length of time to stabilize the temperature of the article with the temperature of the coating solution, then removing said article from the coating solution and brushing the surface of said article with a brush containing said flux until all pores and pits are covered with the solution, then final dipping said article into the coating solution to produce a smooth coating on the article, and then removing said article from said coating solution for cooling.

References Cited in the file of this patent

UNITED STATES PATENTS

213,015 Wahl et al ----- Mar. 4, 1879
2,872,346 Miller ----- Feb. 3, 1959

FOREIGN PATENTS

3,060 Great Britain ----- of 1866

OTHER REFERENCES

Lewis: Notes on Soldering, published by Tin Research Institute, Fraser Road, Greenford, Middlesex, England, revised edition October 1959, reprinted January 1961, pp. 18, 46 and 47. (Copy in Group 160, Coating.)