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COATING OF METALLIC REFRIGERATOR PARTS

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Our invention relates to the provision of metal coated parts to be used in the interior of refrigerators, particularly electrical refrigerators. Heretofore it has been considered that metal parts exposed within a refrigerator should be protected against corrosion due to the atmospheres within the refrigerator, by a vitreous enamel coating, largely because no other coating seemed available which would stand up under the conditions to which such metallic parts were subjected. The defect in such vitreous enamel coating lies in the fact that if through accident the coating becomes broken, then the metal exposed will begin to rust and the only thing that can be done with such a metallic part is to remove the entire enamel coating and enamel it over again. This would not be true of a metallic coating which could be repaired. Furthermore, the high temperatures necessary for vitreous enamel coating limit the possibilities of a design of the metallic parts, such as the evaporator, which must be at all times completely sealed against escape of the gases used in refrigeration. Furthermore a vitreous enamel coating for an evaporator if sufficiently thick, is more of an insulator than a metallic coating would be, and hence metallic coatings would be more desirable if suitable means could be provided.

It is the object of our invention to provide a metallic coating for refrigerator parts, particularly for evaporators, and we accomplish our object by that certain method with the advantages to be subsequently pointed out and claimed.

We will describe our process with reference to an evaporator which may be of any accepted form, and is first made complete prior to the coating being applied. The evaporator as it comes from the manufacturing department is first cleaned chemically or electrically or both, preferably using a boiling caustic soda solution or a vapor degreaser such as trichlorethylene. Any rusting which has taken place is removed by pickling preferably in hot sulphuric acid solution. The evaporator is then coated with zinc, care being taken to produce a zinc coating which has a very fine grained crystalline surface that is highly nonporous. Our preferred way of accomplishing this is to pass the device through a flux, such as sal ammoniac and sawdust, immerse the product in molten zinc around 840 degrees F., with sufficient length of time to permit the metal to obtain the same temperature as the zinc, and to use a small percent of aluminum in the zinc. The metal is then quenched in water with the result of eliminating large spangles and producing the fine grained nonporous finish desired.

The zinc coating is next treated so as to render it chemically clean, which may be done by repeated treatings of the metal with hot alkaline solution followed by washing. We have used with success a first wash of sodium cyanide, tri sodium phosphate and sodium hydroxide for the first treatment followed by washing, and a potassium or sodium cyanide solution for the second treatment, followed by washing.

While the coated metal is still chemically clean, it is immersed in an electrolytic bath and electroplated with tin to a thickness of say one thousandth of an inch to one-half thousandth of an inch. Either acid or alkaline conditions may be maintained in the electrolytic bath, a suitable alkaline composition being:—

	Ounces per gallon
Caustic soda	½ to 2
Sodium stannate	8 to 18
Sodium acetate	2.0 to 4
Hydrogen peroxide (100 vol.)	¼ to ⅛
or	
Sodium perborate	⅛ to ¼

Tin chloride makes a good electrolytic solution for acid plating.

After electro-plating the piece is washed through running cold and hot water and dried, and the plated surface is mechanically treated to give it a suitable surface as by scratching, brushing or burnishing, and is then flash coated for several minutes with tin again, with the result of producing a beautiful satin or frosted finish.

Finally the article is dipped or sprayed with some one of the transparent heat and water resisting lacquers.

We have found that an evaporator provided with such a coating is inexpensive to produce as compared to vitreous enameling, among other reasons because a more uniform perfect result can be obtained, and the equipment need not be special and expensive to operate. The finish is attractive in appearance and results in a very efficient evaporator. The coating is not fragile and is very highly resistant to the particular corrosion problems to which evaporators are subjected.

Other metal parts in a refrigerator can be advantageously supplied with the coating treatment above specified, although it is the evaporator in a refrigerator which demands the special coating condition. Steel, copper or brass may be

given the coating with equal desirability, although it has been particularly designed for steel.

By reference to zinc and tin in the specification and claims, we wish to include the alloys of these metals, which possess substantially the same properties.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. An evaporator for a mechanical refrigerator formed of metal and coated with a base coating of fine grained non-spangled zinc, and a superposed coating of tin and lacquer in the order named.

2. An evaporator for a mechanical refrigerator formed of metal and coated with a base coating of fine grained non-spangled zinc, a superposed coating of tin brushed and burnished followed by a flash coating of tin and a coating of heat and water resistant lacquer.

3. That method of coating metallic parts for the interior of refrigerators which consists in forming a coating of hot zinc on the metal, quenching it, cleaning the coated article and electroplating it with tin.

4. That method of coating metallic parts for the interior of refrigerators which consists in forming a coating of hot zinc on the metal, quenching it, cleaning the coated article and electroplating it with tin, and finally coating it with heat and water resistant lacquer.

5. That method of coating metallic parts for the interior of refrigerators which consists in forming a coating of hot zinc on the metal, quenching it, cleaning the coated article, electroplating it with tin, brushing the tin coating, flash coating of the tin and finally coating with heat and water resistant lacquer.

6. That method of coating metallic parts for the interior of refrigerators which consists in forming a coating of hot zinc on the metal, cleaning the coated article, electroplating it with tin, brushing the tin coating, flash coating of the tin and finally coating with heat and water resistant lacquer.

7. An evaporator for refrigerators formed of metal on which is formed a base coating of fine grained non-spangled zinc followed by a thin electroplated coating of another metal.

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