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ART OF MAKING ENAMEL WARE

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My invention relates to improvements in the art of coating metallic articles, and specifically articles of iron and steel, with a fused and vitreous enamel.

In the practice of my invention, and beginning with the properly prepared iron or steel article—a steel wash basin, for example,—I see to it that the surface is by known means freed of substances accidentally present—the grease for example which may remain, consequent upon a pressing or spinning operation—and otherwise cleaned. To the cleaned surface of the article I apply a metallic salt associated in solution with an adhesive or binder preferably tannic acid or a tannic acid derivative. The metallic salt is, specifically, a salt of cobalt or nickel, or a mixture of the metals named; more specifically, I prefer to employ a salt of cobalt, conveniently the sulphate or the nitrate of cobalt. The adhesive may be gum arabic, but preferably it will be tannic acid or a salt of tannic acid, or it may be a substance in which tannic acid in appreciable quantity is found; it may be fustic, for example, or ox-gall, or dragon's-blood. The solution may be of varying strength, from a 10% solution to a saturated solution. A sufficient quantity of adhesive should be present to effect the end described. If tannic acid be used, a 5% solution will suffice.

Application of the solution may be made in a variety of ways. I may, for example, heat the clean-surfaced article to red heat and when the article is in such heated condition, I may spray the solution upon it. Alternatively, I may immerse the article in the solution, and after immersion I may withdraw the article and dry it, leaving it coated with an adherent film. And I have found that, in consequence of the presence of the adhesive or binder the coating of metallic salt upon the surface of the metal is more closely adherent, less susceptible to solution by moisture, and the coated surface is more resistant to rusting, than if the procedure were followed without the use of an adhesive.

In the ensuing claims when I mention tannic acid I mean to include within that term and in the field of invention the salts of tannic acid and substances such as I have named, of which tannic acid or a derivative of tannic acid is a component.

To the surface coated with such film of metallic salt, the enamel is applied, and vitrified in usual manner. For instance, the article may be dipped in a slip of enamel, dried and fired.

The enamel coating of such ware is ordinarily completed with two or more applications of enamel and with firings following each of the two repeated applications. It has hitherto been known that if in the first of the slips in which the article is dipped such metallic oxides of such metals as I have indicated be present, the enamel coating is more securely united upon the steel surface. I have found that, proceeding in the manner described, I obtain still better adhesion of the coating to the steel, and I have found that, while a second coating step may be taken, it no longer is essential to a successful job, and that by one application of enamel to the steel when coated with a metallic salt a good and serviceable enameling may be accomplished.

A known alternative method of applying the enamel is by sifting the finely ground enameling substance, essentially glass, upon the article when heated to 1800° F. or thereabouts. If the article be prepared with the film coating of metallic salt, as I have described, the adhesion of the enamel coating applied by sifting will be found to be greatly improved.

I claim as my invention:

1. In the manufacture of enamel ware the method herein described which consists in applying to the surface of a body of iron or steel a solution of an adhesive in association with a metallic salt, drying the so treated body, applying to the surface of the dried body enamel material, and firing.

2. In the manufacture of enamel ware the method herein described which consists in applying to the surface of a body of iron or steel a solution of tannic acid in association with a metallic salt, drying the so treated

body, applying to the surface of the dried body enamel material, and firing.

3. In the manufacture of enamel ware the method herein described which consists in applying to the surface of a body of iron or steel a solution of an adhesive in association with a cobalt salt, drying the so treated body, applying to the surface of the dried body enamel material, and firing.

In testimony whereof I have hereunto set my hand.

OSCAR HOMMEL.