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W. N. LEWIS

METHOD OF MAKING DECORATED CHINAWARE

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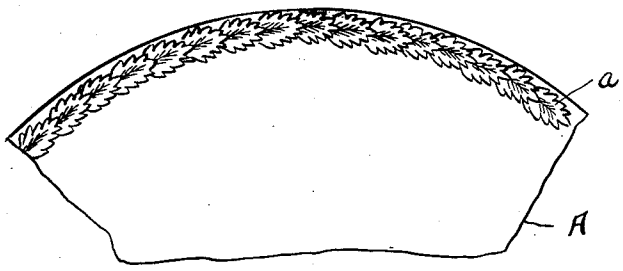



Fig 1.

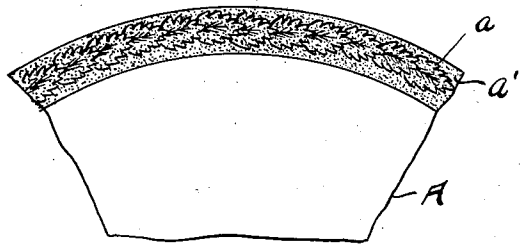



Fig. 2

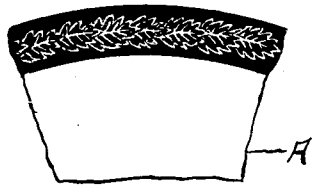



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## METHOD OF MAKING DECORATED CHINAWARE.

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In the art of ornamenting glazed ceramic ware and glass for the purpose of producing so-called encrusted metallic decorations, the current practice is to acid etch the design in the surface of the porcelain, chinaware or glass, and then to coat the design and the etched background with gold or other metallic paint to produce the corresponding encrusted effect. In acid etching the design whether as a positive, where the design stands in relief, or as a negative, where it is sunken, such design is first printed on the surface of the ware with an acid resisting ink; then the entire article aside from the design and the background is covered with acid resisting wax or similar material, and the article immersed in suitable acid until the etching has progressed to the desired depth, when it is finally washed and the wax removed.

Attempts have heretofore been made to achieve the general appearance of etched gold patterns by simpler process, or at least to obtain a two tone effect in gold or other metal having a design in dull gold with a surrounding area of a brighter tone of the same metal or vice versa. According to one such method, a mineral color is applied to form the design, the ware then fired, then a coating of gold or other metal is applied and the ware again fired. In accordance with another method, the design is applied on the ware by the use of transfer decalcomania in the usual way, the ware then fired, then a coating of gold or other metal is applied over the design and the ware fired a second time. Each of the foregoing methods, it will be observed, requires two firings, and since firing is a relatively expensive process not only per se but because of the extra handling, loss by breakage, etc., involved, neither of the methods in question have had any extended vogue.

The object of the present invention is to provide a method or process whereby the general appearance of an etched gold or other metal pattern may be obtained with but a single firing, and to this end, the invention, then, consists of the steps and resulting product hereinafter fully described and particularly pointed out in the claims, the annexed drawing and the following description setting forth in detail one method and one product exemplifying my invention, such disclosed procedure and product constituting, however, but one of various applications of the principle of the invention.

In said annexed drawing:—

Fig. 1 is a broken plan view of an article of glazed ceramic ware or glass illustrating the first step in carrying out the present improved method or process; Fig. 2 is a similar view illustrating the second step; while Fig. 3 is a similar view illustrating the finished article.

According to the present improved procedure, I first stamp or otherwise place on the surface of the article A of glazed ceramic ware or glass the desired design using as the material for such design a so-called half mat or vellum color admixed with gum arabic, gum tragacanth or other equivalent hardening and binding agent that is soluble in water but not readily soluble in the vehicle hereinafter referred to as employed in the liquid gold or other metallic paint wherewith the article is to be decorated. Preferably the material whereof the design is thus formed is spread out by means of a brush in a thin layer on a plate of glass or equivalent material and a soft rubber stamp or series of stamps is then utilized to transfer such material onto the article. Such half mat or vellum color is a trade composition of light buff or neutral color and, if desired, in order to make the design stand out more distinctly and thus assist in the placement thereof on the article as well as in the subsequent application of the metallic paint, a small amount of coloring matter, e. g., a soluble dye, may be included.

After the design shown in the form of a conventional border *a* (Fig. 1) has been thus stamped or otherwise placed on the article, it is allowed to thoroughly dry. Such drying, where gum arabic or equivalent binding and hardening agent is employed, occurs immediately and the color material is firmly held or set in a relatively hard and resistant form. "Liquid" gold, which is likewise a well known trade preparation, or other equivalent liquid metal, is then applied with a brush over the design to form a coating *a'* (Fig. 2), and due to the firm manner in which the color material is held together, and the further fact that the binding and hardening agent employed therein is substantially insoluble in the vehicle of the liquid metal, the stamped design will not be

disturbed in any way. In the case of a border design as shown, the coating in question will ordinarily be applied in the form of a band, but no limitation in this respect is implied for the design may be made up of disconnected portions, in which event the coating can be applied so as just to cover the respective portions of such design.

The exact composition of liquid gold, as well as of other so-called liquid metallic coatings employed in the ceramic art, is so far as I have been able to ascertain a trade-secret with the manufacturers thereof. The main ingredient, however, consists either of the actual metal in extremely finely divided or pulverized condition suspended in a liquid menstruum or vehicle apparently made up of one or more volatile oils, or it may consist of a resinate of the metal dissolved in essential oils. Turpentine is very commonly used as the vehicle in these preparations. In the case of such commercial liquid metals, the binding and hardening agents named above as suitable for use with the half-mat or vellum color have been ascertained by actual experiment and test to be substantially insoluble in the vehicle in which the metal is thus suspended. Accordingly, by the employment of such agent the difficulty in laying gold, for example, over half-mat colors before firing (described in Monachesi's "Manual for China Painters," published by Lee & Shepard, Boston, 1897, as calling for skill nothing short of perfection), I am on the contrary enabled to brush on the liquid metal with no more care than would be required if the half-mat design were not present, or if it had been previously fired.

In case a liquid metal having a vehicle of different constitution than the one hereinbefore identified were found available, the stated condition, viz, that the materials employed in the design should be substantially insoluble in such vehicle, or, vice versa, that such vehicle should not dissolve such materials, still remains the gist of my invention or discovery.

It will be understood that whatever the specific composition of the vehicle of the liquid gold or other metal, such vehicle disappears, i. e., is burned off in the firing, and this is equally true of the above-mentioned binding and hardening agents employed with the half-mat or vellum colors. In other words, these agents do not remain in the finished decoration but are evanescent.

The next and final step is to fire the article in the usual manner, the resulting effect being the fixing of the gold, whether in the form of a band or otherwise, with the stamped design or figure showing therethrough, as illustrated in Fig. 3. Ordinarily the design will show in dull gold with the surrounding area of a brighter tone of gold; although by building up a sufficient thickness of the coloring material employed in placing the design on the article, an actual raised or encrusted effect may be produced. While the composition of the half mat or vellum color may vary, it does not contain any mercurial or other evanescent compound such as has been suggested for use in forming a fugitive coating by way of assisting in the application of gold or color decorations to ware, but the base of such color consists entirely or mainly of one or more metallic oxides which are permanent, as evidenced by the resulting effect in rendering the design visible through or in the gold decoration after firing.

The material forming the base of the composition used in stamping the design on the ware may in fact consist of the metallic oxides employed in glazing, with the addition, as hereinbefore noted, of a small amount of special color to make it easier for the stampers to follow the design. In addition to the gum or equivalent hardening and binding agent, a small amount of pure glycerine may be included to prevent too rapid drying, also a few drops of acetic acid if the color acts greasy for stamping. The glass plate on which such stamping composition is spread out may have a covering of lawn, if desired, to give the effect of a pad whereby a proper thickness of the material is presented to be taken up by the stamp.

While reference has hereinbefore been made to the use of a liquid metal, e. g., liquid gold, for the superimposed coating material, I have found that the various liquid lustres may also be applied over a design stamped in the manner set forth without previously firing the article. In other words, the combined effect of a design and a lustre coating may be obtained with single firing.

Other forms may be employed embodying the features of my invention instead of the one here explained, change being made in the form or construction, provided the elements stated by any of the following claims or the equivalent of such stated elements be employed, whether produced by my preferred method or by others embodying steps equivalent to those stated in the following claims.

I therefore particularly point out and distinctly claim as my invention:—

1. A method of decorating ware having a glazed surface, which comprises forming a design on said surface with a material which is insoluble in the vehicle of a subsequently applied coating material, and coating said design and background, one component of such design material being permanent and another component evanescent upon firing.

2. A method of decorating ware having a glazed surface, which comprises stamping on the surface of the ware with a material which is insoluble in the vehicle of a subse-

quently applied liquid metal coating, an outline of the design and then coating said design with a liquid metal, one component of such design material being permanent and another component evanescent upon firing.

3. In a method of decorating glass or glazed ceramic ware, the steps which consist in imposing on the surface of the ware an outline of the design comprising one or more permanent metallic oxides and a suitable binding and hardening agent, insoluble in the vehicle found in liquid metal, superimposing on such design without previously firing the same a coating of such liquid metal, and then firing.

4. In a method of decorating glass or glazed ceramic ware, the steps which consist in stamping on the surface of the ware an outline of the design consisting of a half mat or vellum color, and a binding and hardening agent insoluble in the vehicle found in liquid metal, superimposing on such design without previously firing the same a coating of such liquid metal, and then firing.

5. A method of decorating ware having a glazed surface, which comprises stamping on the surface of the ware with a material comprising one or more permanent metallic oxides and a water-soluble evanescent gum as a binder for said oxides, an outline of the design and then coating said design with a liquid metal, said oxides and said gum being insoluble in the vehicle of the liquid metal.

6. In a method of decorating glass or glazed ceramic ware, the steps which consist in stamping on the surface of the ware an outline of the design consisting of a half mat or vellum color, a gum soluble in water but insoluble in the vehicle found in liquid gold, sufficient water being included to make a paste, allowing the stamped design to dry, superimposing on such design without previously firing the same a coating of liquid gold, and then firing.

7. In a method of decorating glass or glazed ceramic ware, the steps which consist in stamping on the surface of the ware an outline of the design consisting of a half-mat or vellum color, and a binding and hardening agent insoluble in the vehicle found in liquid metal, allowing such design to set, superimposing on such design without previously firing the same a coating of such liquid metal, and then firing.

Signed by me this 14th day of February, 1927.

WILLIAM N. LEWIS.