

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN ORNAMENTING BAKED EARTHENWARES.

Specification forming part of Letters Patent No. 8,140, dated June 3, 1851.

To all whom it may concern:

Be it known that I, RALPH B. BEECH, of the district of Kensington, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in the Art and Mode of Decorating Earthenware, Stoneware, Delftware, China and Baked Wares generally; and I do hereby declare that the following is a full, true, and exact description of the said improvement.

It is well known that the surface of china and baked wares of all kinds has been for a long time colored and painted with various designs, ornamented by gilding or silvering, and covered with a brilliant and glossy surface.

The several modes hitherto employed for effecting this purpose may be thus briefly described:

First. Drawings and engravings are placed on china by painting or printing them with a metallic oxide in solution on the ware while in the biscuit or unglazed state. A flux or vitreifiable substance in the form of a thin solution is then applied over the entire surface of the ware. The ware is then placed in the glazing-furnace and exposed to the intense heat of the glazing-furnace, which varies from 1,500° to 1,900°, according to the fusible nature of the flux employed. The flux is fused by this heat and forms the glaze or thin coating of glass which covers the outside of most of our chinaware, and at the same time fixes the colors previously painted on the china and develops their brilliancy.

Second. Drawings and paintings in variegated colors upon china and porcelain ware have been also effected by mixing metallic oxide of the various hues desired with some finely-ground fluxing-matters before applying them to the ware. These mixtures are then applied with the brush, making any desired sketches, and the material, when thus painted upon, is exposed to a high heat in an enameling-furnace until the colors are fixed by the fusion of the fluxing-matter. This process is called "painting in enamel-colors."

Thirdly. The surface of china has been ornamented with gilding or silvering by either placing the gold in solution on the surface of the glazed ware and then exposing the ware to the high heat of the furnace until, by the incipient fusion of the glaze, the gold or silver is attached to its surface, or the metals are mixed

in the proper state with some flux and then applied as the enamel coloring was described to be done.

Hitherto no one has ever employed colors mixed with varnish so as to produce, when applied to and combined with baked ware in the biscuit state, a brilliant polished surface of any desired variety of color and without the aid of fluxes or glazing. Neither has any one heretofore applied to this kind of ware gold and silver ornamenting by means of varnishes and cements, or without the aid of fluxes and glazing. No one has heretofore applied to or inlaid upon the surface of china and baked wares in any manner or by any process pearls, shells, or gems for ornamenting such baked-ware surfaces. Neither has earthenware or baked ware of any kind, when in combination and ornamented by a process similar to mine, been employed in the manufacture of such fancy articles as are now usually made of papier-maché, iron, or wood, as desk-tops, table-tops, trays, book-covers, &c.

The first part of my improvement may be distinguished from all previous processes known in this branch of art in this, that in all cases where coloring or gilding by the glazing or enameling process was done upon such wares and a brilliant surface was imparted thereto these results were effected by means of the glazing or enameling process—that is, by the fusion of a flux at a high temperature—while by my improvement these results are obtained by the employment of colors prepared with varnish and applied to the ware in the biscuit state and carefully dried on, and all glazing, fluxes, and exposure to high temperatures are dispensed with.

The advantages resulting from this part of my improvement are, first, that by the absence of the high heat a variety of cheap and beautiful colors may be employed in my process which were too volatile to be used with the high heat of the old process; second, the metallic oxides and other impurities of inferior class will not at the low temperature required by my process affect the coloring-matter employed, whereas in the old process common clays could not be used with fine colors; hence a brilliant and highly-colored surface may by my improvement be given to wares made of the commonest and cheapest clay; thirdly, my process dispenses with the trouble and expense of reheat-

ing and glazing, and gives such a brilliant and variegated surface as could not be obtained by any previous process.

In order to enable others skilled in the art to understand and use my improvement, I will now fully describe the process of coloring and gilding of inlaying pearls, &c., and of polishing the surface of earthen or baked wares.

The earthenware, when in the biscuit state, is to be first fully dried, and the coloring-matter which is to form the body of the surface is mixed with fine copal varnish and applied over the surface of the ware. The ware is then placed for the space of twelve hours in an oven or drying-room heated only to about 180° or 200°. It is next removed and another layer of the same mixture is applied and dried in the same manner, in like manner a thin and fourth layer, and sometimes more. The coloring-matter to form the surface may be varied according to the taste of the artist, and may be either animal, vegetable, or mineral color. A good black surface is obtained from six measures of varnish, mixed with ivory or lamp-black, and one of linseed-oil. For buff, rose, pink, or any of the light delicate colors, the oil of nut-poppy is preferable. Linseed or any of the colored oils damages the light delicate colors by absorption. After the body of the surface is obtained in the manner above described the surface is rubbed down with rotten-stone and water until it becomes perfectly smooth, and is then polished with the hand or fine leather. Any ornamental sketch, figure, or flower may be then drawn on this surface with the brush in ordinary oil-colors mixed with varnish and ground together until perfectly smooth. Gilding or silvering may be done on this surface by penciling with varnish the places where the gold or silver is to be placed, which metals are then applied in the leaf state and dried in the drying oven or room, as above described.

The second part of my improvement consists in attaching pearls, shells, gems, or the like to the external surface of baked ware, either for ornamenting vessels in combination with the above process of coloring or for making an ornamental material out of such wares to be used as a substitute for papier-maché, wood, and iron in making fancy articles, as desk and table tops, trays, &c. Over these substances it possesses the advantage of not being injuriously affected by variations in the temperature and moisture of the atmosphere. The pearls or other materials to be inlaid on the ware are affixed to the ware while in the pure

biscuit state and previously to applying the body or colored surface. I have discovered that the best material for affixing pearls or these other substances is a cement composed of oxide of zinc mixed with fat-oil until it is quite thick and then ground fine. This cement may be tinted of any desired hue, and will then give to the translucent pearl a delicate tint of a similar hue. The cement is to be applied by a brush both to the inner surface of the pearl and the outer surface of the ware. Other cements or varnishes may be employed to affix the pearl; but that, I think, will be found to be the best. After the pearl or other ornamental object is thus fixed the surface of the ware is to receive the successive layers of coloring material and varnish, as described above, to form the body of the surface of the ware, and until this surface is of a uniform thickness with that of the pearl. Any superfluous varnish on the face of the pearl is then scraped off and the whole surface rubbed down and polished with rotten-stone.

When I wish to make ornamental trays, table-tops, or the like, the earthenware is to be molded or turned of the required form and size, and then treated in the manner above described for ornamenting vessels.

Although I apply my process to the earthenwares while in the biscuit state, yet it may be equally well applied to glazed ware; but as the glazing would be superfluous it would generally be omitted.

I do not intend herein to claim the general application of oil-painting to china or earthenware; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The application of coloring-matter mixed with varnish or its equivalent to the surface of baked earthenware for the purpose of giving to such ware a surface of sufficient body and of sufficient brilliancy for ornamental purposes, thus obviating the necessity of the glazing process, substantially as herein described.

2. The inlaying of pearls, gems, &c., on china and baked earthenware for ornamental purposes, substantially as hereinabove described.

3. The peculiar cement and process by which I affix pearls and gems to the china or baked earthenware.

RALPH B. BEECH.

Witnesses:

J. BURCHARD,
GEO. HARDING.