Dec. 27, 1955 J. M. M. BACH 2,728,158

METHOD OF PRODUCING COLORED CHINA CLAY IMAGES

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FIG. 1

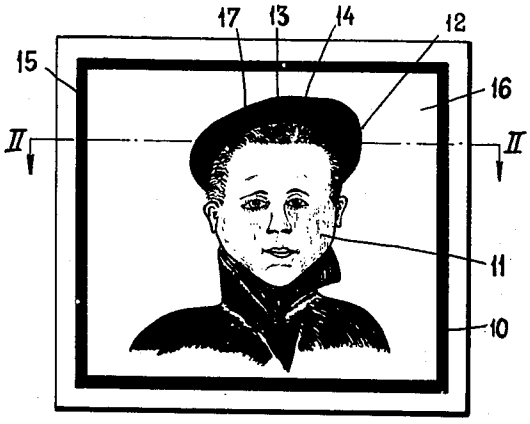
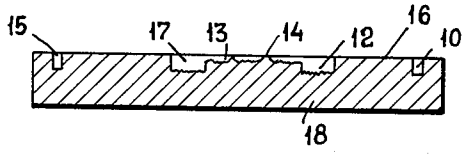


FIG. 2



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METHOD OF PRODUCING COLORED CHINA CLAY IMAGES

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7 Claims. (Cl. 41—26)

The invention relates to a process for the reproduction of a picture, painting or photograph on an article as a tinted relief.

It is an object of the invention to provide for a method of producing articles, having at least at a part of the surface a decoration which is a good low relief reproduction of a picture, a painting or a photograph having the same gradations in tint or in colour as the example.

A further object is the method of producing articles, having at least at a part of the surface a tinted decoration in low relief, which is a good reproduction of a picture, a painting or a photograph in an almost automatic way.

Other objects of the invention will become apparent hereinafter in the specification.

A sheet of gelatine or gelatinous material is photosensitized by the action of a solution of dichromate salts in water, whereafter it is dried in the air. This sheet is pressed against a photographic negative or diapositive of the picture that I want to reproduce, and light is passed through this negative or diapositive on the gelatin sheet. The time of exposure varies in accordance with the intensity of the light and the darkness of the picture; as a rule a time of exposure to sunlight of 1–5 hours is sufficient. Hereafter the sheet is soaked in water, e. g. in water of about 30° C. for 1–6 days. In the water the gelatine swells to an extent, dependent on the intensity of the light to which it has been exposed and on the gelatin surface an exact reproduction in low relief of the picture that has to be reproduced is formed. When dried in the air this low relief picture remains on the gelatin sheet. The difference in height of the different parts of the low relief varies with the time of exposure and the soaking time. In order that I may perform in the right way the tinting or coloring process as described hereinafter, the difference in height of the embossed parts and the recesses has to be at least ¾ mm. and preferably 3–5 mm.

This gelatin sheet can be used as such as a mould but I prefer to harden it before using it for this purpose by the action of a hardening agent as e. g. a solution of formaldehyde in water. It may be used as a casting mould for substances like gypsum, cement, concrete and other substances, hardening at low temperatures.

When a casting with a curved surface e. g. a spherical form is wanted, I fix a sensitized and exposed gelatin sheet on a surface of the desired form and soak and dry it in this state.

When castings or mouldings of substances as e. g. resins, metals or plastics are wanted, these cannot be pressed or cast in a gelatin mould. For these purposes I prepare a gelatin low relief and make by pressing it into casting sand a casting mould in which a metal is cast. This metal object can be used as a mould for pressing the desired articles.

All the articles made in this or a similar way have on the surface in low relief a good reproduction of the picture, painting or photograph, the depth of the recesses of this relief corresponding exactly with the grade of tint or colour of the example.

The invention consists in the method of tinting or coloring these low relief pictures to exact reproductions of the example and in the articles, having tinted or colored reproductions made by this tinting or coloring process.

According to the invention this coloring process is performed by bringing into the recesses of a low relief picture on the surface a locally varying little quantity of a tinting or a coloring matter, this quantity locally corresponding with the depth of the recesses and therefore providing herein a grade of tint or colour corresponding with the gradations in tint or colour of the example, providing a tinted or colored low relief reproduction of the example.

One way of carrying out this process is by suffusing the low relief picture with a thin layer of a slow settling diluted suspension of a tinting or coloring agent in a suspending liquid, settling of said tinting or coloring agent in a quantity locally varying in correspondence with the thickness of the layer of suspension on the surface and therefore varying also with the depth of the recesses, removing the suspending liquid after that said tinting or coloring agent is substantially settled.

To obtain good results the concentration of the tinting or coloring agents in the suspension must not be more than 6 percent by weight, and preferably between 1 and 2 percent. When greater concentrations are used the gradations of the reproduction differ from the gradations of the example.

Further the surface of the low relief has to be wetted evenly by the suspension. When the article is of a type difficultly moistened by the suspending agent, as e. g. metal by water, a surface active agent, as e. g. carboxymethyl-cellulose, must be added to the suspending liquid. When the article is of a porous character, as e. g. an unglazed ceramic body, this body has to be wetted with the suspending liquid before suffusing the suspension on it in order to prevent sucking of the suspension into the body.

In order to control the settling time of the suspension I may add to the suspension a protective colloid.

If it is wanted to increase the settling time I can do this also by increasing the viscosity of the suspending liquid by addition of a substance which increases the viscosity of this liquid, as e. g. addition of sugar, when this liquid is water. When the whole surface of the low relief is suffused at a time, a tinted picture is obtained.

It is, however, possible to apply the process successively with suspensions of different dyes on different parts of the low relief for the production of pictures in different colours.

When objects as a vase or a can or jar must be provided with tinted or colored low relief pictures at all sides the process as described hereinbefore is taking up much time. On suffusing and settling of the suspension the low relief must be substantially horizontal. Therefore from a round shaped article only a little part of the surface can be colored at a time. In this case the tinting or coloring matter is applied as a dry powder on the moist surface of the matrix or mould before casting or moulding the article. By blowing the tinting matter as a dust over the wet surface of a mould with a low relief this dust adheres nearly only on the elevations, and no coloring matter is deposited in the recesses.

I can also apply the colour powder on the surface of a matrix with a low relief so that the quantity varies according to the height of the elevations by tapping all over the wetted surface of the low relief with a linen bag filled up with the colour powder.

If after coloring of the matrix a casting is made in this matrix, e. g. a casting of clay in a matrix of gypsum, the powder is transferred to the surface of the casting without mixing substantially with the casting substance, and

after solidification a casting with a good tinted low relief reproduction of the example is obtained.

In the accompanying drawing:

Fig. 1 is a top plan view of a china tile with a tinted low relief reproduction of a photograph of a boy;

Fig. 2 is a transverse vertical sectional view thereof on line II—II of Fig. 1.

The body 18 is of white burnt china clay. On the surface is a good relief picture of e. g. a boy's portrait. The dark parts of the bonnet and the surrounding rim have deep recesses indicated with 10, 12, 17 and 15. The hair of the boy forms recesses of lower depth indicated with 13; the parting 14 has almost the same height as the uncolored part of the tile 16.

This tile is soaked with water and suffused with a suspension of 1 percent of cobaltoxide in a 10 percent solution of sugar in water, by weight, so that the recesses are completely filled with it. After some minutes the cobaltoxide is settled down, and the sugar solution poured off. Hereafter the surface of the tile is sprinkled with a glaze powder melting to a translucent glaze, and the tile is burnt. The result is indicated in Figure 1.

A good result is also obtained when from a dried casting of china clay, which is not burnt, the low relief picture is suffused with a suspension of a ceramic coloring agent as cobaltoxide, manganese oxide, ferric oxide etc., and afterwards the colored casting is burnt.

The process is applicable in the same way on low relief pictures of metal castings, of chocolate, of soap, of resin, of rubber etc.

What I claim is:

1. In a process of producing colored china clay images, the steps of depositing on a substantially horizontal surface of a cast china clay body an aqueous suspension of a water-insoluble metal compound not absorbable by said china clay body and which on burning forms a colored compound with china clay in an amount sufficient to cover said surface of said cast body and containing a maximum of 6% by weight of said metal compound and also containing sugar as a viscosity increasing additive, said surface having depressions of varying depth; allowing said metal compound in the thus applied suspension to settle in the said depressions in said surface of said cast body, thereby forming a coating of said metal compound on said surface the thickness of which varies in direct proportion to the depth of said depressions; removing the supernatant liquid from said surface; and burning said cast china clay body thereby combining said metal compound with the china clay and forming a colored china clay image.

2. In a process of producing colored china clay images, the steps of depositing on a substantially horizontal surface of a cast china clay body an aqueous suspension of a water-insoluble metal compound selected from the group consisting of oxides of cobalt, manganese and iron in an amount sufficient to cover said surface of said cast body and containing a maximum of 6% by weight of said metal compound and also containing sugar as a viscosity increasing additive, said surface having depressions of varying depth; allowing said metal compound in the thus applied suspension to settle in the said depressions in said surface of said cast body, thereby forming a coating of said metal compound on said surface the thickness of which varies in direct proportion to the depth of said depressions; removing the supernatant liquid from said surface; and burning said cast china clay body thereby combining said metal compound with the china clay and forming a colored china clay image.

3. In a process of producing colored china clay images, the steps of depositing on a substantially horizontal surface of a cast china clay body an aqueous suspension of cobalt oxide which is not absorbable by said china clay body and which on burning forms a colored compound with china clay in an amount sufficient to cover said surface of said cast body and containing a maximum of 6% by weight of said cobalt oxide and also containing sugar as a viscosity increasing additive, said surface having depressions of varying depth; allowing said cobalt oxide in the thus applied suspension to settle in the said depressions in said surface of said cast body, thereby forming a coating of said cobalt oxide on said surface the thickness of which varies in direct proportion to the depth of said depressions; removing the supernatant liquid from said surface; and burning said cast china clay body thereby combining said cobalt oxide with the china clay and forming a colored china clay image.

4. In a process of producing colored china clay images, the steps of depositing on a substantially horizontal surface of a cast china clay body an aqueous suspension of a water-insoluble metal compound selected from the group consisting of oxides of cobalt, manganese and iron and containing a surface active agent in an amount sufficient to cover said surface of said cast body and containing a maximum of 6% by weight of said metal compound and also containing sugar as a viscosity increasing additive, said surface having depressions of varying depth; allowing said metal compound in the thus applied suspension to settle in the said depressions in said surface of said cast body, thereby forming a coating of said metal compound on said surface the thickness of which varies in direct proportion to the depth of said depressions; removing the supernatant liquid from said surface; and burning said cast china clay body thereby combining said metal compound with the china clay and forming a colored china clay image.

5. In a process of producing colored china clay images, the steps of depositing on a substantially horizontal surface of a cast china clay body an aqueous suspension of a water-insoluble metal compound selected from the group consisting of cobalt, manganese and iron in an amount sufficient to cover said surface of said cast body and containing a maximum of 6% by weight of said metal compound and also containing sugar as a viscosity increasing additive, said surface having depressions of varying depth; allowing said metal compound in the thus applied suspension to settle in the said depressions in said surface of said cast body, thereby forming a coating of said metal compound on said surface the thickness of which varies in direct proportion to the depth of said depressions; removing the supernatant liquid from said surface; and burning said cast china clay thereby combining said metal compound with the china clay and forming a colored china clay image.

6. In a process of producing colored china clay images, the steps of wetting the surface of a cast china clay body with water; depositing on a substantially horizontal surface of the thus wetted surface of said cast china clay body an aqueous suspension of a water-insoluble metal compound not absorbable by said china clay body and which on burning forms a colored compound with china clay in an amount sufficient to cover said surface of said cast body and containing a maximum of 6% by weight of said metal compound and also containing sugar as a viscosity increasing additive, said surface having depressions of varying depth; allowing said metal compound in the thus applied suspension to settle in the said depressions in said surface of said cast body, thereby forming a coating of said metal compound on said surface the thickness of which varies in direct proportion to the depth of said depressions; removing the supernatant liquid from said surface; and burning said cast china clay body thereby combining said metal compound with the china clay and forming a colored china clay image.

7. In a process of producing colored china clay images, the steps of wetting the surface of a cast china clay body with water; depositing on a substantially horizontal surface of the thus wetted surface of said cast china clay body an aqueous suspension of a water-insoluble metal compound selected from the group consisting of oxides of cobalt, manganese and iron in an amount sufficient to cover said surface of said cast body and containing a

maximum of 6% by weight of said metal compound and also containing sugar as a viscosity increasing additive, said surface having depressions of varying depth; allowing said metal compound in the thus applied suspension to settle in the said depressions in said surface of said cast body, thereby forming a coating of said metal compound on said surface the thickness of which varies in direct proportion to the depth of said depressions; removing the supernatant liquid from said surface; and burning said cast china clay body thereby combining said metal compound with the china clay and forming a colored china clay image.

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