United States Patent

Beverick et al.

[15] **3,659,327**

[45] **May 2, 1972**

[54] METHOD OF MAKING CAST PICTORIAL REPRODUCTION

[72] Inventors: **James J. Beverick,** 1202 North 5th Street, Sandusky, Ohio 44870; **David P. Winters,** 1300 1/2 Croghan Street, Fremont, Ohio 43420

[22] Filed: **Mar. 13, 1970**

[21] Appl. No.: **19,475**

[52] **U.S. Cl.** **29/160.6,** 63/23, 161/7

[51] **Int. Cl.** **B21f 43/00,** B23p 13/00

[58] **Field of Search** 29/160.6, 527.1, 527.5; 161/7, 161/19, 32; 63/3, 15, 2, 20, 23

[56] **References Cited**

UNITED STATES PATENTS

2,003,376	6/1935	Lesmeister	63/15
2,145,071	1/1939	Cave	63/2
2,118,468	5/1938	Jungersen	29/160.6 X
3,094,375	6/1963	Halford	161/7 X

FOREIGN PATENTS OR APPLICATIONS

294,396	9/1954	Australia	161/7

Primary Examiner—John F. Campbell
Assistant Examiner—Victor A. DiPalma
Attorney—Richard C. Darr

[57] **ABSTRACT**

A reproduction in castable material of a photo or other form of picture and a method of producing the cast picture. A photo or other desired form of scene is reproduced as a black and white negative with shading eliminated, and the negative is processed to produce a likeness thereof in the castable material with the dark lines standing in relief and the light areas recessed. The recessed areas are filled with powdered enamel to a level somewhat below the top of the relief features, and the object is baked to fuse the enamel and bond it to the casting.

7 Claims, No Drawings

METHOD OF MAKING CAST PICTORIAL REPRODUCTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention pertains broadly to cast pictures, and is more particularly concerned with production of a cast article bearing a true reproduction of a desired picture or scene.

2. Description of the Prior Art

Jewelry items such as charms, medallions, rings and medals depicting various scenes or figures have heretofore been produced in many forms and sizes. The charms, medallions and medals may be worn on so-called charm bracelets, suspended by chains around the neck, or attached to the clothing of the wearer, while the rings are generally worn on the fingers, but may also be suspended by chains. The desired design is created by the outline of the article or by a raised or recessed are on the surface thereof. Such articles could heretofore generally only be produced economically by mass methods with a standard design, so that the purchaser was not able to obtain an article of jewelry of this type exhibiting a personalized scene or figure, except by incorporating an actual photograph beneath a transparent covering as illustrated in U.S. Pat. No. 2,145,071, issued Jan. 24, 1939 to H.G. Cave.

SUMMARY OF THE INVENTION

In accordance with the present invention, an attractive pictorial likeness of any desired subject is reproduced in an article of jewelry. The likeness is duplicated in a metal casting wherein the outstanding lines of the object are provided by areas of the casting standing in relief, and the background is provided by fused enamel. Thus, the article is individualized, extremely attractive, and permanent, while still being relatively inexpensive.

It is, therefore, a primary object of the invention to provide an article of jewelry having reproduced thereon a true likeness of a desired subject.

Another object of the invention is to produce such an article which is of extremely high quality and very durable.

Still another object is to provide a method of producing such articles on an individualized basis so that any image may be economically reproduced thereon.

Other objects will become apparent from the following description and claims.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

While the invention will be described herein with particular regard to small charms such as those carried on so-called "charm bracelets", for which it is particularly well suited, it will be understood that the inventive principle is applicable as well to many other articles such as decorative pictures or plaques.

As pointed out above, the likeness of any individual or group or any other subject may be reproduced in the casting in accordance with the invention. It is unnecessary that the subject be physically present since the casting is produced from a picture of the subject. Any type of picture which clearly delineates the subject is suitable for duplication. Thus, for example, the picture may be in the form of a painting, sketch or drawing, or a photograph, either black and white or in color.

The first step in the process is to produce a black and white negative of the picture with shading and background coloring eliminated, leaving a stark black-on-white likeness of the original picture. The negative may be obtained by rephotographing the original picture with a large camera by conventional photographic processes well known to those skilled in the art or, more simply, by tracing the outstanding lines of the original on a white background. At this point the negative may be retouched as necessary to achieve the desired effect.

An exact likeness of the negative is next produced on a zinc plate by photo-engraving as is employed in offset printing techniques. By this process the background or light areas of the negative are recessed into the plate a distance on the order of one millimeter, with the dark lines representing the outstanding lines of the subject standing in relief above the recessed portions by the same amount. In the event the picture being reproduced is that of a person, these lines will represent the outstanding lines of face, hair, clothing, etc. Of course, in producing the plate the image may be enlarged or reduced in size as desired for the final product. As will be apparent hereinafter, the plate must be reversed right to left in order for the finished product to be correctly oriented.

This plate, which is a metal copy of the picture, is then reproduced in the material which is to comprise the final article. Thus, an impression of the metal plate is taken with a conventional impression material such as a rubber base compound containing a silicone, producing in the impression material a reverse of the plate and original picture. Such impressions are commonly employed in the dental profession in the production of gold bridgework. The impression is then filled with wax which forms an exact likeness of the finished casting. This wax likeness may, if necessary, be carved to correct defects or introduce such changes as are desired.

The wax likeness is invested into a casting ring filled with high heat plaster. When the plaster has set, the ring is placed in a furnace and heated to a temperature on the order of 1000° F. for a period of about one hour. Of course, the temperature of the furnace and the time during which the ring remains therein will depend upon the particular materials and the size of the article being produced. Within the furnace, the wax likeness burns out, that is, melts and runs out, leaving a plaster mold into which the material of which the final article is to be comprised is cast.

Articles such as charms, medals and rings produced in accordance with the invention are generally formed of precious metals such as gold, silver, platinum or alloys of these precious metals. However, as will be hereinafter apparent, other materials such as brass which can be suitably cast may also be employed. To this end, the plaster mold is placed in a centrifugal casting machine, and the molten material is supplied thereto in a conventional manner. When the casting has cooled sufficiently, it is removed from the ring of plaster and polished to remove blemishes. There is thus produced in the desired material an exact likeness of the subject in the aforementioned zinc plate.

The recessed portions of the finished casting are then filled with a suitable fuseable material, such as powdered enamel, to a level slightly below the top of the outstanding lines standing in relief thereabove, and the casting is placed in an oven. Other fuseable materials, such as certain ceramics, may be employed as will be appreciated by those skilled in the art. Where powdered enamel is employed the casting should be baked at a temperature from about 1,380° to 1,650° F. for a period of about 1 hour. Upon baking of the casting, this material fuses to become a hard glassy substance adhering tightly to the casting, and the exposed portions of the casting, that is, the lines standing in relief and the background area around the likeness of the original picture, turn dark due to oxidation of the cast material. Consequently, the lines standing in relief appear as dark lines with a light enamel background. The casting is then polished around the edges and any highlight areas to remove the oxide from these areas, producing the finished product.

It will be appreciated that while such articles are generally made of alloys of gold, platinum or silver, the colors of the final casting, lines standing in relief, and fused background can be modified in various ways to produce practically any combination of colors. Thus, different materials may be employed in the casting to achieve various colors. Likewise, the enamel or other fuseable material can be tinted to give a desired background coloring, and the atmosphere of the oven can be regulated to control the oxidation of the surface of the casting. By maintaining an inert or a slightly reducing atmosphere therein, oxidation can be prevented so that the entire cast portion of the article will have the color of the casting material without the necessity of polishing.

There is thus produced an article of extremely high quality and durability having reproduced thereon a personalized image or picture, with the outstanding lines in one color against a background of a different color. The casting in which the picture is incorporated can have an overall configuration such that the article can be utilized separately as a charm or medal, or it can have a configuration adapted to be affixed to a ring or other article of jewelry.

EXAMPLE

An extremely attractive charm bearing the likeness of one of the inventors was produced in accordance with the invention. From a photograph of the subject, an exact black-on-white reproduction was produced by tracing the outstanding lines of the photograph in black ink on white paper. A right-to-left reverse negative of the drawing was made, and a zinc plate was then made from the negative by photo-engraving. An impression of the zinc plate was taken with a silicone and rubber base impression material. Molten wax was flowed into the impression and allowed to harden. The wax was then removed from the impression and invested in plaster. The investment was allowed to stand for an hour for the plaster to set, and the casting ring was then placed in a pre-heated furnace at 1,000° F. for a period of 1 hour to allow the wax to burn out.

After the wax had burned out, the ring with the investment was placed in a broken-arm, spring activated centrifugal casting machine. The crucible of the casting machine was provided with an 18 carat gold alloy comprising about 75 percent fine gold, 15 ½ percent copper, and 9 ½ percent silver, having a melting point of approximately 1,700° F. When the gold alloy was molten, the set pin on the casting machine was released and the molten alloy was centrifugally cast into the ring.

When the casting had cooled to room temperature, the investment was removed therefrom and the casting was pickled in a solution of nitric acid and water. The sprues were removed and the casting was finished to a high polish. A fine grain enamel comprised of glass and silica with metal oxides added for coloring, was then applied to the recessed areas of the casting, and the casting was placed in a kiln and fired at a temperature of about 1,500° F. for an hour. After the casting with the fused enamel was removed from the kiln and cooled to room temperature, the background area was again polished to a high lustre, completing the charm.

It is to be understood that the forms of the invention herewith described are to be taken as illustrative embodiments only of the same, and that various procedural changes may be resorted to without departing from the spirit of the invention.

We claim:

1. A method of producing an article of jewlery having a pictorial reproduction thereon, comprising the steps of producing a negative of the picture to be reproduced on said article with shading eliminated therefrom, producing a photoengraved plate of said negative having the light areas thereof recessed and the dark lines standing in relief, taking an impression of said plate, filling said impression with wax to form a wax likeness thereof, investing the wax likeness into a casting ring filled with plaster and allowing the plaster to set, heating the plaster to burn out said wax likeness and leave a plaster mold, introducing molten material from which said article is to be formed into said plaster mold, removing the resulting casting from said mold after it has solidified, filling the recessed portion of said casting with a fuseable material to a level below the tops of said lines standing in relief, and heating the casting to fuse said fuseable material.

2. A method of casting an article of jewlery having a pictorial reproduction thereon as claimed in claim 1, in which said molten material from which said article is to be formed includes a metal chosen from the group consisting of gold, silver, platinum and brass.

3. A method of casting an article of jewelry having a pictorial reproduction thereon as claimed in claim 7, in which said impression is taken with a silicone and rubber base material.

4. A method of casting an article of jewelry having a pictorial reproduction thereon as claimed in claim 1, in which said set plaster is placed in a preheated furnace and maintained at a temperature of about 1,000° F. for a period of about one hour to burn out said wax likeness.

5. A method of casting an article of jewelry having a pictorial reproduction thereon as claimed in claim 1, in which said fuseable material with which said recessed portion is filled comprises a powdered enamel including glass, silica, and a metal oxide coloring agent.

6. A method of casting an article of jewelry having a pictorial reproduction thereon as claimed in claim 5, in which said casting is heated to a temperature in the range from about 1,380° to 1,650° F. to fuse said powdered enamel.

7. A method of casting an article of jewelry having a pictorial reproduction thereon as claimed in claim 6, including the step of polishing said casting around said recessed portion following heating thereof to fuse said powdered enamel.

* * * * *

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,659,327 Dated May 2, 1972

Inventor(s) James J. Beverick et al

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 1, line 18, cancel "are" and insert --area--

Claim 3, line 2, cancel "7" and insert --1--

Signed and sealed this 29th day of August 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents