

UNITED STATES PATENT OFFICE.

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PRODUCING ENAMELED IRON WARE.

SPECIFICATION forming part of Letters Patent No. 488,683, dated December 27, 1892.

Application filed June 27, 1891. Serial No. 397,740. (No specimens.)

To all whom it may concern:

Be it known that I, CARL A. W. VOLLRATH, a citizen of the United States, residing at Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented a new and useful Improvement in the Method of Producing Enameled Iron Ware, of which the following is a specification.

My invention relates to an improvement in the process of making enameled iron-ware of the kind known as speckled or peppered-ware. The characteristic of the ware answering the above description is the presence throughout the enamel, and preferably as a constituent part thereof, of specks contrasting in color with the remainder of the enamel. The ware is distinguished from what is known as mottled ware, such as granite or agate ware, in the fact that the contrasting specks are produced by the incorporation in the enamel coating of an agent which presents the contrasting color, whereas in the case of the mottled ware the specks or spots are not only generally of a larger and somewhat less defined character than those found in the speckled-ware, but are caused by the absorption into the glaze of oxide of iron formed upon the surface of the metal during the process of enameling.

The particular product to which my invention relates is very fully described in my pending application for Letters Patent, Serial No. 342,883, filed March 6, 1890, and a process fully capable, under proper manipulation, of making ware presenting the general characteristics above described, is set forth in Letters Patent No. 415,485, granted to me November 19, 1889. I have found, however, that in order to obtain the best results in the matter of size and regularity of the spots and finish in the enamel, an improvement is possible in the composition of the enamel, not only as the same is set forth in my Letters Patent, above mentioned, but also that described in connection with my application for Letters Patent on the article of manufacture, now pending. I have found that to produce a perfect uniformity in the character of the enamel coating, the best result is obtained by making the contrastingly colored enamel, or that which produces the speck, of ingredients offering readier fusibility than those constitut-

ing the paste into which the contrasting enamel is introduced.

My invention, therefore, consists, broadly, in a process of making speckled enameled ware, which consists in preparing a paste from the desired ingredients and adding thereto a granular enamel, ground to a proper degree of fineness and having a fusibility greater than that of paste, and thereupon applying the mixture to the article, and drying and fusing in the usual manner.

My invention consists further in the preferred composition which I employ for the best results.

I use the process with equal success in enameling wrought or cast-iron, but where cast-iron is enameled it is desirable to provide a ground coating, which is ordinarily unnecessary with wrought-iron. This ground mass may consist of the following ingredients; fifty (50) parts of flint or quartz sand, thirty to sixty (30-60) parts of borax, and five (5) to ten (10) parts of lime. These are melted together, ground with water into a paste and the paste is distributed over the article in the usual manner; the article is then dried and introduced into a muffle, where the glaze is fused at the ordinary temperature, about 1000° to 1200° Fahrenheit. Previous to the application of the enamel paste to the iron, whether wrought or cast, the usual scouring is performed, for the well known purpose.

The surface coating, or that which affords the ornamental, speckled appearance to the ware, is made in the following manner; a mixture of the following ingredients is produced, viz., feldspar, sixty parts; borax, thirty to thirty-five parts; cryolite, thirty parts; soda, ten to fifteen parts; saltpeter, five parts. This mixture is melted in a crucible and then thoroughly ground with water, clay being added if desirable, until it assumes the consistency of cream. Into the paste thus formed is introduced a separate mixture of the same ingredients in about the same proportion, except for the addition of about fifteen parts of borax to that already employed, and with the further addition of the coloring ingredient, such as any of the coloring oxides—cobalt, for blue, manganese, for brown, &c.,—in such proportion as may be necessary to get the tint or density of color desired in the specks; and

this mixture is melted, cooled and ground, in the dry state, to a granular form of greater or less fineness, according to the size of the specks ultimately desired. The presence of
 5 the additional quantity of borax in the granular mass makes it more readily fusible than the mass prepared in the form of a paste; hence, when the two masses are combined and applied to the iron, dried and fused, notwithstanding that the second enamel is coarser in
 10 its nature than that to which it is added, a substantial uniformity in fusing is presented which affords in the finished product a perfectly smooth and even surface of enamel containing sharply contrasting specks in its body.

Instead of borax other agents may be added to the mixture for the purpose of rendering the granular mass more easily fusible, such as any other fluxing agent; or the reverse operation may be performed, viz., to render the
 20 pasty mass less readily fusible in its character. This may be done, among other ways, by increasing the proportion of feldspar, or by adding about ten parts of boneash, or by combining these proceedings, or by adding similar
 25 agents, but I intend by my claims to cover either of these methods of effecting the result desired, and while I prefer the formula first given, viz., that involving the addition of
 30 borax in greater quantity to the granular mixture, I do not confine my invention thereto. If it be desired that the specks shall have an especially minute dimension, the quantity of added borax, or other ingredient for increasing
 35 fusibility, may be reduced nearly, or quite, to the proportion provided in the paste; on the other hand, if a much coarser spot is desired the proportion of borax, or other similar ingredients, may be increased.

40 While I have described the mixing of the granular and pasty mixtures before applying to the iron, I have obtained good results by

applying the paste first to the iron by dipping or floating, and thereupon sifting upon it the granular mixture of contrasting color, then
 45 drying and fusing. The advantage of this procedure is found in the possibility of varying the style or ornamentation, but it is a slower process than the other.

What I claim as new and desire to secure
 50 by Letters Patent is;

1. The process of producing speckled enameled iron-ware, which consists in mixing two enamels having different fusibility and ground to different degrees of coarseness, applying them to the article, drying and fusing,
 55 substantially as described.

2. The process of producing speckled enameled iron-ware, which consists in first preparing the enamel paste, adding thereto a
 60 granular enamel of contrasting color and fusible more readily than the enamel paste, applying the mixture to the article, drying and fusing, substantially as described.

3. The process of producing speckled cast-
 65 iron ware which consists in coating the iron with an enamel and drying and fusing the same, thereupon coating the surface thus produced with a mixture of two enamels, one of which is ground more coarsely and made more
 70 readily fusible than the other, and again drying and fusing, substantially as described.

4. A composition for producing speckled enameled iron ware comprising two mixtures,
 75 one composed of feldspar, borax, cryolite, soda and saltpeter, and the other composed of substantially the same ingredients with an additional proportion of borax, said mixtures being combined as and for the purpose set forth.

CARL A. W. VOLLRATH.

In presence of—

JOHN R. RIESS,
 FELIX BENFEY.