Aug. 11, 1942. C. T. GORDON 2,292,368

VITREOUS ENAMEL BATH FLOOR

Filed Oct. 19, 1939

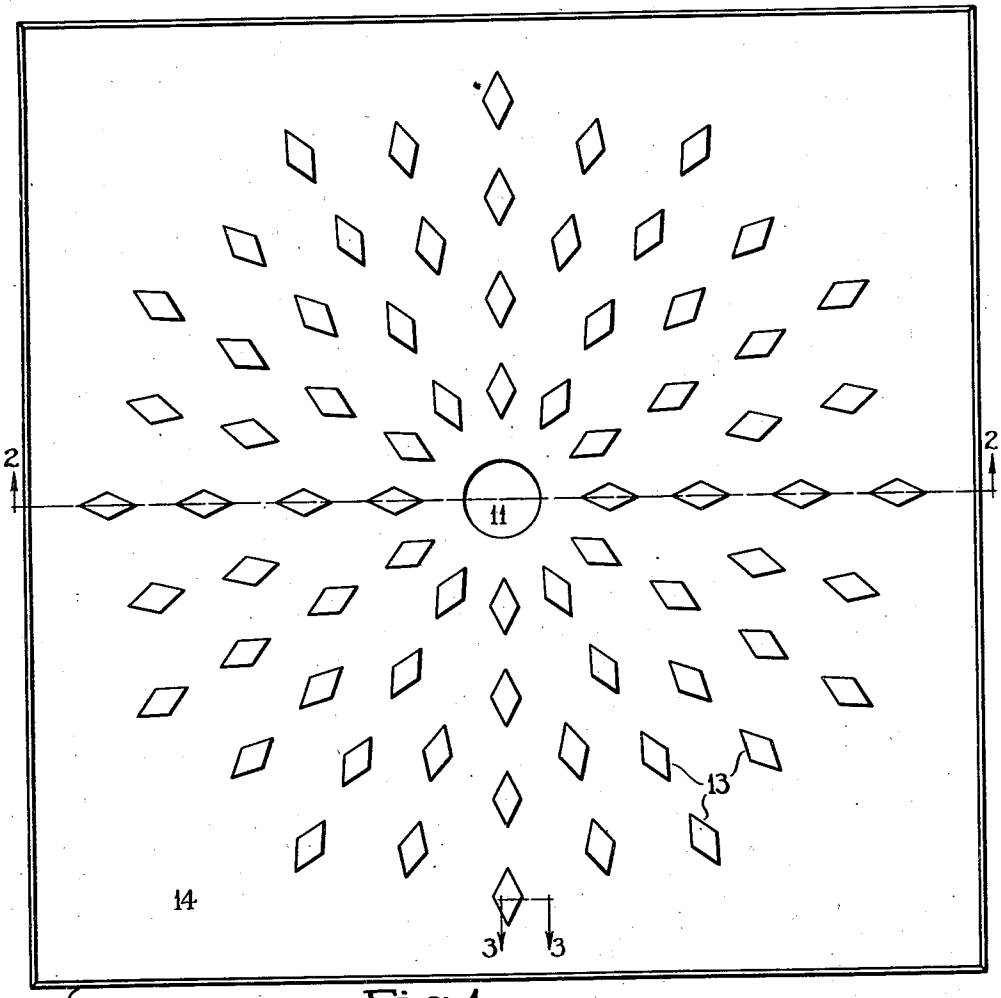


Fig. 1.

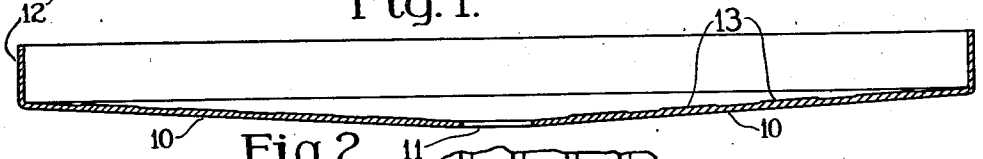


Fig. 2.

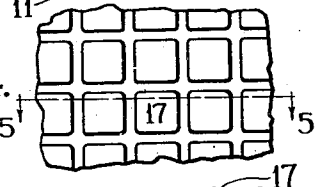


Fig. 4.

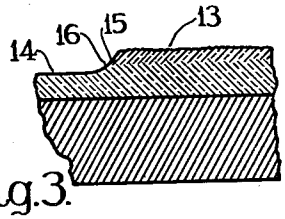


Fig. 3.

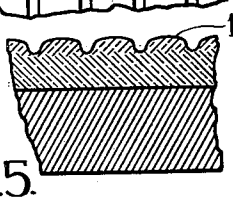


Fig. 5.

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VITREOUS ENAMEL BATH FLOOR

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3 Claims. (Cl. 4—146)

This invention relates to improvements in "safety" or "non-slip" floors for bathing appliances, and has particular reference to floors having a vitreous-enamel surface.

One object of this invention is to provide a "safety" floor for such appliances known as shower-bath cabinets.

Another object of this invention is to provide a glazed, vitreous-enamel floor-surface with a plurality of spots having a dull, matte, granular or similar surface that has traction, even when wet.

A further object of this invention concerns the elevation of the traction spots, relative to the glazed surface of the floor, so as to retain adequate traction for the feet of the user without increasing the relative roughness of the tractions spots, and yet reduce to a practical minimum the area of traction surface relative to the area of the glazed surface.

A still further object of this invention concerns the arrangement of the said elevated traction-spots relative to the drain, so that the glazed portions of the floor surface provide drainage channels communicating directly with the said drain, thereby reducing to a minimum, harbors for germs, spores, waste matter, etc., and thus provide a floor surface having improved sanitation characteristics.

Another object of this invention concerns the method of producing such a floor surface from a combination of frits, or vitreous-enamels, each having individual characteristics as to physical properties.

These and other objects of my invention will become more apparent as the following description is read in connection with the accompanying drawing in which:

Figure 1 is a plan view of a receptor for a shower-bath cabinet;

Figure 2 is a sectional view taken along lines 2—2 of Figure 1;

Figure 3 is an enlarged sectional view taken along lines 3—3 of Figure 1, and illustrates the junction of the elevated traction-spots 13 with the glazed vitreous-enamel surface 14;

Figure 4 is a partial plan view of the floor of a receptor having a modified non-slip surface, in which the elevated traction-spots have a texture relatively smoother than that of Figure 1; and

Figure 5 is a partial sectional view taken along lines 5—5 of Figure 4.

Shower-bath cabinets, to which the present invention has particular application, have gained quite extensive use. Accordingly, the slipperiness of the vitreous-enamel surface of the floor has become an important consideration. Heretofore, the entire surface of the floor has been made rough, somewhat like the surface of sandpaper, by sprinkling dry sand into the wet frit applied for the finish coat. However, by reason of this depositing of the sand into the wet frit, considerable care was required to avoid a glazing-over of the sand when firing the frit. Further, because of the overall relative coarseness of the floor surface, it was difficult to maintain clean and sanitary. Thus, it is the purpose of this invention to overcome these, and other difficulties, and to provide a receptor having not only improved operating characteristics, but low cost of manufacture.

In the following description, the expression "traction-spot" is employed to designate the relatively small areas on the surface of the floor that have a dull, matte or granular surface, which areas provide the required traction, or "non-slip" characteristics for the glazed surface of the floor.

In the drawing, the numeral 10 designates the floor of a receptor for a shower-bath cabinet, which floor has a perimetrical flange 12 projecting vertically therefrom. As illustrated in Figure 2, the floor 10 is depressed, and has a central aperture 11, which aperture provides a suitable drain outlet for waste laden water.

In Figure 1, the numeral 14 designates a glazed, vitreous-enamel surface, which surface completely covers the floor of the receptor, except as interrupted by elevated traction-spots 13. In the preferred embodiment of this invention, the traction-spots 13 are illustrated as having a diamond shape, and are arranged in rows extending radially, outwardly from the central drain 11.

Each of the diamond-shaped traction-spots 13 are elevated relative to the glazed, vitreous-enamel surface 14, and are so constructed and arranged that waste laden water will drain rapidly therefrom onto the said glazed, vitreous-enamel surface 14. Therefore, it will be apparent that the radial arrangement of the rows of traction-spots 13 provides a plurality of drainage channels communicating directly with the central drain 11, which channels have a glazed, vitreous-enamel surface that will rapidly convey water laden with waste matter to the central drain 11.

While Figure 1 illustrates the traction-spots as diamond-shaped figures arranged in radial rows, it must be understood that the traction-spots can have other shapes and sizes, and that

such traction-spots can be arranged according to various other pattern arrangements without departing from the spirit of this invention.

It is also emphasized that although the invention is illustrated in connection with a receptor for a shower-bath cabinet, the teachings of the invention are applicable to floors of other bathing appliances such as conventional bath tubs, etc.

Thus the floor of bathing appliances constructed in accordance with the foregoing are made advantageously slip-proof by uniformly distributing traction-spots over the glazed surface thereof, which traction-spots are permanently anchored in the enamel of the glazed surface. Accordingly, such floors are permanent, adequately slip-proof, and relatively easy to maintain clean.

To produce the non-slip floor-surface, the invention contemplates using two enamel frits, one of which has a maturing temperature higher than the other. The frit having the lower maturing temperature is first applied to the surface of the floor, and then the frit having the higher maturing temperature is deposited on top of the first frit in the form of the desired pattern. Both frits are then fired at the temperature required to mature the first frit, which temperature is less than that required to mature the second. Thus, the first frit is completely matured and has a highly glazed surface, while the second frit is not matured and has a uniform dull or matte finish.

If desired, the firing temperature may be slightly above the maturing temperature of the first frit, but less than the maturing temperature of the second fruit, under which condition the frits are fired for a time sufficient to completely mature the first first into a highly glazed surface, and stopped before the second frit matures or settles appreciably into the molten body of the first frit.

From the foregoing it will be apparent that by separately applying the two frits, the unmatured second frit will remain elevated relative to the matured first frit. Accordingly, since the matured first frit provides a highly glazed surface, while the unmatured second fruit provides a dull or matte surface, the dull or matte surfaces will remain elevated relative to the glazed surface.

It has been found that the frits may be more conveniently applied by the wet process. Under this arrangement, the first frit, which matures into a glazed surface is applied by dipping or spraying and then at least partially dried. The second frit is then applied over the first frit in the desired pattern by spraying through a suitable stencil. The receptor thus coated is then dried in advance of firing.

During final firing, the first frit liquifies into a complete viscous state, and settles into a stratum somewhat reduced in thickness. Concurrently the second frit partially liquifies. At this stage of the firing process, the flux of both frits liquify and amalgamate along the mutual margins designated by numeral **15**, in Figure 3. It has been observed that the excess silica, or the like, of the second frit inhibits a portion of the viscous matter of both frits, when the final firing temperature is definitely lower than the temperature required to completely mature the second frit. This action is probably due to surface tension and cohesive force. Although the flux of the second frit liquifies, the higher melting point of the silica, and the difference between the coefficient of expansion of the two frits, operate to prevent the second frit from being completely amalgamated. Thus, the fired frits, although settled somewhat, mature into respectively glazed and matte surfaces, with the matte surface remaining elevated relative to the glazed surface.

In Figure 3, the numeral **16** designates a fillet, which fillet forms adjacent the junction of the surfaces of both frits during firing. At this stage of the firing process, firing is complete, and the receptor is removed from the furnace, while the second frit yet retains its dull or matte surface and remains in its relative elevated position.

Although the frits have been described as being fired simultaneously, it is also possible to apply, dry and fire the first frit before applying the second frit. Under this arrangement, firing for the second frit is carried out in the manner outlined above, in which case the glazed vitreous-enamel re-liquifies under the second or final firing to provide the required partial amalgamation of the frits as aforesaid.

It has been found that silica sand or the like may be used instead of the second frit. Under this alternative, the silica is applied in the same manner described for the second frit, dried, and fired either simultaneously or sequentially, as outlined above in connection with two frits. It must be remembered, however, that the final firing temperature must be definitely lower than that which would liquify the silica, and at least equal to the temperature required to mature the first frit. When using silica instead of the second frit, final firing is complete, when the fillet **16** forms adjacent the junction of the surfaces of the two materials, as described hereinbefore in connection with the two frits. At this time the receptor is removed from the furnace, and it will be observed that the surface of the areas containing the silica have a fine granular-texture elevated relative to the glazed enamel-surface.

From the foregoing, it will be apparent that the texture of the surface provided by the second frit, or silica, is largely dependent upon the proximity of the final firing temperature to the temperature required to fully mature the second frit, or silica, into a glazed surface. Accordingly, in order to provide the most effective "non-slip" floor surface with a minimum area for the "traction-spots," it is preferable to maintain the final firing temperature definitely lower than that required to mature the second frit, or silica, but at least equal to that required to mature the first frit into a glazed, vitreous-enamel surface. Also, the time of firing must be controlled, and the receptor removed as soon as the first frit is matured and the fillet **16** forms. This is important in order that the traction-surface provided by the second frit, or silica, remains elevated relative to the surface of the glazed, vitreous-enamel.

When the final firing temperature is definitely higher than that required to mature the first frit, and only slightly lower than that required to mature the second frit, a relative finer texture is provided for the surfaces of the traction-spots. In order to obtain sufficient traction from this relative finer texture, a modified construction must be employed. Therefore, it was observed that a stencil providing a uniform distribution of relatively small pads of the second frit or silica, resulted in the glazed vitreous-enamel surface provided by the first frit having a

plurality of uniformly distributed protuberances upon completion of the final firing; the protuberances resulting from the partially matured second frit. This construction and arrangement is illustrated in Figures 4 and 5, which, for the purpose of illustration, are shown on a greatly enlarged scale.

Under this construction and arrangement it has been found advisable to use a screen, or preferably a cord netting, for the stencil, which stencil is laid directly on top of the first dried frit, and the second frit applied by spraying. As in the case of the former method, the first frit need only be dried sufficiently to prevent a mixing of the frits when the second frit is applied. Inasmuch as the floor of the receptor is depressed, it was observed that a cord netting followed the contours of the outer surface of the applied first frit, and thus retained definite areas of the first frit between the pads of the second frit. In the final firing of a receptor, treated as outlined above, at a temperature relatively close to the maturing temperature of the second frit, it is important to control the duration of firing, and to remove the receptor from the furnace before the partially liquified second frit runs and flattens out the protuberances. In connection with the latter, it is to be understood that the first frit may be fired before or simultaneously with the second frit in the same manner outlined in connection with the relatively lower maturing temperature described for Figures 1, 2 and 3. Thus, it is to be observed that although the two "non-slip" floor surfaces have different physical properties, they do have in common the features (*a*) of elevating the traction-spots, (*b*) uniformly distributing the traction-spots, (*c*) providing drainage channels between the elevated traction-spots, which channels have a glazed surface that directly communicate with the main drain (*d*) the use of two frits having different maturing temperatures, and (*e*) the depositing of the second frit on top of the at least partially dried, or fired, first frit.

Having thus described my invention, I claim:

1. A receptor for a shower-bath cabinet having a vitreous-enamel coating, the said coating having portions of its outer surface elevated relative to the remaining portion thereof, the outer surface of the remaining portion of the said vitreous-enamel coating having a smooth glazed-surface and the outer surface of the elevated portions having a relatively rough matte surface, thereby to provide traction for the outer surface of the said vitreous-enamel coating.

2. A receptor for a shower-bath cabinet having a vitreous-enamel coating, the said coating having an embossed designed formed integral therewith for providing portions of the outer surface of the said coating elevated relative to the remaining portion thereof, the outer-surface of the said remaining portion having a smooth glazed-finish and the outer surface of the said elevated portions having a finish substantially dull and rough relative to the said glazed-finish.

3. A receptor for a shower-bath cabinet having a vitreous enamel coating, the said coating having definite portions of its outer surface elevated relative to the remaining portion thereof to provide an embossed configuration thereon, the outer surface of one of said portions having a smooth glazed-finish, and the outer surface of the other of said portions having a rough finish relative to the glazed-finish of the said one portion, thereby to provide traction for the outer surface of the said vitreous-enamel coating.

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