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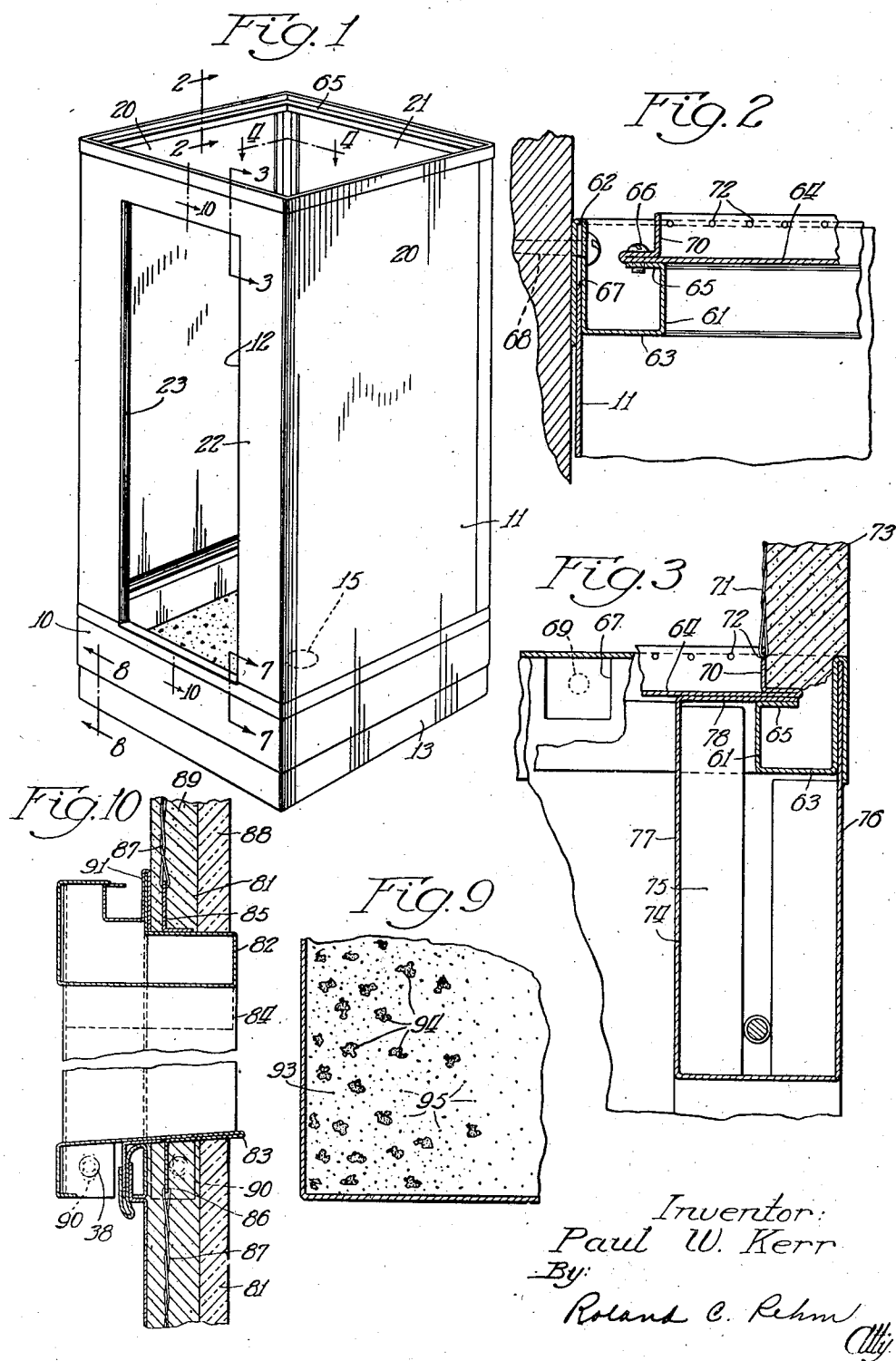
P. W. KERR

2,294,914

SHOWER BATH CABINET

Filed July 15, 1940

2 Sheets--Sheet 1



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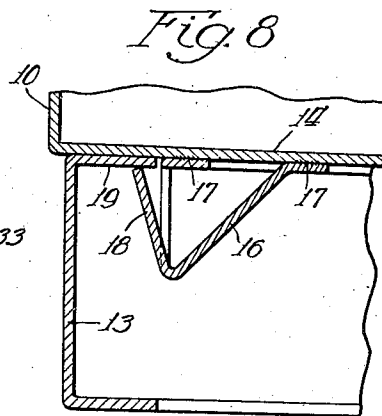
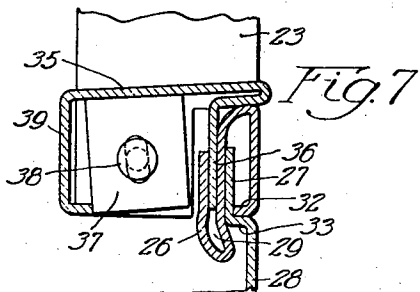
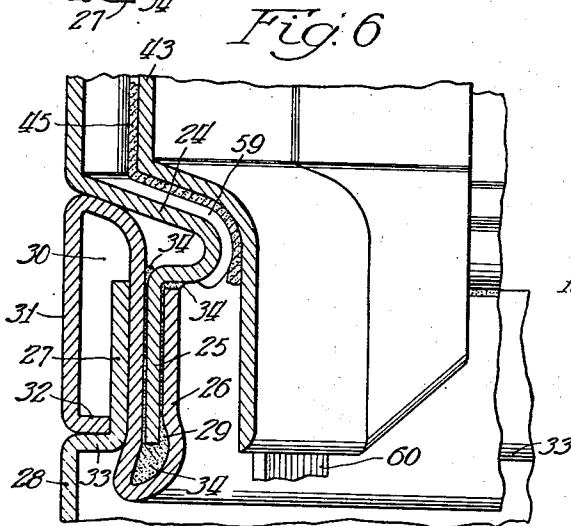
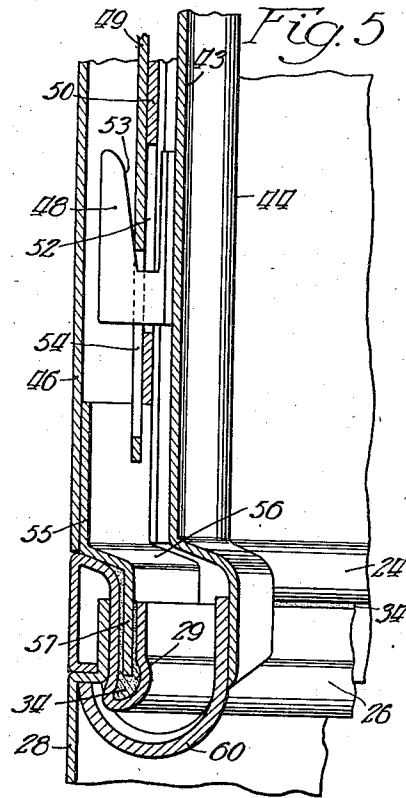
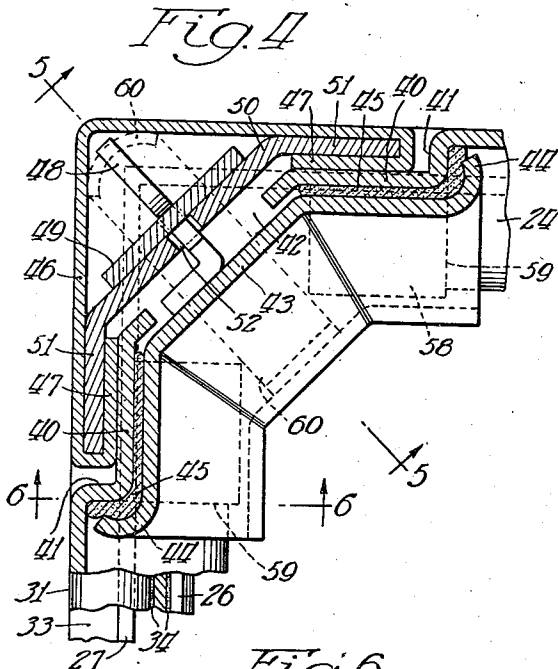
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2 Sheets-Sheet 2



Inventor:
Paul W. Kerr
By: Roland C. Rehm *Att.*

UNITED STATES PATENT OFFICE

2,294,914

SHOWER BATH CABINET

Paul W. Kerr, Elkhart, Ind., assignor to Henry Weis Manufacturing Company, Inc., Elkhart, Ind.

Application July 15, 1940, Serial No. 345,514

3 Claims. (Cl. 117-103)

This invention relates to shower bath cabinets, and among other objects aims to provide a knock-down sheet metal shower cabinet which can be produced at lower cost than heretofore and will have a quality and decorative appearance in harmony with standard bathroom design.

The nature of the invention may be readily understood by reference to one construction embodying the invention and illustrated in the accompanying drawings.

In said drawings:

Fig. 1 is a perspective view of a shower cabinet;

Fig. 2 is a vertical section of a detail taken on the plane 2-2 of Fig. 1;

Fig. 3 is a vertical section above the entrance to the cabinet and taken on the plane 3-3 of Fig. 1;

Fig. 4 is a plan section on an enlarged scale taken through a corner of the cabinet on the plane 4-4 of Fig. 1;

Fig. 5 is a vertical section through the corner construction taken on the plane 5-5 of Fig. 4;

Fig. 6 is a vertical section taken on the plane 6-6 of Fig. 4;

Fig. 7 is a vertical section through the door sill taken on the plane 7-7 of Fig. 1;

Fig. 8 is a vertical section through the base of the cabinet taken on the plane 8-8 of Fig. 1;

Fig. 9 is a plan view of the receptor bottom; and

Fig. 10 is a fragmentary sectional view illustrating a form of door frame construction which may be employed if the front of the cabinet be faced by conventional wall surfacing such as plaster or tile. The section corresponds to the plane 10-10 of Fig. 1.

Knock-down sheet metal shower cabinets possess many advantages over the conventional built-in shower cabinets characterized by marble or other slab side walls and terrazzo or similar receptors. To be acceptable as equipment for the better classes of bathrooms, such sheet metal cabinets must harmonize with standard bathroom design. The illustrative shower cabinet possesses all the advantages inherent in knock-down sheet metal shower cabinets, yet its design is such as to render it capable for use as equipment in installations of the highest class.

As here shown, the shower bath cabinet comprises the receptor 10 forming the floor of the cabinet, and sheet metal side wall sections 11 forming the cabinet enclosure except for the doorway 12. The latter may be closed either by a curtain or door, as desired. The receptor advantageously rests upon a base 13, whose height

is preferably sufficient to accommodate both the dish of the receptor bottom 14 and the drain outlet fixture 15, which is connected to the receptor bottom at its lowest point. The base 13 is here shown of channel section and the receptor is centered thereon by downwardly projecting brackets 16 welded or brazed as at 17 to the bottom of the receptor. An outwardly bent resilient tongue 18 struck from the bracket is adapted to spring under the upper edge 19 of the base when the receptor is seated to lock the latter to the base.

Both the side walls and the receptor are designed to be finished in porcelain or other enamel, preferably to harmonize in color with the other bathroom fixtures. Porcelain enamel is preferably used for the better grade of cabinets, since this is a standard finish for other bathroom fixtures. However, porcelain enamel on sheet metal has, heretofore, been impracticable because of chipping or cracking of the relatively brittle enamel on flexible sheet metal, because of the warping of the sheet metal side walls under enamelling heat, and because of the slipperiness of a porcelain enamelled receptor. The present construction makes the use of porcelain enamel practicable in shower cabinets.

Both the receptor and side walls are formed of sheet enamelling iron or steel, 16 to 14 gauge metal being satisfactory for a receptor and a somewhat lighter gauge, 20 to 16 gauge, being satisfactory for the side walls. The side walls are here shown formed in three sections, namely, two side sections 20 and a back section 21. The side sections are here shown including the front wall portions 22, which are formed to provide the side stiles 23 of the door opening. To facilitate coating with porcelain enamel, it is sometimes desirable to make separate front, side and rear sections—in which event each vertical corner will be provided with a common joint.

The lower margins of the side walls are bent inwardly as at 24 and terminate with a downwardly projecting flange 25, which is seated in a frame 26 embracing the upper edge 27 of the receptor side walls 28 (see Fig. 6). Frame 26 is advantageously of sheet metal formed to provide a channel 29 for the side wall flange 25, and another channel 30 for fitting over the receptor side walls. The margin 27 of the receptor side walls is preferably offset inwardly so that the outer face 31 of the frame is flush with the outer face of the receptor side wall 28. The frame is here shown provided with an inwardly bent terminal flange 32 which rests upon the offset 33 of the receptor. It will be observed (Fig. 6) that

the lower portion of channel 29 is offset outwardly to snap under offset 33, thereby assisting in anchoring the frame to the receptor. The channel 29 in the frame is advantageously filled with a plastic cement 34 or plastic caulking compound which flows around the flange 25 when it is inserted in the channel and serves to seal the channel against the entrance of moisture.

A door sill 35 covers that portion of the frame 26 which extends across the doorway. The sill is provided with a downwardly projecting flange 36 which is seated in the channel 29. Downwardly projecting end flanges 37 carried by the sill are connected by bolts or rivets 38 to the stile faces 23. The inner edge of the sill is finished by a downwardly extending flange 39.

As here shown, the joints between adjacent side wall sections are located at the corners of the cabinet. The adjacent margins 40 of the side wall sections (see Fig. 4) are inwardly offset at 41, and the space 42 between them is spanned by a corner strip 43, which extends across the margins 40 and is provided with outwardly bent side margins 44 extending behind the offsets 41 to prevent the separation or displacement of the side wall margins. Gaskets 45 of semi-plastic material serve to seal the joint between the side wall margins and the corner strip 43. The gaskets are clamped between the side wall margins and the corner strip 43 by an outer corner member 46, whose flanges 47 lie behind and engage the side wall flanges, and which is drawn toward the corner strip by clamping means. The clamping means are here shown in the form of hook-shaped cam lugs 48 carried by the corner strip 43 and a slotted locking strip 49 associated with the outer corner member. In the present case, the corner member 46, which is made of relatively thin sheet metal, carries a slotted corner bar 50 whose side margins 51 extend under the folded over flanges 47 of the corner member. The slots 52 in the bar 50 are of sufficient length to admit the lugs 48, and when the latter have been passed through the slots, they are engaged by the slotted locking strip 49 which acts against the inclined or beveled faces 53 of the lugs 48 to create the aforesaid clamping action between the corner strip 43 and the outer corner member 46. To apply the corner strip 43, the locking strip 49 is moved so that its slots 54 register with the slots 52 in the corner bar. After the lugs 48 have been passed through the registered slots, the locking strip 49 may be driven down from the top of the cabinet to create the aforesaid clamping action.

The corner bar 50 terminates short of the bottom of the corner member 46 to accommodate a bottom fitting 55 (see Fig. 5) which is inserted under the folded over flanges 47 and is connected to the corner member 46 in any appropriate way such as welding or by prick-punching the flanges 47 into the metal of the fitting. The latter is inwardly offset as at 56 and provided with a downwardly extending angular flange 57 (in alignment with the flanges 25) which is seated in the channel 29 across the corner of the receptor. The inwardly offset portions 56 of the member 55 are overlapped by the ends 58 of the offset portions 24 of the side walls. Preferably such ends are upwardly and inwardly offset as at 59 (Figs. 4 and 6) by an amount equal to the thickness of the offset portion 56 and flange 57. The overlapping of the bottom fitting 55 by the side margins of the

side walls, as aforesaid, avoids the possibility of any leakage at this point.

The corner strips 43 are advantageously provided with locking members in the form of hooks 60 which engage the under face of the offset portions 33 of the receptor, thereby firmly locking the cabinet side walls to the receptor.

The upper edge of the cabinet is advantageously finished by a frame 61 formed with a channel 62 fitting over the upper edge of the side walls and an inwardly extending molding 63 of rectangular section. If desired, a sheet metal top 64 may be placed upon the molding 63 and connected to its flanges 65 by screws 66. The upper edges of the side walls are preferably notched as at 67 at a plurality of points (see Figs. 2 and 3), so that if desired, wood screws 68 or the like may be driven through the frame 61 into the building walls, without requiring the drilling of the metal of the side walls. Such notched portions 67 are concealed by the channel 62 of the frame. Preferably, the metal of the frame is indented or otherwise marked at points 69 in registry with the notches, so that the metal may be drilled at the proper points if it be desired to employ anchoring screws 68. The screws would be hidden from below by the molding 63 even if no top 64 were used.

The top 64 is advantageously provided with a marginal flange 70 spaced a distance from the front and side walls of the equivalent to the thickness of the conventional wall plaster or other wall surfacing. If it be desired to extend curtain walls from the upper edges of the cabinet to the ceiling of the room, this can be easily done by connecting metal lath 71 or the like to the flanges 70 of the top (which are preferably perforated as at 72 for this purpose). The lath may, thereupon, be coated with plaster 73 flush with the face of the cabinet.

The lintel 74 which extends across the door opening is provided with flanges 75 bolted or otherwise connected to the faces of the stiles. The front face 76 of the lintel extends into the channel of the top frame and its rear face 77 is provided with a top flange 78 extending over the flange 65 of the molding.

In Fig. 10 is illustrated a door frame construction designed to be substituted for that shown in Figs. 3 and 7, in the event the front of the cabinet is to be faced with a tile, plaster or other wall surfacing 81. In the latter construction, the lintel, sill and stiles differ from those illustrated in Figs. 3 and 7, largely in the provision of extensions 82, 83 and 84 which project outwardly from the front face of the cabinet a distance sufficient to accommodate the wall surfacing 81 and to serve as a so-called stop therefor. In addition, the lintel, sill and stile extensions 84 are provided with welded or integral flanges 85 and 86 or their equivalent by which metal lath 87 or the like may be anchored to the door frame. In the present instance, the wall surfacing comprises tile 88 laid upon a cement surface 89 carried by the metal lath.

The aforesaid construction permits the cabinet to settle slightly independently of the wall surfacing 81, thereby protecting the latter against stresses which might crack it. It will be noted that the sill end-flange, through which the attaching bolt or rivet 38 passes, is slotted as at 90 to allow the cabinet to settle slightly without disturbing the sill or the wall surfacing 81 connected thereto. Likewise, the cabinet wall may drop slightly in or relative to the channel

91 of the lintel to allow the cabinet to settle independently of the lintel.

It will be understood that the surfaces of those cabinet walls which are covered by a plaster or other wall surface need not have the enamel finish which is provided for all exposed cabinet surfaces.

The sheet metal side walls are preferably finished by an enamel coating of an appropriate color. For better grades of cabinets, the coating is preferably vitreous porcelain enamel which may be applied to advantage by the so-called wet process. In this process, a ground or grip coat is sprayed or otherwise applied to the sheet metal surfaces and either dried at room temperatures or in a drying oven for about an hour and a half at a temperature of about 150° F. The ground coat is then burned or fired in an enamelling oven for about six minutes at about 1550° F.

All margins, inside and out, of the side walls are preferably coated with so-called flexible enamel which, at the present time, is available only in dark colors. Black is preferably employed since it can be so used as to have a decorative effect. The marginal black stripes are preferably wider than the margin covered by the corner structure to leave a narrower stripe of about 1/8 of an inch visible. The visible portion of the black stripe thus has a decorative effect. After drying, the enamelled margins are burned at about 1550° F.

Thereafter, the color or finish coats (in this case two coats) are applied by spraying or otherwise applying enamel material which will burn to the desired color. Preferably the coats are each successively dried and fired. This insures that the final or top coat will obliterate any imperfections in the underlying coat. After drying and before firing, the finish coatings are removed along the margins so as to leave a uniform width of black margin visible. To fire the enamel, the articles are placed in an enamelling oven and subjected to temperatures of about 1600° F. for about six minutes. The greater flexibility of the black enamel on the margins allows the latter to flex sufficiently to flatten any warped surfaces at the corner joints without danger of breaking or cracking the enamel finish.

The receptor bottom may advantageously be finished to provide a decorative and contrasting effect. The receptor is first coated with a ground or so-called grip coat (applied by dipping or spraying) which is dried and then fired in the enamelling oven at about 1600° F. As well known in the art the grip coat is made of materials which on fusion in the enamelling oven bond well with the metal. One pleasing effect can be obtained by applying a background coat (over the grip coat) of black or dark enamel which is preferably dried and then fired in the enamelling oven at about 1600° F. Upon this background coat a contrasting speckle coat of lighter color is applied so as to fall in large separated drops on the background coat. These spread to irregular and varying areas about 1/8 of an inch in diameter and smaller, which in contrast with the dark background coat give an attractive finish. The speckle coat may advantageously be a shade of green. The coarse stippling or speckled effect may be produced by lowering the air pressure on the spray gun so that the enamel is deposited in large spaced drops with only a limited number of fine drops. If a uniform or plain color coat be desired, the fin-

ish enamel may be sprayed on the receptor in the usual way. With either method of finishing, the coat is dried and subsequently fired at about 1500° F. for about six minutes. Instead of the stipple coat the receptor bottom may be finished with a continuous coat of any desired color.

The receptor bottom is advantageously provided with a sanitary slip-proof surface by incorporating in the enamel surface a refractory granular material, such as fine silica sand, which does not fuse at the temperatures at which the vitreous enamel fuses and, therefore, remains projecting above the enamel surface after firing.

Although the grains of sand retain their identity and do not melt down as does the enamel material, there is sufficient superficial or incipient fusion between the enamel and the grains of sand to bond them integrally with the enamel coat, thereby resulting in an enamel coat which is an integral continuous enamel surface despite the fact that the grains of sand project above the surface. To simplify description, I shall use the expression "sand" or "grains of sand" in a generic sense to include not only silica but other refractory materials which integrally bond with the vitreous enamel to provide a slip-proof surface. There are no microscopic cracks or potential cracks between the grains of sand and the enamel (such as might exist if the grains of sand were simply mechanically anchored in the coat) into which water might enter and (through development of the cracks) eventually reach the metal to produce rust stains.

The superficial fusion which integrally bonds the sand grains with the enamel may possibly be brought about by a eutectic condition since it occurs at temperatures far below the fusion temperature of the grains of sand. Another explanation, which probably is not essentially different, is that the fluxing substances in the fused enamel also superficially flux and fuse the grains of sand. Whatever the explanation, the fact is that firing does not substantially fuse the sand grains; they project above the vitreous surface to render it slip-proof.

On microscopic examination, little enamel is visible on the sand grains above the level of the vitreous enamel, and generally the projecting grains of sand are free of enamel. If any enamel does cover the grains of sand it is in such a thin film as not to be visible or substantially to affect the sharpness of the projecting grains. Probably much of the enamel material which may originally have covered the grains has receded on fusion. One important characteristic of the surface revealed by a microscopic examination is that the surface is free of cavities or recesses which might harbor germs and fungi. The grains of sand are generally polyhedral in shape and do not project far enough to form any recesses or cavities. It is not essential for an adequately slip-proof surface that the grains of sand be close together. Indeed they can be well separated so that there is no opportunity for adjacent grains to form cavities or recesses above the surface. The surface is, therefore, of such character that it may be kept clean and sanitary by simple scrubbing with a brush.

Difficulty has been experienced in securing uniform distribution of the sand grains not only over a given receptor but in giving the surfaces of successive receptors the same slip-proof texture. It is, of course, essential for commercial production that there be uniformity of product.

While the sand grains could be applied simply

by sprinkling the same over the enamel material before firing, I have found that as a practical matter it is impossible by sprinkling methods to secure uniformity. The grains of sand are not visible on the enamel material and neither uniformity nor degree of concentration can practically be determined by other than visual methods.

This problem has been satisfactorily solved by incorporating the sand in the enamel material and applying the same by spraying. This enamel contrasts with the previously applied enamel coat and by means of the contrast the operator can not only obtain a uniform distribution of sand grains but a proper concentration thereof. Though the sand grains are invisible, their concentration and distribution corresponds with the concentration and distribution of the enamel material and the latter by reason of its contrast with the background can be controlled visually. This contrast exists even though the enamel material be the same (as regards color) as that of the background, since the wet unfired material differs in appearance from the fired enamel. This method can be employed either for a stipple finish or a continuous solid color coat, since in both cases the contrast between the previous coat and the fresh enamel material as it is applied permits uniformity of application and proper concentration of the sand grains. The difference in method for stipple and solid color finish is mainly one of degree. For the solid color the operator simply continues application of enamel material by spraying until the under coat is entirely and uniformly concealed. The under coat may advantageously be dark, thereby increasing the contrast with freshly applied material. For a stipple finish it is desirable to reduce the air pressure on the spray gun to develop a certain proportion of large drops along with fine ones.

The grains of sand may be incorporated in the enamel material by adding the sand to the previously prepared enamel material and if necessary maintaining the same in suspension during spraying by agitation of the mixture. With this method, grain size of minus forty to plus sixty mesh is satisfactory. The sand may also be incorporated by grinding silica or other refractory with the frit in preparation of the enamel material. In preparing enamel material it is generally the practice to grind the frit in the enamelling plant together with the desired coloring material as and when it is required. Enamel frit is an article of commerce and is formed by fusing together the various enamel ingredients (generally without color) and then pouring the same into water to form coarse granular material in which condition it is obtained by the enamelling plant. The desired coloring materials are then added, and for the so-called wet process these materials are ground in water to the desired fineness. When adjusted to the proper fluid consistency, this mixture may be applied by spraying. The slip-proof enamel material is made in the same way simply by adding to the frit the desired amount of slip-proof material, such as silica sand. The grinding process very thoroughly mixes the various ingredients and doubtless reduces the sand grains in size. While the sand grains in the ground material seem to the eye to be about as small as the ground frit, I suspect that because of their greater hardness they are not ground quite so fine. In any event in the fired product the enamel fuses down and

recedes, leaving the sand grains projecting above the enamel surface.

In Fig. 9 an attempt has been made to illustrate the sand particles and fine drops of enamel in the stipple finish by fine dots 95, but it should be understood that exact illustration is impossible since the particles of sand alone are practically invisible and are individually much smaller than illustrated. It is also difficult to illustrate the relative concentration of the sand particles but preferably the concentration is greater than that illustrated, the effect being more like fine sand paper except that the particles of sand are not as sharp as in sandpaper and not nearly so concentrated.

If desired, the enamel containing the slip-proof material may be applied in a design pattern, either stippled or in solid color. This is advantageously accomplished by placing a stencil with the design over the receptor bottom and spraying the slip-proof finish over the stencil. One such design is illustrated in co-pending Hoople design application, Serial No. D-92,931 filed June 5, 1940, patented December 17, 1940, Des. 124,031. The enamel material thus serves the dual function of providing a slip-proof surface and a pleasing design on the receptor bottom. Preferably the design is of such character as not to leave large areas in which occurs no slip-proof material. The lines of the design as well as the blank areas covered by the stencil should preferably be directed toward the drain 15 to assist in flushing away soap and other sediment and to eliminate any regions where soap and other sediment might collect. This is exemplified in the aforesaid design application. By making the stencil of magnetic material, such as sheet iron or steel, it may be held down tightly against the receptor bottom by a magnet located below the receptor. When thus held tightly the enamel material does not creep below the stencil and marring of the stencil outline is thus avoided.

This application is a continuation in part of my copending application Serial No. 103,965 filed October 5, 1936.

Obviously the invention is not limited to the details of the illustrative constructions since these may be variously modified. Moreover, it is not indispensable that all features of the invention be used conjointly since various features may be used to advantage in different combinations and subcombinations.

Having described my invention, I claim:

1. The method of making a slip-proof sheet metal receptor for shower bath cabinets which comprises applying porcelain enamelling material to the bottom of the sheet metal receptor, then spraying on the background enamelling material contrasting in color with the background, the latter enamelling material containing grains of said which are substantially invisible in said enamelling material, carrying on said spraying operation under reduced pressure to cause the latter enamelling material to be applied in relatively large drops, limiting and controlling the distribution of sand and said latter enamel material by reference to the contrasting appearance of the latter enamel on the background, then firing the enamelling material at high temperature to fuse the same to the underlying surface and to the projecting grains of sand to provide an impervious coat on the metal, said grains of sand being of a size sufficient to project substantially above the enamelled surface.

2. The method of making a slip-proof sheet

metal receptor for shower bath cabinets which comprises applying porcelain enamelling material to the bottom of the sheet metal receptor, then applying in relatively large drops enamelling material contrasting in color with the background to which it is applied, the latter enamelling material containing grains of sand which are substantially invisible in said enamelling material, limiting and controlling the distribution and concentration of the sand and said latter enamel material by reference to the contrasting appearance of the latter enamel on the background, limiting the amount of enamel so that in the subsequently fired enamel the grains of sand will project from the enamel surface, and then firing the enamelling material at high temperatures to fuse the same to the underlying surface and to the projecting grains of sand to provide an impervious coat on the metal.

3. The method of forming a slip-proof finished surface on a metal receptor for a shower bath cabinet or the like which comprises suspending

particles of sand throughout a quantity of finely ground enamelling frit to provide a substantially uniform mixture, said particles being of higher melting point than the frit and individually substantially invisible in said mixture and said mixture having a color contrasting with that of the receptor surface, maintaining the sand particles in uniform suspension throughout the frit by dispersion in a liquid medium, spraying said mixture in the form of a thin coating of uniform thickness onto the receptor surface and controlling the thickness and uniformity of said coating by reference to said color contrast, limiting the thickness of the coating so that when fired portions of the particles of sand will project above the finished surface, and then firing the coating at such a temperature as to fuse the frit to the particles of sand and to the surface to which the coating is applied without substantially fusing the particles of said.

PAUL W. KERR.