Oct. 23, 1928. 1,689,062

P. F. TITCHENER

PROCESS FOR ENAMELING ARTICLES

Filed Aug. 18, 1926 2 Sheets-Sheet 1

Fig. 1.

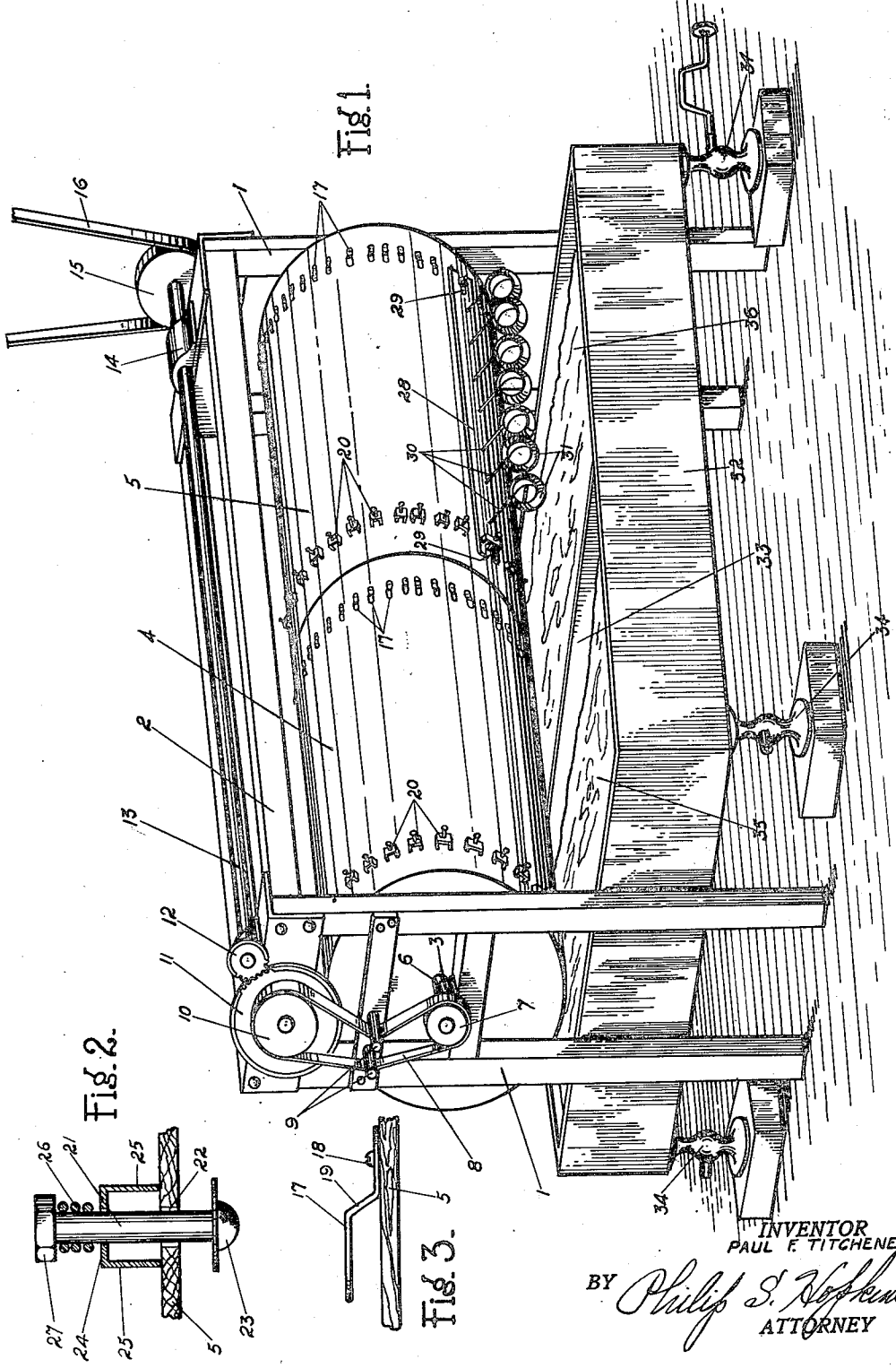


Fig. 2.

Fig. 3.

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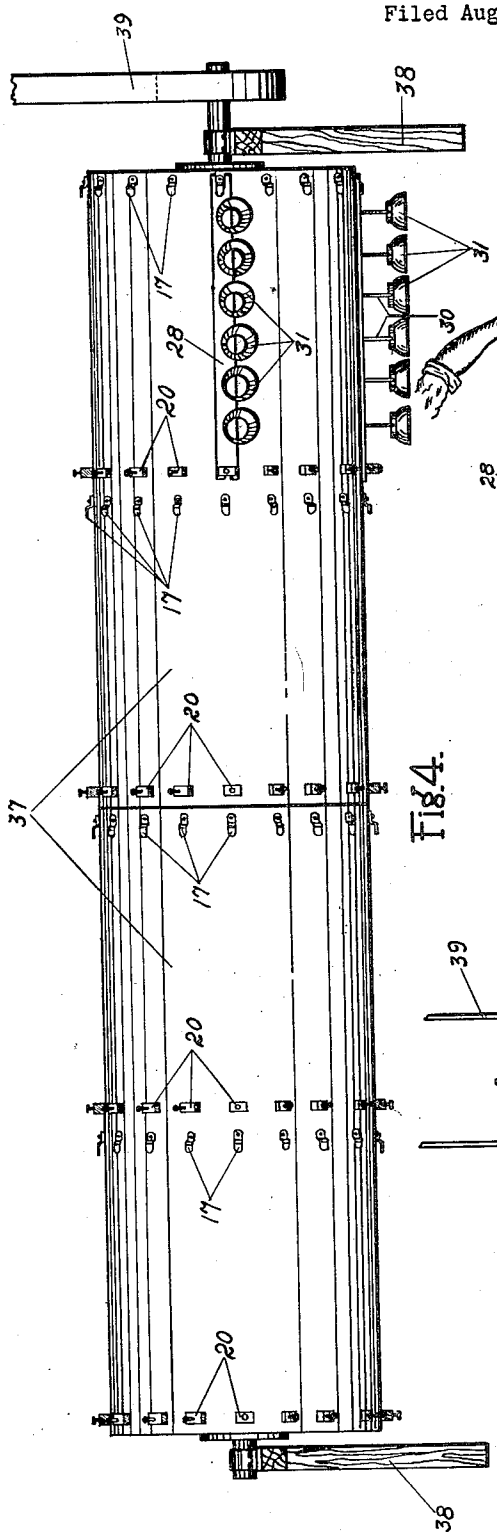


Fig. 4.

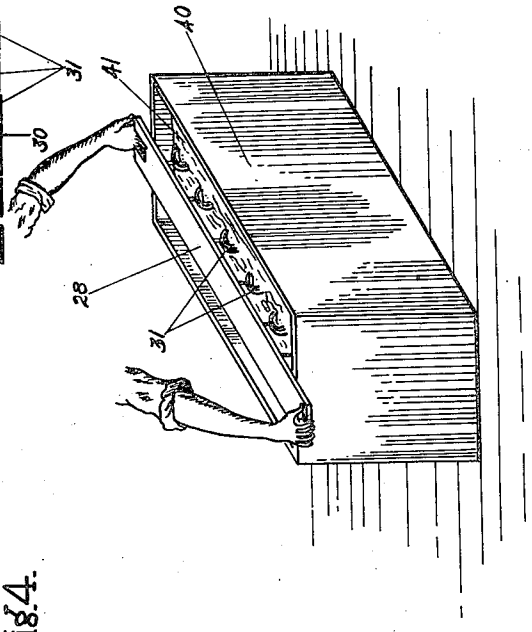


Fig. 6.

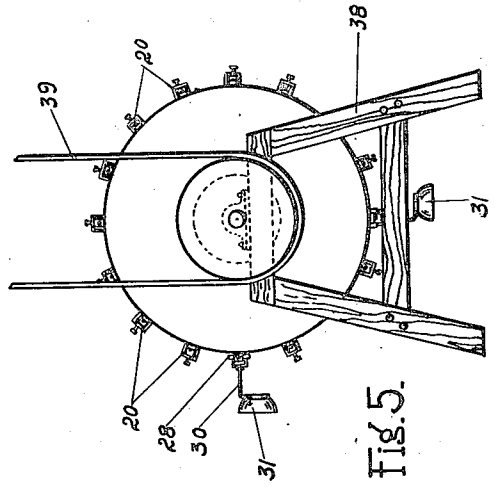


Fig. 5.

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UNITED STATES PATENT OFFICE.

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PROCESS FOR ENAMELING ARTICLES.

Application filed August 18, 1926. Serial No. 129,964.

My invention relates to a dipping process and the apparatus therefor used in enameling articles, particularly small articles such as bath room fixtures, and the like.

Ordinarily in enameling such articles, it is necessary to supply the enamel thereon by means of an air gun or other device which is not only difficult because of the many peculiar shapes of the articles to be enameled, but is also expensive because of the waste incurred with such a process.

Furthermore, it has heretofore been impractical to dip the articles in the enamel solution because of inadequate apparatus and process, and for the reason that in the ordinary dipping process in use, it is frequently impossible to secure an even, uniform coating of the enamel. Ordinarily as the articles have been dipped, the enamel adhering thereto drips and runs and accumulates in beads at various points on the articles, and if permitted to dry in such condition, result in a very inferior coating of the article.

To eliminate this difficulty and to provide a simple, inexpensive apparatus and process for dipping articles, I have conceived the invention hereinafter described in detail.

Referring now to the drawings wherein like reference numerals indicate like parts:

Figure 1 is a perspective view of a dipping apparatus used in carrying out my new process.

Figure 2 is a detail, partly in section, illustrating one of the clips used on the dipping apparatus.

Figure 3 is a detail side view of another of the clips used.

Figure 4 is a side view of the drying drum used in my process.

Figure 5 is an end view of the drum.

Figure 6 is a detail perspective illustrating another step of my improved process.

A suitable frame work comprising the end pieces 1 and top piece 2, rotatably supports as by bearings 3, the dipping drums 4 and 5. The shaft 6 of the drums carries at one end the pulley 7 over which runs a belt 8 guided by pins or rollers 9. This belt passes over a pulley 10 suitably journaled at one end of the top piece 2, which pulley has secured thereto a gear 11 meshing with a pinion 12 on a shaft 13 suitably journaled in the top piece 2 as by bearings 14. The shaft 13 is provided at its opposite end with a pulley 15 over which a driving belt 16 operates extending from the pulley 15 to any suitable source of power. This driving mechanism for the dipping drums 4 and 5 should be considered as illustrative only, as any other suitable type of driving mechanism may be substituted therefor.

The drums 4 and 5 are each provided at one end with the stationary clips 17 shown in detail in Figure 3. These clips are secured at one end as at 18 to the body of the drum and are provided with an offset portion 19 which raises the free end above the surface of the drum. The opposite end of each drum is provided with adjustable clips in alignment with the clips 17. These adjustable clips are indicated generally at 20, and as shown clearly in Figure 2, comprise a pin 21 slidable through a recess 22 in the drum and carrying at its inner end a head 23 to prevent removal of the pin from the drum. Slidable on the pin 21 is a catch member 24 formed of metal or other suitable material and provided with the legs 25 on two sides normally forced into engagement with the drum by means of the coil spring 26 engaging between the catch member 24 and the nut 27 attached to the outer end of the pin 21.

It will thus be observed that the catch member 24 may be raised to permit the insertion of an article support 28 shown clearly in Figures 1 and 4.

This article support comprises a strip of wood or other suitable material notched as at 29 at either end. One notched end of the strip 28 is slipped under the raised end of the stationary clip 17 while the other notched end engages around the pin 21 of the clip 24, the legs 25 of the clip having been raised against the tension of the spring 26 to permit the insertion of the end of the support and then lowered against said support where

the spring 26 serves to hold the same in position against accidental movement on the surface of the drum.

The carrier 28 is provided with pins or other suitable article holders 30 extending outwardly therefrom to receive the articles 31 to be enameled.

Adjustably supported directly beneath the drums 4 and 5 is an adjustable vat 32 partitioned centrally as at 33 dividing the same into compartments, one compartment under each of the drums 4 and 5. Jacks or screws 34 support the vat whereby the same may be adjusted vertically toward or away from the drums.

In the compartment 35 directly beneath the drum 4 there is placed the enameling solution used for the first coat commonly known as "flat or undercoat". In the vat 36 beneath the drum 5 is placed the enameling solution for the last coat or "finishing" coat. As the solution is used up in the compartments, the vat may be raised by means of the jacks 34 to bring the solutions within reach of the articles carried on the carrier 28.

These enameling solutions are preferably of lacquer enamel of air drying properties and of any desired known composition or formula.

Referring now to Figure 4, a second series of drums 37 are rotatably mounted on supports 38 and provided with any suitable means 39 for rotating the drums. It should be understood that there may be any number of these drums which are used for the purpose of drying the articles after they have been through the enameling solution, and also that any drum or set of drums may be provided with means for rotating them at various speeds. The drying drums 37 are provided with the same type of clips 17 and 20 as are on the dipping drums.

Figure 4 illustrates a tank 40 within which is placed a thinning solution 41 preferably consisting of a solvent of the material of which the enameling solution is made. During one step of the process, the articles 31 are dipped into this thinning solution for a purpose hereinafter described.

Briefly, the operation of my invention and the steps of the process are as follows: The operator first attaches the articles to be enameled to the pins or holders 30 on the carrier 28. This loaded carrier is then placed on the drum 4 and secured in position by means of the clips 17 and 20 heretofore described. It will be noted that provision is made on the drums for holding a large number of the article carriers 28.

The drum 4 is then rotated slowly and during this rotation the articles 31 are swept through the "flat or undercoat" solution in the compartment 35 of the vat, the solution adhering to the surface of the articles as the same are drawn through it. It should be stated here that the vat 32 may of course be made in two separate sections separately adjustable instead of the single vat divided into compartments.

As soon as the articles on a particular carrier have been swept through the "flat or undercoat" solution, the carrier 28 is removed from the drum 4 and immediately secured upon one of the drying drums 37 which is kept slowly rotating. The rotation of the drying drum keeps the enamel solution which has attached itself to the articles, in motion causing it to spread itself uniformly over the surface of the articles without draining or running to one particular position and drying in a bead.

As soon as the articles on a given carrier are dried, the carrier is removed from the drying drum and again attached to the dipping drum, this time to drum 5 where the articles are again swept through the enameling solution to receive the second coat, containing ingredients which will give a neat finished appearance to the articles. Once again, a coat of enamel attached itself to the articles and when the articles have been swept through this bath, the carrier 28 is again removed and the articles then dipped rapidly by hand into the tank 40 containing the thinning solution which has a tendency to thin the coating just applied and to smooth out any "beads" or "blisters" thereon. Of course, as many dippings in the tank 40 as are necessary to achieve the desired consistency of the glossy coating may be made. This carrier is then promptly attached again to the drying drum 37 and rotated as before, the enameling solution on the articles being free to flow over and smoothly locate itself on the articles while being dried.

It has been found by practical experience that this method and process of enameling and the apparatus therefor, results in providing the articles to be enameled with a very uniform and smooth coating without runs or dips. Of course the time element of dipping, drying, etc. may be adjusted for each type of article to be enameled as may be necessary. It will also be understood that many changes in details of constructions and operation may be made without departing from the spirit and scope of my invention. I do not limit myself therefore, to the exact form and method shown other than by the appended claims.

I claim:—

1. The process of enameling articles comprising the steps of dipping the articles in an enameling solution and before drying dipping them in a thinning solution of said enameling solution and then drying said articles while in motion.

2. The process of enameling articles comprising the steps of dipping them in an

enameling solution, drying them while in motion, then dipping them in a second enameling solution and without drying subjecting them to a thinning solution of said enameling solutions and drying them while in motion.

3. The process of enameling articles comprising the steps of sweeping them through an enameling solution, drying them while in motion, sweeping them through a second enameling solution and without drying, dipping them in a thinner of said second solution and then drying them while in motion.

PAUL F. TITCHENER.