

Oct. 23, 1934.

J. WINKLER

1,978,121

APPARATUS FOR EQUALIZING ENAMEL COATINGS

Filed July 25, 1930

3 Sheets-Sheet 1

Fig. 1.

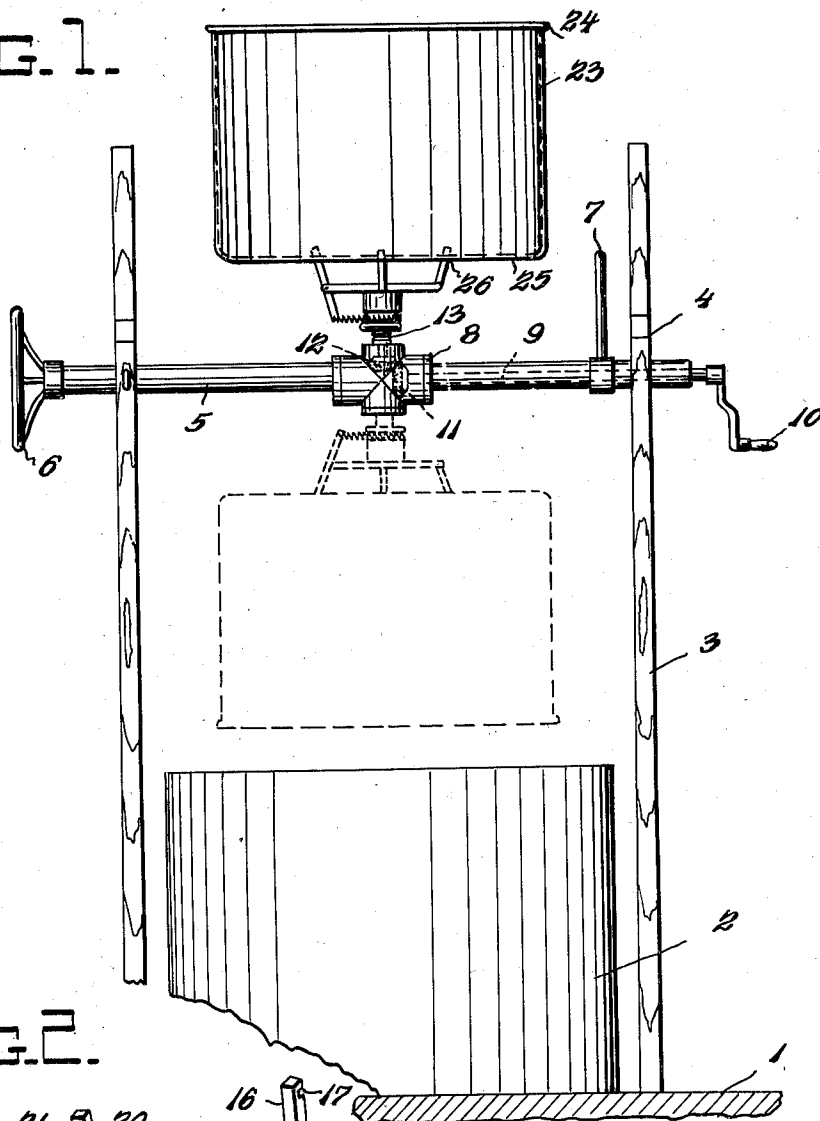
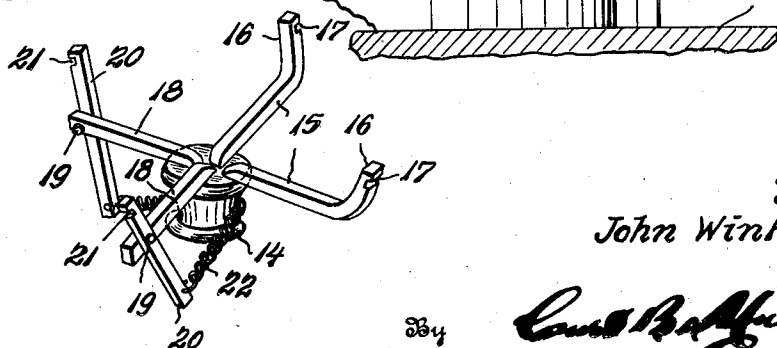


Fig. 2.



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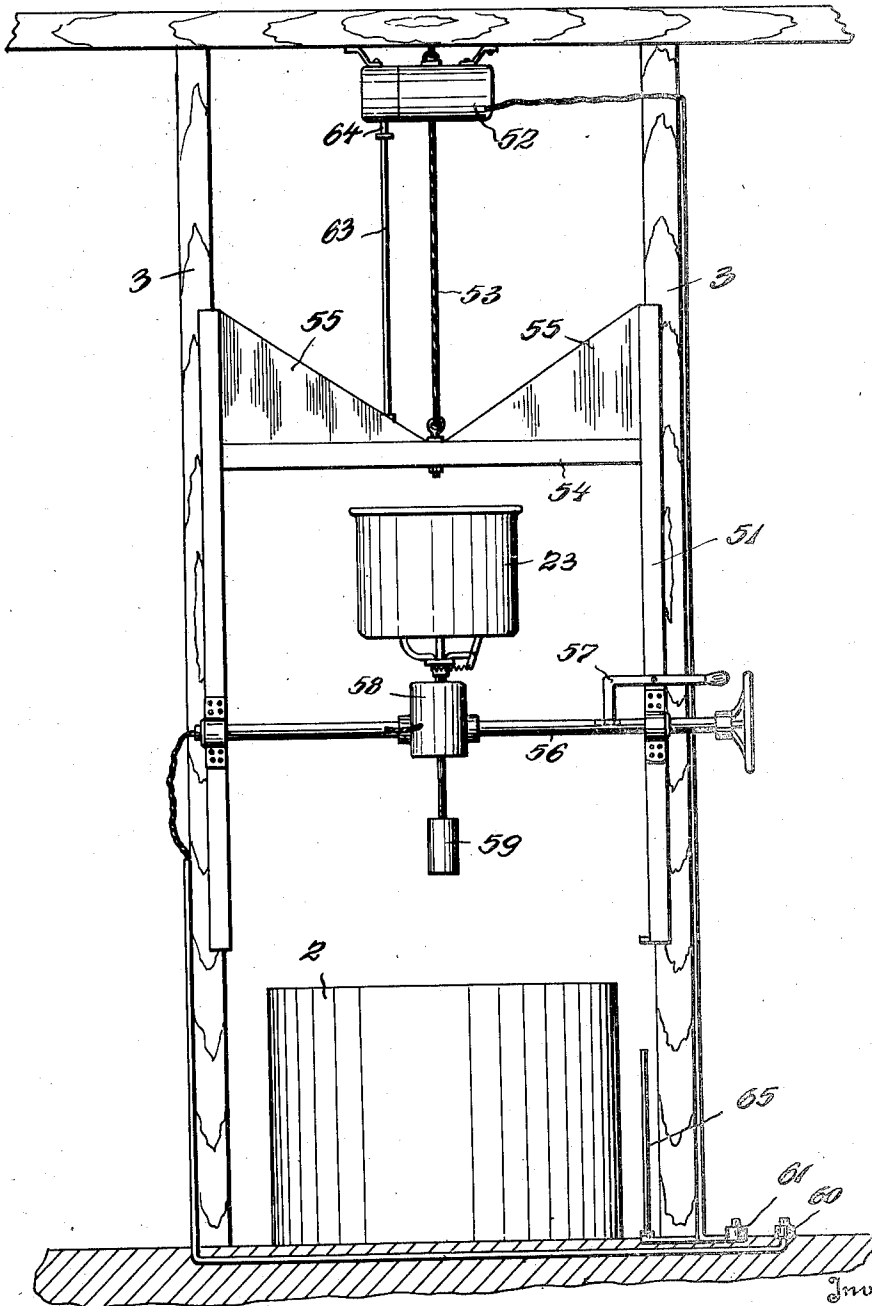
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FIG. 3.

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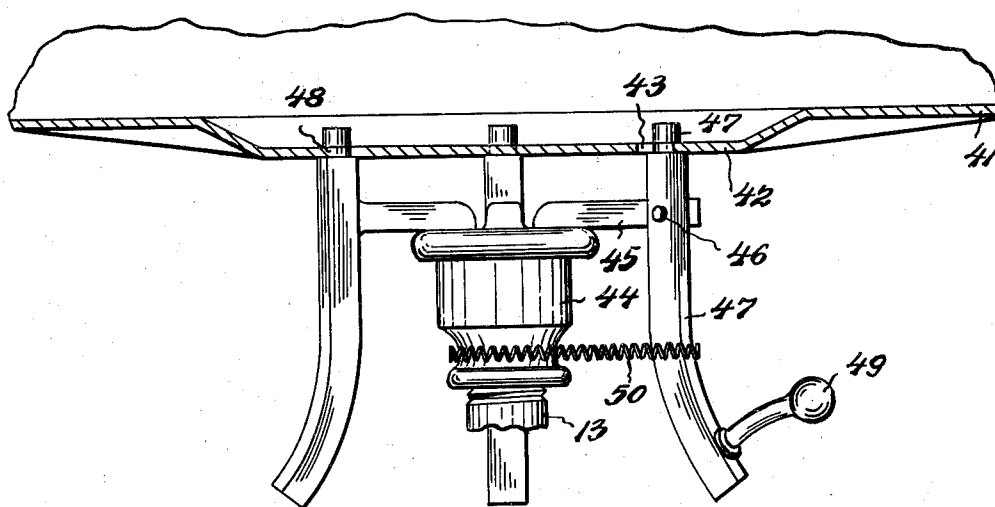
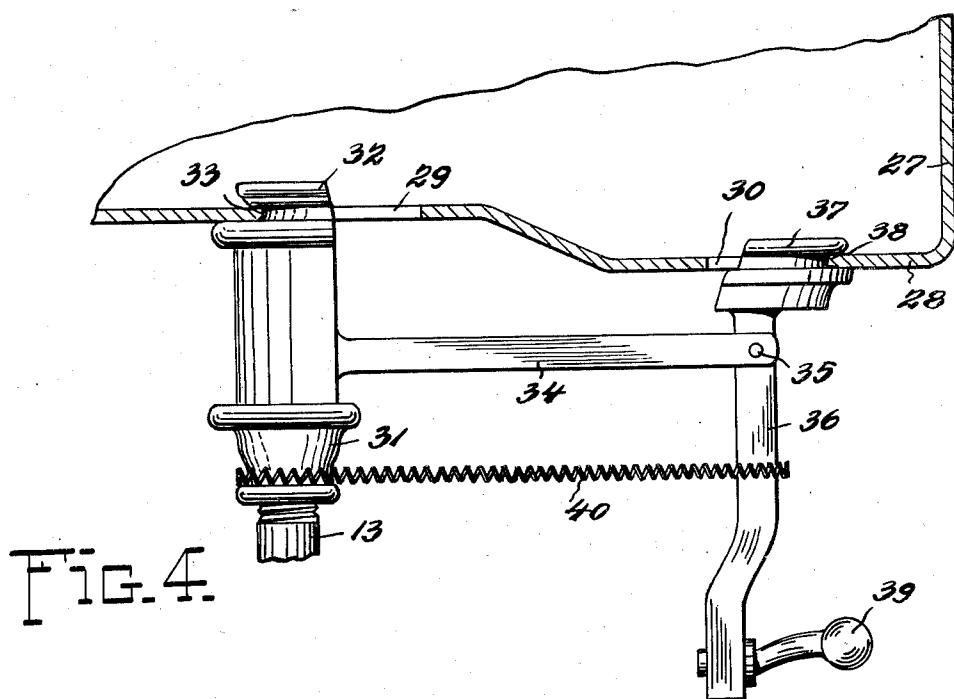
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APPARATUS FOR EQUALIZING ENAMEL COATINGS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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APPARATUS FOR EQUALIZING ENAMEL COATINGS

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Application July 25, 1930, Serial No. 470,685

2 Claims. (Cl. 91—46)

My invention pertains to apparatus for equalizing enamel coatings and more particularly to apparatus for removing surplus paint from articles which have been immersed therein. The drawings illustrate the application of my invention for equalizing the freshly applied enamel coating of wash machine tubs.

During the early years of domestic wash machine manufacture, the better tubs were mostly composed of copper. The last few years of increasing competition have caused an intensive striving for reduction in costs and produced the formation of sheet steel tubs provided with an enamel coating in substitution for tubs composed of copper. It was first supposed that a spray application of the enamel coating should be the most satisfactory, but experience has established that the sprayed application while convenient and apparently uniform does not effect as good a penetration of the enamel and cannot reliably insure an equal and uniform coating both to the interior and to the exterior. Any unevenness in the enamel coating will result, after burning or baking, in different shades, as streaks or blotches, and frequently will also cause cracks or so-called crazes. Contrary to expectation, my experience in this art has led me to discover that the application of the first enamel coating by dipping immersion could effect a quicker, cheaper and better job; quicker for obvious reasons, cheaper even if two men effected dipping and better because the metal surface is more uniformly penetrated when immersed and agitated during immersion.

In either case, whether the first coat be applied by spraying or dipping, it is very important to accomplish the draining off of surplus color, or to avoid a gravitational accumulation of surplus color at the lower interior corner or corners if the cup-shaped article is caused to rest upon its bottom after the application of the first coat, and at the upper rim of the cup-shaped article if it is caused to rest thereon in its inverted position following the initial coating. Such an accumulation of surplus enamel (usually at a convex or concave corner) will invariably cause a craze during or after burning. Many wash machine tubs now have their upper rims, in which a cover is to be fitted, formed with a downwardly curved flange or bead which retains the gravitational accumulation of surplus color if the article is deposited in its inverted position after application of the first coat, just as disadvantageously as the lower interior corners if the cup-shaped article afterwards be caused to rest upon its bottom and

such an occurrence likewise inevitably causes a craze during burning. The object of this invention is to make possible the avoidance of excessive accumulation of color even when a considerable amount of surplus color has been initially applied by immersion. The disclosed apparatus for both oscillating and rotating has proved highly successful for a considerable period of time of commercial production and not only causes the removal of all surplus enamel, but aids to accomplish a concluding uniformity of application of all the color which ultimately reaches the oven. This has been acknowledged by a growing list of customers.

It is to be realized that the scope of my invention comprehends many equivalent constructions. The showing of the drawings and the particular description are merely specific exemplifications of a plurality of mechanical embodiments and arrangements.

Adverting to the drawings:

Figure 1 is an end elevation partly in section showing apparatus embodying my invention for equalizing enamel coatings, the same being shown carrying a wash machine tub and straddling a receptacle containing the enamel into which the tub is to be immersed and into which surplus enamel will be permitted to drip.

Figure 2 is a perspective view of one form of tub-clamping attachment adapted to the particular design of tub which is illustrated in Figure 1.

Figure 3 is a elevational view showing in detail the means for bodily raising or lowering the tub carrying and actuating mechanism.

Figure 4 is a modified form of attaching clamp in substitution for the structure shown in Figure 2 and suited to a different design of tub bottom.

Figure 5 is an additional modification of attaching clamp in substitution for the structure shown in Figures 2 and 4 and suited to still another design of tub bottom.

On a floor 1 rests a suitably large receptacle 2 to contain the fluid enamel into which the articles carried by my apparatus are to be immersed. The apparatus is shown to include standards 3, which according to the simpler form shown in Figure 1 are provided each with a socket 4 wherein is turnably supported a composite sleeve 5 carrying on one end a hand wheel 6. Fixed to the sleeve, inwardly adjacent one of the standards, is a lever 7 likewise adapted to facilitate turning of the sleeve near its other end. At a point midway between the standards the sleeve structure comprises a gear housing 8.

Passing through one-half of the sleeve is a shaft 9 carrying on its outer end a crank 10. The inner end of the shaft 9 carries within the housing 8 a beveled pinion 11, which meshes with a mitre gear 12, which is fixed to a stub shaft having a screw-threaded outer end 13 which is detachably connected to a bracket nut 14. As will be readily understood, manipulation of the crank 10 will permit affecting the rotation of the nut 14 and the sleeve 5 may be simultaneously turned to impart a swinging or revoluble movement to the nut 14 about the axis of the shaft 9.

Fitted in any suitable manner in or detachably carried by the nut 14 are a plurality of arms 15 (four being illustrated) the outer ends of two of which are upturned at 16 and fashioned with outwardly presented slots 17 for a purpose hereinafter to be explained. Other arms 18 have pivoted to them at 19 a pair of fingers 20, the upper ends of which are similarly fashioned with outwardly presented slots 21 and the lower ends of which are yieldingly attached, by means of springs 22, to the nut 14. The slots 17 and 21 are circumferentially arranged in the same, substantially horizontal, plane and are adapted to receive correspondingly arranged portions of the bordering edge of an opening in the bottom of a tub 23, having a beaded rim 24 and bottom 25, which latter is centrally provided with an opening 26. The tub 23 is to be detachably carried or clamped for movement in unison with the nut 14. The yieldable movement of the two fingers 20 permits of insertion of the edge of the lower tub opening into the slot 17 (after actuating the upper ends of the fingers 20 inwardly) and affords also a limited range of adjustability to tub-bottom openings of varying size. When released from manipulation, the springs 22 will retract or pull the lower ends of the finger 20 toward the nut 14 and cause other edge portions of the tub bottom opening to occupy the slots 21. Manifestly, the tub carrying structure exerts a readily disengaged clamping action. Swinging of the crank 10 will affect rotational movement of the tub 23 whereas turning of the sleeve 5 may bring the tub 23 to its depending dotted-line position, as shown in Figure 1, preparatory to manual lifting of the sleeve 5 from the sockets 4 and thereafter lowering of the tub 23 until it is immersed in the enamel in the receptacle 2, following which the sleeve 9 is again caused to rest in the sockets 4 and after most of the surplus enamel has drained off, simultaneous rotation and oscillation of the tub is to be accomplished to effect the uniform distribution of the applied fluid coating without collection of surplus enamel anywhere.

Marketed wash machine tubs are of varied design both as to conformation of their bottom and as to provision of an opening or openings in their bottom for the ultimate reception of attaching of the particular type of manufacture. Figure 4 illustrates one modification of tub-attaching fixture suited to a design of tub 27 with a bottom 28 and central opening 29 and one or more radially outward openings 30. This modified fixture is likewise to be carried by the shaft 13 and comprises an elongated nut 31 fashioned with a double-beaded upper end 32 adapted to project through the opening 29 and to have an arcuate measure of its bead-interjacent annular channel occupied by a corresponding arcuate extent of the bordering edge 33 of the opening 29. Extend-

ing radially outward from the nut 31 is an arm 34 to which is pivoted at 35 a lever 36 similarly fashioned with a double-beaded upper end formation 37 to be intersected by a portion of the outwardly disposed bordering edge 38 of the opening 30. The lower end of the lever 36 carries a handle 39 to facilitate rocking of it about the pivot 35 and against the action of a spring 40 which tends to maintain the interlocked or clamp connection with the edges 33 and 38.

Figure 5 illustrates a further modification of tub-attaching fixture adapted to a tub 41 having a bottom 42 fashioned with a plurality of circumferentially arranged openings 43. This design of fixture includes a nut 44 to be similarly secured to the shaft 13, a plurality of laterally divaricating arms 45, to one or more of which is pivoted at 46 a lever 47, the upper grooved end of which projects through the opening 43. The other arm or arms 45 are fixedly connected with upstanding studs 48 provided with whole-edge-accommodating grooves near their upper ends. The upper end of the pivoted levers 47 may be moved to their disengaging positions by pulling a handle 49 against the action of a spring 50.

My preferred form of commercial structure substitutes a power actuated hoist for raising and lowering a tub carried by its appropriate fixture. This is shown in Figure 3 wherein, in the support which includes the standards 3 there is mounted a slidable frame 51, which is to be moved up and down by means of a standard electric hook-suspension hoist 52 having a cable 53 which is connected to the frame 51 by a cross-beam 54 provided with a reinforcing webbing 55. Turnably mounted on the frame 51 is a sleeve 56 (equivalent to sleeve 5) having a locking catch 57. A motor 58 is connected to said shaft and carries a counterweight 59 to equalize the weight of the boiler 23 which is to be enameled. A switch 60 operates the motor 58 and a double switch 61 controls the hoist 62 for up and down movement. A bar 63 which is connected to the webbing 55 abuts against a control switch 64 of the hoist which is adapted to stop the motor of the hoist when the frame 52 reaches its uppermost position. An abutment switch control 65 stops the hoist when the frame 52 reaches its lowest position which it occupies when the tub 23 is immersed in the receptacle 2.

I claim:

1. In apparatus for use in conjunction with a coating bath, a support, a sleeve rotatably mounted on said support, a housing carried by said sleeve, means for supporting the work to be immersed in the bath, comprising a rotatable shaft, a motor in said housing for rotating said shaft and the work, and means for revolving said sleeve.

2. In apparatus for use in conjunction with a coating bath, a support, a sleeve rotatably mounted on said support, a housing carried by said sleeve, means for supporting the work to be immersed in the bath, comprising a rotatable shaft, a motor in said housing for rotating said shaft and the work, means for revolving said sleeve, said sleeve having a groove therein and a latch mounted on said support for engagement within the groove of the sleeve to restrain said sleeve against movement.

JOHN WINKLER.