Jan. 27, 1931. V. A. FOX 1,790,501

OVEN AND DIP TANK

Filed June 22, 1928

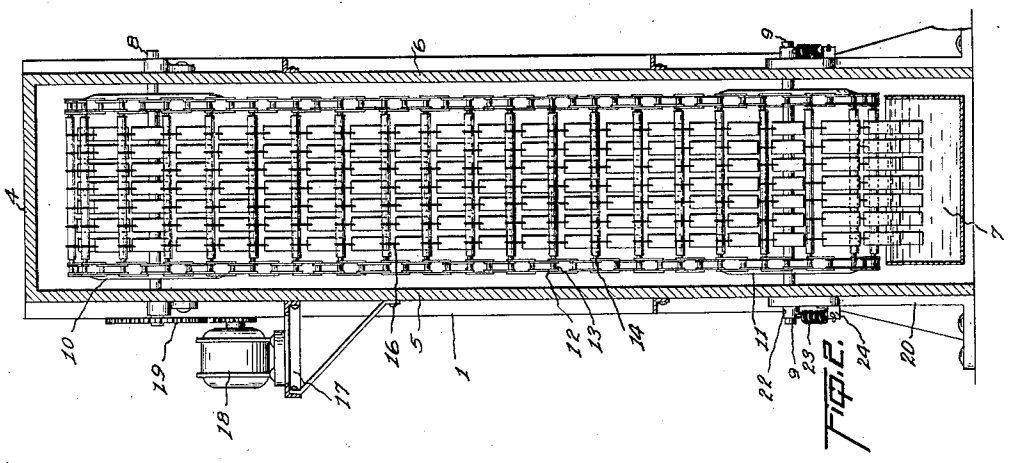


Fig. 2.

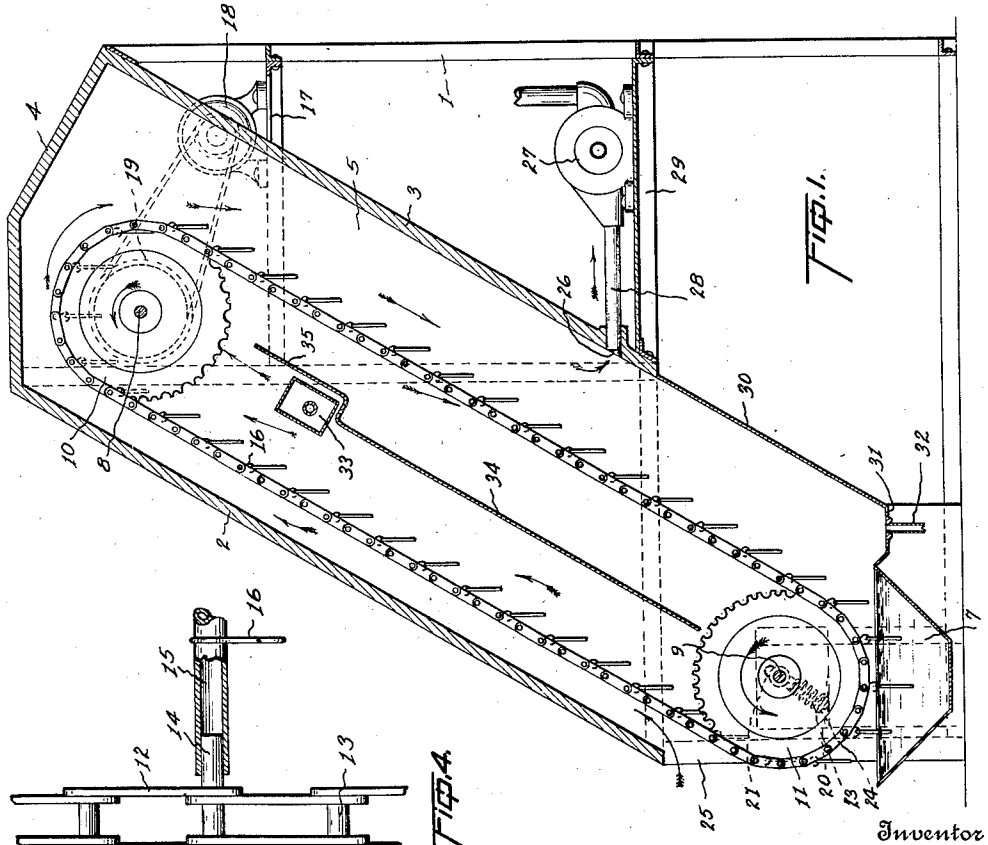


Fig. 1.



Fig. 4.

Fig. 3.

Inventor

Vernie A. Fox

By Bartlett & Bartlett

Attorney

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# UNITED STATES PATENT OFFICE

VERNIE A. FOX, OF DETROIT, MICHIGAN, ASSIGNOR TO YOUNG BROTHERS COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

## OVEN AND DIP TANK

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The present invention pertains to a novel oven for drying metal plates which have been coated with paint, enamel or similar material.

The object of the invention is to provide for the dipping of the plates within the oven, so that it will not be necessary to handle or transfer the plates manually between the coating and drying operations. The invention further provides a means for supporting the plates in such a manner that the drippings will fall directly upon a drain board rather than on other plates.

The invention is fully disclosed by way of example in the following description and in the accompanying drawings, in which—

Figure 1 is a vertical section of the device;

Fig. 2 is a vertical section beneath the forward wall;

Fig. 3 is a detail section of the conveyor in a plane parallel to that of Figure 1; and

Fig. 4 is an elevation at right angles to Figure 3, partly in section.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

In Figure 1 is shown a framework 1 which supports an inclined oven comprised of parallel inclined walls 2 and 3, a top 4, and lateral walls 5 and 6. The lower part of the oven is open and is positioned over a dip tank 7. Shafts 8 and 9 are journalled in the upper and lower ends respectively of the oven and carry each a pair of sprocket wheels 10 and 11. Each pair of aligned wheels is trained by an endless sprocket chain consisting of double links 12 united by hinge pins 13. Certain of the pins are extended slightly inward as at 14 for the purpose of supporting parallel tubes 15 as shown in Figure 4, whereby the conveyor chain is completed. Hooks 16 of S-shape are suspended from the rods for the purpose of supporting apertured plates which will maintain a vertical position while being carried by the conveyor.

Between the framework 1 and lateral wall 5 is supported a shelf 17 on which is mounted a motor 18 for driving the shaft 8 through gearing 19. At the base of the conveyor are provided a pair of upright bearings 20 having each a slot 21 in which the ends of the shaft 9 are accommodated. The lateral walls 5 and 6 are similarly slotted for the shaft. Each end of the shaft 9 is surrounded by a loose collar 22 connected by a retractile spring 23 to a lug 24 extending from the corresponding bearing 20, whereby the shaft is maintained in its lowest possible position and the conveyor chains are held taut at all times in response to contraction and expansion thereof due to the heat conditions in the oven.

The sprocket wheels 10 and 11 are caused to turn in counterclockwise direction as viewed in Figure 1, so that the lap adjacent the front wall 2 moves downwardly towards the tank 7. Directly above the tank, the forward wall is formed with an opening 25 which serves as the air inlet and also the entrance for work to be hung on the hooks 16. At the opposite side or wall 3 of the conveyor is an air exhaust port 26 connected to an exhaust fan 27 by means of a pipe 28. The fan is mounted on a shelf 29 secured between the frame 1 and the wall 3. The lower part of the wall 3 is comprised of a suitable drain plate 30, at the lower edge of which is a trap 31 having its base below the upper level of the dip tank 7 and having a drain pipe 32 leading from the base.

A heating element 33 of any desired character is positioned between the two sides of the conveyor, preferably a short distance beneath the shaft 8. A baffle 34 is also mounted between the laps of the conveyor and has its longitudinal edges fixed in the lateral walls 5 and 6. The upper part of the baffle is bent at 35 to extend between the heating element and the ascending side of the conveyor so that it functions as a partition to prevent direct flow of hot air from the heating element to the exhaust port 26.

In the operation of the device the work is entered through the opening 25 and suspended on the hooks 16 as already stated. The work immediately enters the dip tank 7 and is carried upwardly by the ascending side of the conveyor, during which time it is permitted to drain upon the plate 30 and into the trough 31. While rising to the level of the exhaust port 26, the work is in a com-

paratively cool zone of the oven, so that it may properly drain before the excess coating becomes baked thereon. When the work has passed in to the hotter region above the exhaust port, the excess coating has drained off. It is to be noted that the permanent vertical position and spaced relation of the plates prevents the drippings from upper plates to fall on lower plates, and in this way one of the principal difficulties in dipping practice is overcome. The work undergoes further drying treatment until reaching the opening 25 on the descent, and is then removed from the oven through the same opening.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:—

1. In combination with an inclined endless conveyor, a dip tank at the lower end thereof and adapted to receive articles carried by the conveyor, a heating element between the laps of the conveyor, and a baffle between said element and one of said laps.

2. In combination with an inclined endless conveyor, a dip tank at the lower end thereof and adapted to receive articles carried by the conveyor, a heating element between the laps of the conveyor, an oven enclosing said conveyor, air inlet and exhaust means at opposite sides of the oven, and a baffle between said heating element and exhaust means.

3. In combination with an inclined endless conveyor, a dip tank at the lower end thereof and adapted to receive articles carried by the conveyor, a heating element between the laps of the conveyor; an oven enclosing said conveyor, air inlet and exhaust means at opposite sides of the oven, said inlet means being adapted for entrance of work into the oven, and a baffle between said heating element and exhaust means.

4. In combination with an inclined endless conveyor, a dip tank at the lower end thereof and adapted to receive articles carried by the conveyor, a heating element between the laps of the conveyor, an oven enclosing said conveyor, air inlet and exhaust means in said oven at the descending and ascending sides respectively of said conveyor, and a baffle between said heating element and air exhaust means.

5. In combination with an inclined endless conveyor, a dip tank at the lower end thereof and adapted to receive articles carried by the conveyor, a heating element between the laps of the conveyor, an oven enclosing said conveyor, air inlet and exhaust means in said oven at the descending and ascending sides respectively of said conveyor, said inlet means being adapted for entrance of work into the oven, and a baffle between said heating element and air exhaust means.

6. In combination with an inclined endless conveyor, a dip tank at the lower end thereof and adapted to receive articles carried by the conveyor, a heating element between the laps of the conveyor, an oven enclosing said conveyor, air inlet and exhaust means in said oven at the descending and ascending sides respectively of said conveyor, a baffle between said heating element and air exhaust means, said exhaust means being disposed at a substantial distance above the dip tank, and the oven wall beneath said means being adapted to function as a drain plate.

In testimony whereof I affix my signature.

VERNIE A. FOX.