Feb. 11, 1930. V. A. FOX 1,746,645

DOUBLE DECK OVEN

Filed June 22, 1928

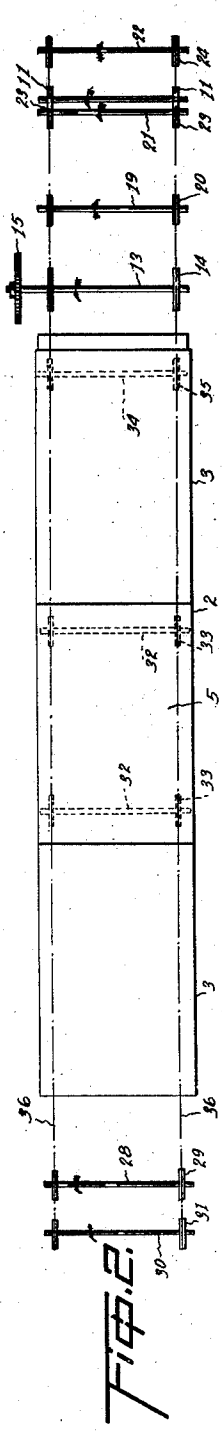


Fig. 2.

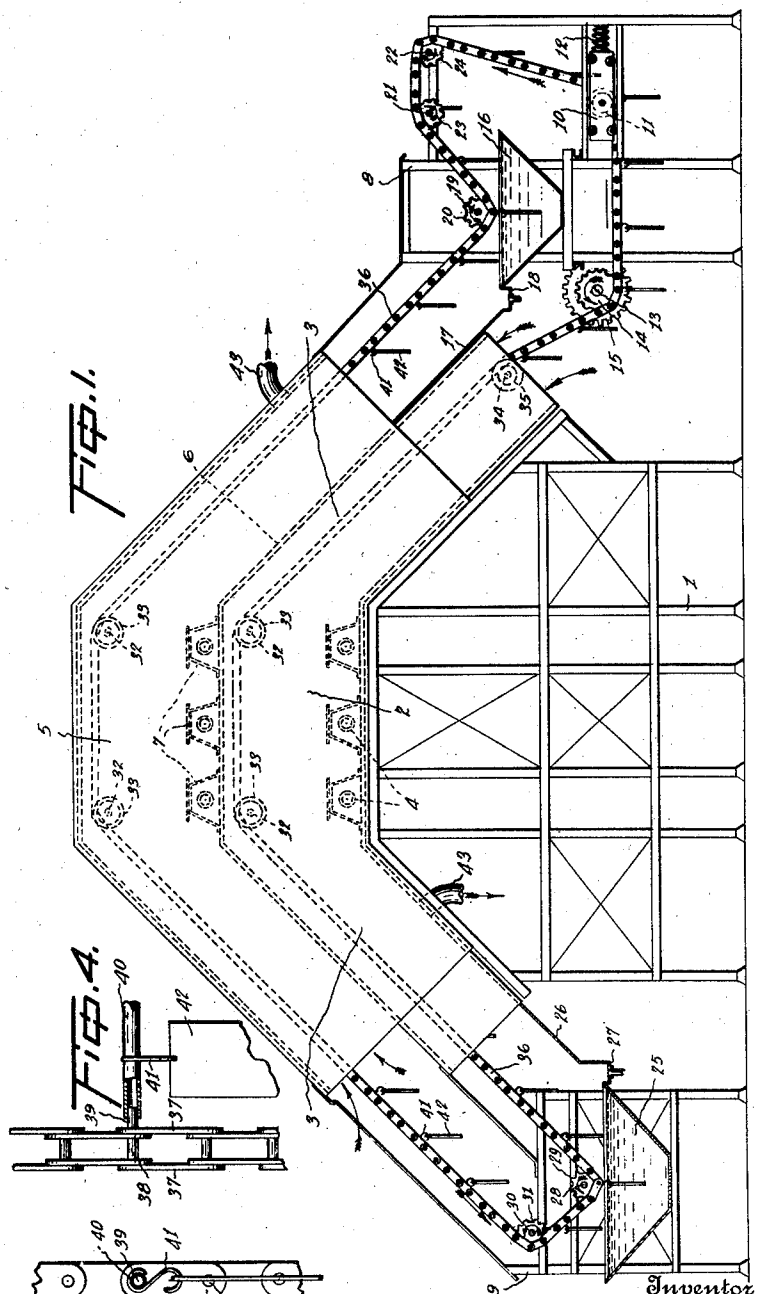


Fig. 1.

Fig. 4.

Fig. 3.

Inventor
Vernie A. Fox

By

Attorney

Patented Feb. 11, 1930 1,746,645

UNITED STATES PATENT OFFICE

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

DOUBLE-DECK OVEN

Application filed June 22, 1928. Serial No. 287,527.

The present invention pertains to a novel oven for drying plates which have been coated with paint, enamel or similar substance, and the principal object of the invention is to effect economy in floor space and materials.

An oven of this general character is provided with a conveyor passing therethrough for carrying the plates which are to be dried. The conveyor is usually an endless device having two laps, and one of these laps is generally idle, functioning only to carry the work from the loading station to the oven or to deliver it from the oven to the unloading station. The present invention provides an oven comprising two tunnel sections, one superimposed upon the other, and an endless conveyor having a lap travelling through each such section. Heat is generated in both sections, whereby a given length of drying area is obtained on half the floor space that would otherwise be required. Also, both laps of the conveyor are operative in carrying the work through a drying zone, and at the ends of the tunnels are provided dip tanks in which the work may be immersed before entering each tunnel.

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

Figure 1 is a side elevation of the apparatus, partly in section;

Fig. 2 is a plan view thereof, showing the conveyor schematically;

Fig. 3 is a detail elevation of the conveyor chain; and

Fig. 4 is a detail plan view thereof, partly in section.

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

On a framework 1 is built an oven section or tunnel 2 of the self-sealing type shown in my copending application, Serial No. 287,531 filed June 22, 1928, and having branches 3 which extend downwardly from the intermediate or horizontal zone which contains the heating elements 4. Another such section or tunnel 5 is superimposed upon the lower tunnel and has its bottom wall 6 in common with the tunnel 2. The tunnel 5 also contains heating elements 7 in the higher or horizontal zone thereof. It will already be apparent that the common wall 6 effects an economy in building material and further eliminates two radiating surfaces that would be present if the tunnels were disposed side by side or end to end. In addition there is a saving in floor space by the superposition of one tunnel upon the other.

At the ends of this structure are built scaffolds 8 and 9 for supporting other parts of the apparatus. The scaffold 8 supports a rolling carriage 10 carrying sprocket wheels 11 and connected by a spring 12 to one of the posts of the scaffold, whereby the sprocket wheels are normally drawn away from the adjacent end of the tunnels. Adjacent the end of the lower tunnel 2 is mounted a shaft 13 which may be accommodated in bearings supported by the scaffold 8. This shaft carries a pair of sprocket wheels 14 near its ends and also a drive gear 15. A dip tank 16 is supported by the scaffold substantially in line with the adjacent sloping arm of the tunnel 5, and a drain plate 17 runs along the upper surface of the common wall 6 and terminates in a trough 18 adjacent the tank 16. Above the tank is supported another shaft 19 carrying sprocket wheels 20 in line with the wheels 14. Another pair of shafts 21 and 22 are supported above the carriage 10 and outwardly with respect to the shaft 19, and these shafts 21 and 22 are equipped with sprocket wheels 23 and 24 respectively in line with the wheels 14 and 20.

The scaffold 9 supports a dip tank 25 which is bridged to the adjacent lower edge of the tunnel 2 by a drain plate 26 formed with a trough 27 at the inner edge of the tank. Above the center of the tank is mounted a shaft 28 having sprocket wheels 29 at its outer ends and in line with those already described, and at a higher level, and in an outer position is mounted a similar shaft 30 carrying sprocket wheels 31 also in line with the other wheels. In the upper corners of each tunnel are mounted shafts 32 carrying sprocket wheels 33 at their ends in line with the other sprockets. The end of the lower section 2

adjacent the shaft 13 supports still another shaft 34 carrying sprocket wheels 35 aligned with the others.

A conveyor built upon a pair of chains 36 is trained over the several aligned sprocket wheels as shown diagrammatically in Figure 2. The carriage 10 maintains the chains in a taut condition in response to the expansion and contraction caused by the heat of the furnace. Each chain is comprised of double links 37 joined by pins 38, some of which are extended inwardly as at 39 for supporting transverse tubes 40 therebetween. S-shaped hooks 41 are hung on the rods, and metallic sheets 42 to be treated are suspended from the hooks as shown more clearly in Figure 4.

The conveyor is driven in the direction of the tank 16 to the upper section 5 as indicated by the arrows in Figure 1, and from the tank 25 into the lower section 3. At the inlet end of each section is provided an exhaust pipe 43 connected to a suitable suction fan which need not be illustrated in the present instance. By means of this device, fresh air is drawn into each section through the opposite end and over the heating elements, so that the current of air is opposite to the path of the conveyor.

In the operation of the device the conveyor is loaded and unloaded at the scaffold 8 and before reaching the tank 16. The work is immersed in this tank before entering the upper section 5, and the apparatus is built so that the coating received in the tank 16 will be dried when the work issues from the upper section. Passing out of this section, the work enters the second tank 25 and is delivered to the lower section 2. This section also is built to dry the second coating by the time the work issues therefrom, so that the conveyor may be unloaded and recharged at the scaffold 8 as already indicated.

Certain economies resulting from this structure have already been explained, and it will now be apparent that the device is further advantageous in utilizing both laps, or the entire length of the conveyor for carrying the work through drying zones.

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 an oven, two tunnels, one superimposed upon the other, a dip tank at one end of one tunnel, another dip tank at the opposite end of the other tunnel, and a conveyor passing over said tanks and having a lap passing through each tunnel.

2. In an oven, two tunnels, one superimposed upon the other with a common wall therebetween, a dip tank at one end of one tunnel, another dip tank at the opposite end of the other tunnel, and a conveyor passing over said tanks and having a lap passing through each tunnel.

3. In an oven, two tunnels, one superimposed upon the other, a dip tank at one end of one tunnel, another dip tank at the opposite end of the other tunnel, and a conveyor having a lap passing through each tunnel, said conveyor passing over one tank and over and beneath the other tank.

4. In an oven, two tunnels, one superimposed upon the other with a common wall therebetween, a dip tank at one end of one tunnel, another dip tank at the opposite end of the other tunnel, and a conveyor having a lap passing through each tunnel, said conveyor passing over one tank and over and beneath the other tank.

In testimony whereof I affix my signature.

VERNIE A. FOX.