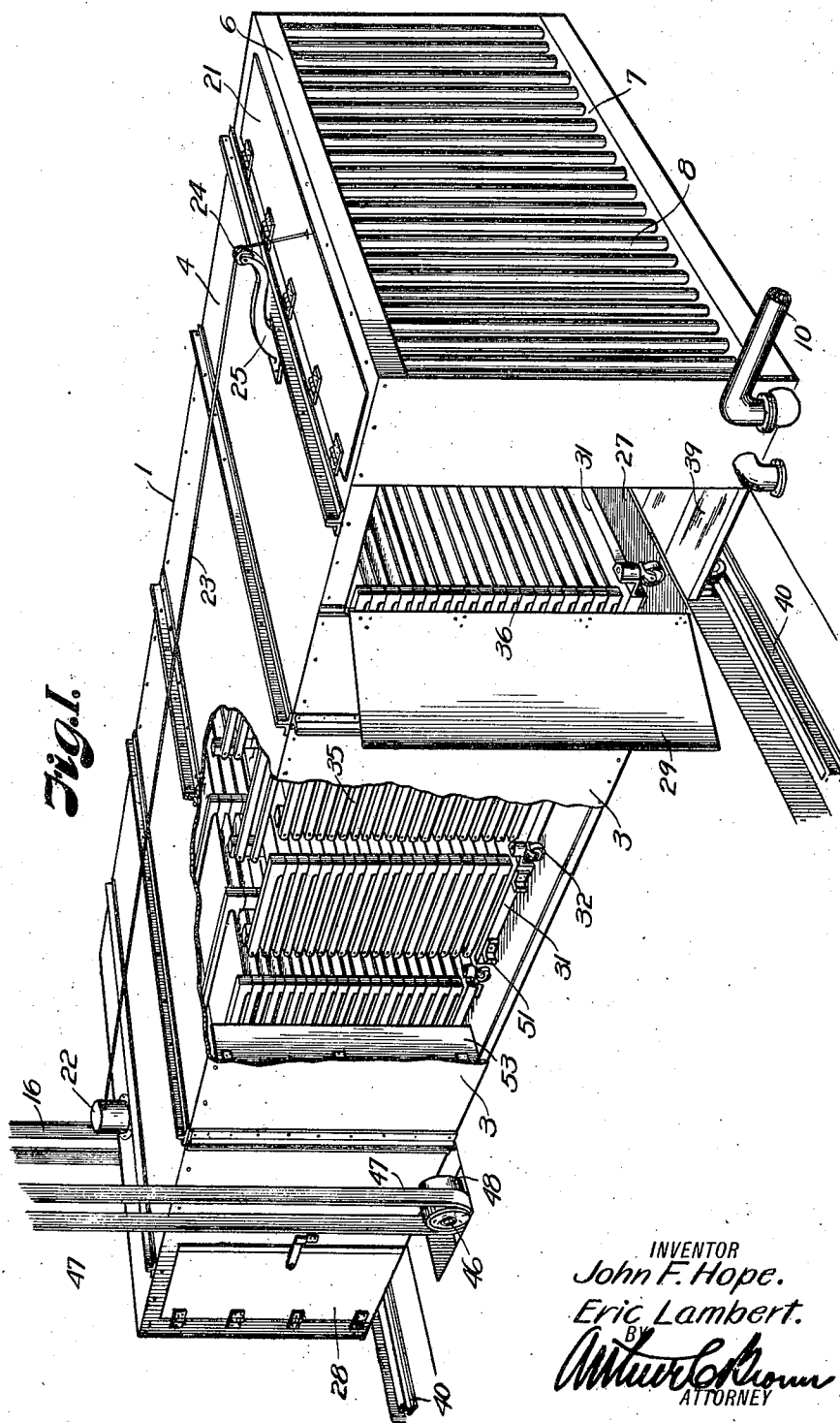


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 APPLICATION FILED NOV. 29, 1915.

1,353,591.

Patented Sept. 21, 1920.

2 SHEETS—SHEET 1.



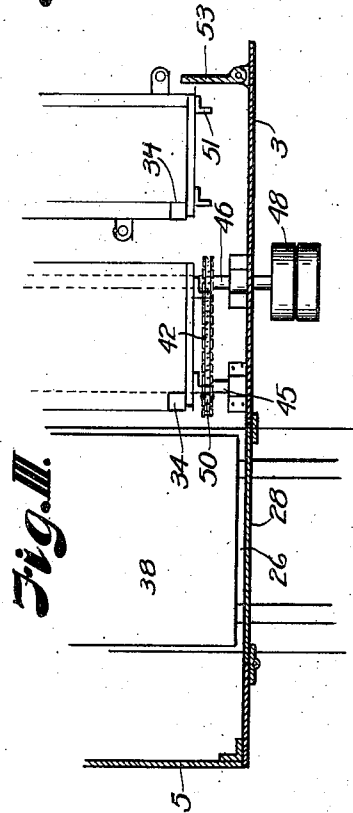
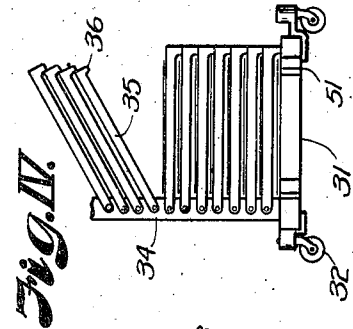
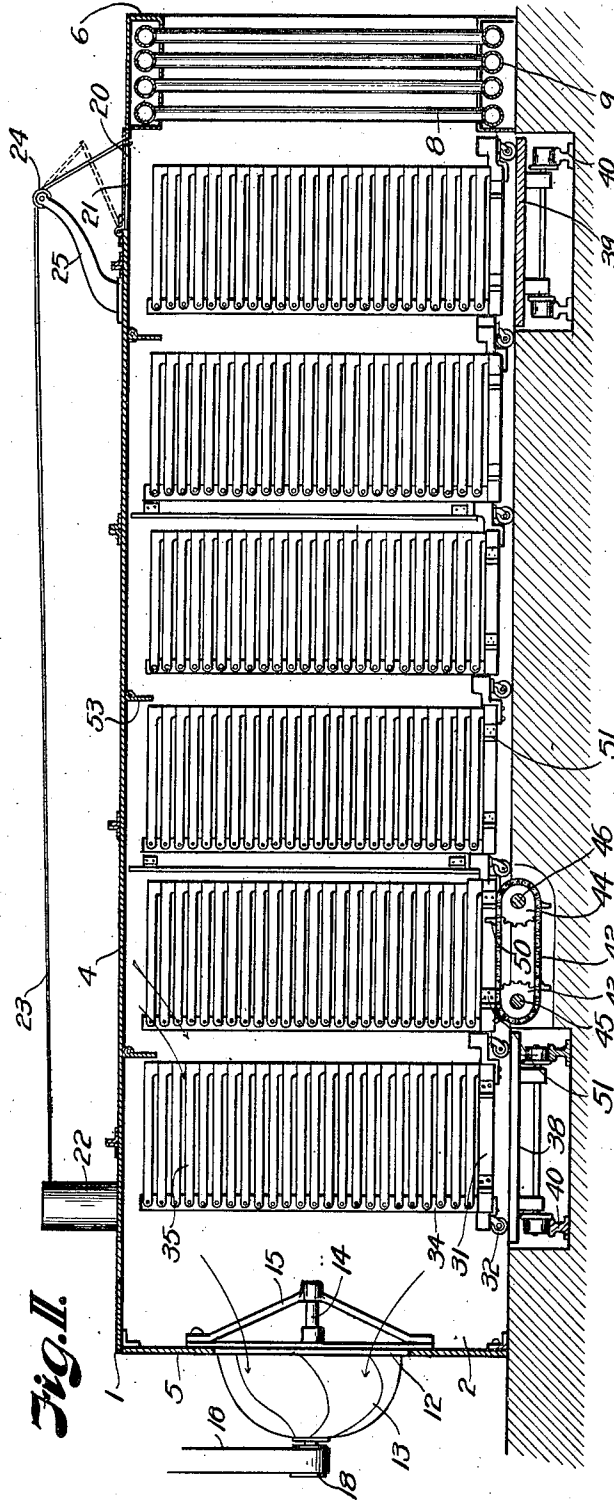
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# UNITED STATES PATENT OFFICE.

JOHN F. HOPE AND ERIC LAMBERT, OF KANSAS CITY, MISSOURI.

PROCESS OF AND APPARATUS FOR DRYING WOOD VENEER OR OTHER SUBSTANCES.

1,353,591.

Specification of Letters Patent. Patented Sept. 21, 1920.

Application filed November 29, 1915. Serial No. 63,975.

*To all whom it may concern:*

Be it known that we, JOHN F. HOPE and ERIC LAMBERT, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Processes of and Apparatus for Drying Wood Veneer or other Substances; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to a process of and apparatus for drying wood veneer or other substances that cannot be subjected to high temperatures or baking heats without injury, and has for its object to dry the veneer or other substance in a manner that will draw moisture therefrom evenly and without case hardening, checking or splitting.

More particularly the drying is effected by drawing large quantities of air properly tempered and under partial vacuum through the substance to be dried, to draw the moisture from the interior to the surface of the substance by vacuum, so that the surface remains moist until the interior is dried, and then carries off the moisture in the current of air that flows about the substance.

In accomplishing these and other objects of the invention we have provided improved details of structure, the preferred forms of which are hereinafter described and are illustrated in the accompanying drawings, wherein:

Figure I is a perspective view of a kiln constructed according to our invention, a part of the inclosing wall being broken away to disclose the drying racks.

Fig. II is a longitudinal, vertical section of the same.

Fig. III is a plan view of a part of the kiln, particularly illustrating the rack shifting mechanism.

Fig. IV is an end elevation of a part of one of the drying racks, particularly illustrating the interlocking arms.

Referring more in detail to the drawings:—

1 designates a kiln housing which is pref-

erably formed of sheet metal and comprises side walls 2—3, a top 4 and ends 5—6.

In one end of the kiln, here shown to be the end 6, is an opening 7, and located within said opening is a radiator 8, comprising a plurality of closely spaced pipes, all of which are connected, through heads 9, with a pipe 10 which leads to a steam or other heating fluid supply source (not shown).

At the opposite end of the kiln is an opening 12 within which is located an exhaust fan 13, the shaft 14 of which is rev- olubly supported in brackets 15 on the housing and driven by any suitable means, here shown to be a belt 16 which runs over a pulley 18 on the fan shaft, to revolve the fan so as to remove exhaust air from the kiln, the discharged air being replaced within the kiln by a fresh supply which is drawn through the radiator 8 and, there- fore, enters the kiln in a heated condition, and the fan being of such capacity that it maintains a partial vacuum within the hous- ing when in operation.

At the delivery end of the kiln housing, adjacent the radiator 8, is an opening 20 which extends across the top 4 and is pro- vided with a hinged cover 21, and located at the opposite end of the kiln is a thermostatic regulator 22, the action of which is governed by the temperature within the kiln. Con- nected with the thermostat is a cable 23 which leads forwardly over a pulley 24 on a bracket arm 25 that is secured to the hous- ing and is fastened to the opening edge of the cover 21; the operation of the thermo- stat being such that when a predetermined temperature is reached within the kiln the cable is drawn to lift the cover and expose the opening 20 so that air may be drawn therethrough, instead of through the radi- ator opening. As the air that passes through the opening 20 does not pass through the radiator, it will be of a lower temperature and will, consequently, lower the tempera- ture within the kiln.

When the temperature has been suffi- ciently lowered by the inflow of cool air through the opening 20, the cable is again automatically let out, allowing the lid 21 to partly or entirely close in order to main- tain the required temperature within the kiln.

At one side of the kiln, adjacent the ends, are intake and discharging openings 26—27, provided with doors 28—29 respectively, through which the material to be dried is delivered to and removed from the kiln.

In order that a maximum amount of material may be dried evenly and quickly we have provided the drying racks 30, each of which comprises a truck 31 that is supported by swivel casters 32, so that the racks may be easily moved about. Rising from near the rear edge of each of the rack trucks are spaced standards 34 and pivotally mounted on said standards are spaced arms 35, provided, at their free ends, with bosses 36 which are adapted for support on successively lower arms to evenly space the arms and retain same in horizontal position, so that one or more sheets of veneer may be supported on each arm independently of the sheets carried by other arms, and thereby avoid the stacking that would be necessary if all of the veneering were supported from the bottom of the rack.

The bosses 36 are also adapted for engaging those on successively higher arms in order to support the arms in elevated position (Fig. IV), it being apparent that when the arms are raised and the upper arm is lowered into the under one, the bosses will engage and hold the arms extended, owing to the fact that the arms are pivoted on different centers.

To facilitate the placing of the racks within the kiln and the removal of the same, we provide cars 38—39 which are adapted for traveling on transverse rails 40 which are set below the level of the kiln floor at the door portions, to bring the car floors on a level with the kiln floor, so that the racks may be easily moved from the car to the kiln floor and vice versa.

As a means of moving the drying rack trucks from the cars and also for moving the trucks through the kiln, we have provided, at each side of the kiln, a conveyer comprising chain belts 42 which run over paired sprocket wheels 43—44 on shafts 45—46 that extend across the kiln adjacent the receiving end, and are driven by a belt 47 that runs over a pulley 48 on the outer end of the shaft 46.

Spaced on the conveyer chains are up-standing teeth 50 which are adapted to engage lugs 51 that are fixed on the ends of the rack trucks; the arrangement being such that when the shaft is rotated by the belt 47 to move the upper part of the chain forwardly or from the receiving toward the delivery end of the kiln, the teeth 50 on the conveyer chains will simultaneously engage lugs 51 at opposite ends of the drying racks and the racks will be moved forwardly a definite distance.

In order that the air currents that are drawn through the kiln may pass between the layers of veneer and avoid the walls of the kiln, we have provided deflecting wings 53 which are hinged at intervals along the side walls and roof of the kiln housing and are adapted for turning air inwardly toward the center of the kiln, the wings being hinged to swing in the direction of travel of the racks, so as not to hinder passage of the racks through the kiln, and for automatic return to functional position under the exhausting air pressure.

Assuming that the kiln is constructed as described, the operation is as follows: A drying rack is placed on the car 38, the veneer is placed on the rack arms and the car moved along the track into the kiln. When within the kiln the rack truck is moved sufficiently to allow the conveyer teeth 50 to catch the lugs 51 at opposite ends of the truck, so that the truck is moved from the car toward the discharge end of the kiln.

Other trucks are then brought up and moved onto the floor of the housing, pushing against the preceding trucks to forward same toward the discharge end of the housing.

During the travel of the racks through the housing the fan is in operation and draws air through the radiator and housing to first heat the air and then dry the veneer, the exhausting of the air, as distinguished from blowing, insuring against travel of the air in channels and resulting in a circulation throughout the entire interior of the kiln, the capacity of the fan being such that it creates a vacuum in the housing that tends to draw moisture out of the veneer or other substance, so that the outer surface is the last to dry and consequently does not case harden, check or split.

During the drying operation the doors may be kept closed except when it is necessary to open them to insert or remove a truck, so that a constant or continuous operation of the kiln may be effected.

It will also be seen that an even temperature may be maintained within the kiln, and, by use of the deflectors, the air currents caused to pass through all parts of the kiln, so that the veneer may be evenly and quickly dried.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters-Patent, is:

1. A drying kiln comprising a housing having openings in its opposite ends and having a transverse opening in its top, a heating unit located in one of the end openings, a fan mounted in the opposite opening, adapted for drawing air through and discharging same from the housing, a cover for said top opening, and a thermostatic regu-

lator for raising or lowering said cover to admit air to the kiln, for the purpose set forth.

2. In a drying kiln, the combination of a  
5 housing having an air intake opening at one end and means at the opposite end of the housing for drawing air through and discharging the same from the housing, racks  
10 movable through the housing in the direction of the intake opening, and wings hingedly mounted on a wall of the housing and yieldable in the direction of travel of  
15 said racks for deflecting air to the racks, and adapted for yielding when engaged by the racks to permit the racks to travel.

3. A drying kiln comprising a housing

having an intake at one end and a discharge opening at the opposite end, a fan located adjacent the discharge opening for drawing air through the housing, racks movable 20 through the housing in the direction of the intake opening, and wings pivotally mounted on the top of the housing and depending into the path of the racks, whereby the wings may yield when engaged by the racks 25 and automatically return to their functional positions, for the purpose set forth.

In testimony whereof we affix our signatures.

JOHN F. HOPE.  
ERIC LAMBERT.