Sept. 16, 1924. 1,508,924

W. H. COLLIER ET AL

DRIER FOR SHEET MATERIAL

Filed July 31, 1922 3 Sheets-Sheet 1

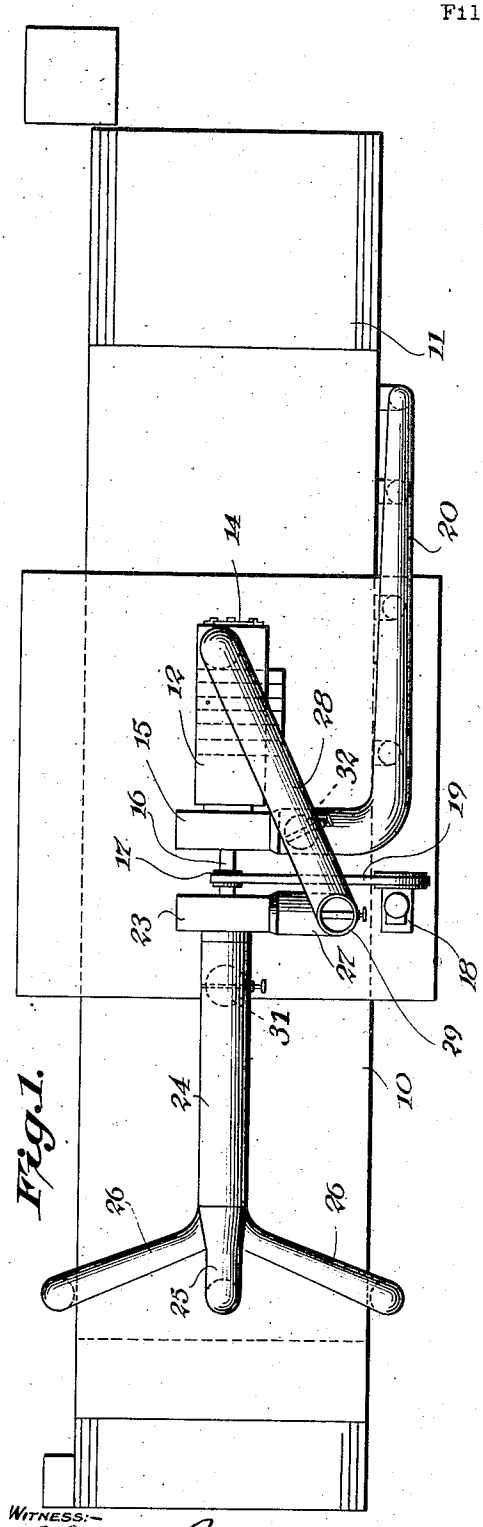


Fig. 1.

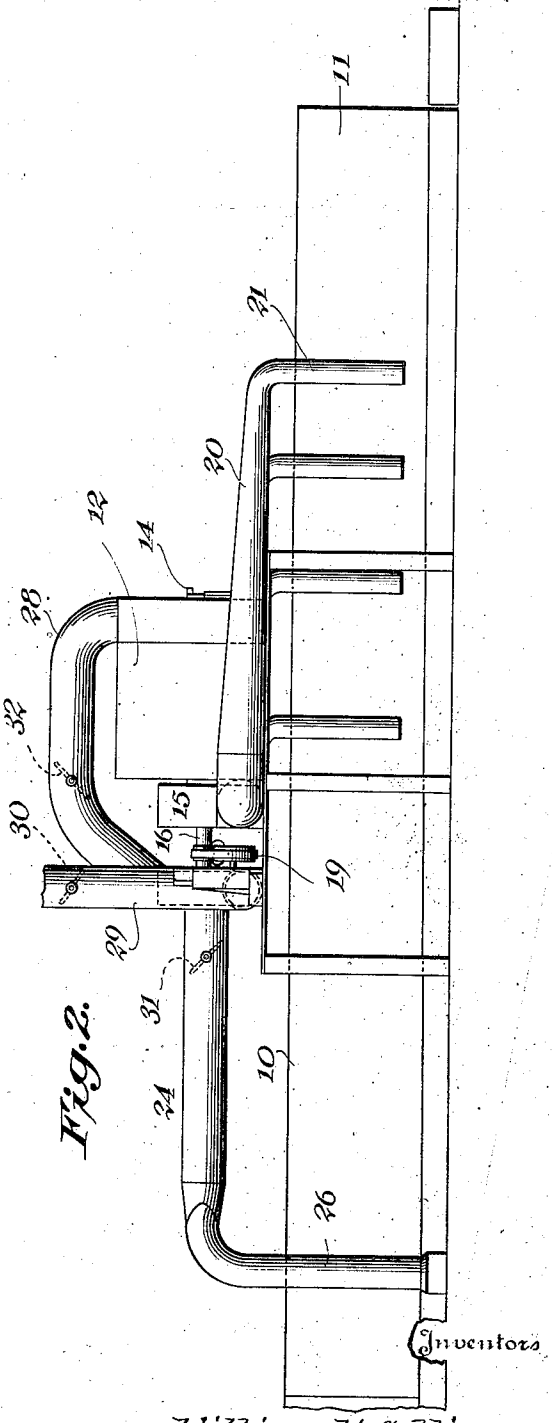


Fig. 2.

Witness:-
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DRIER FOR SHEET MATERIAL

Filed July 31, 1922 3 Sheets-Sheet 2

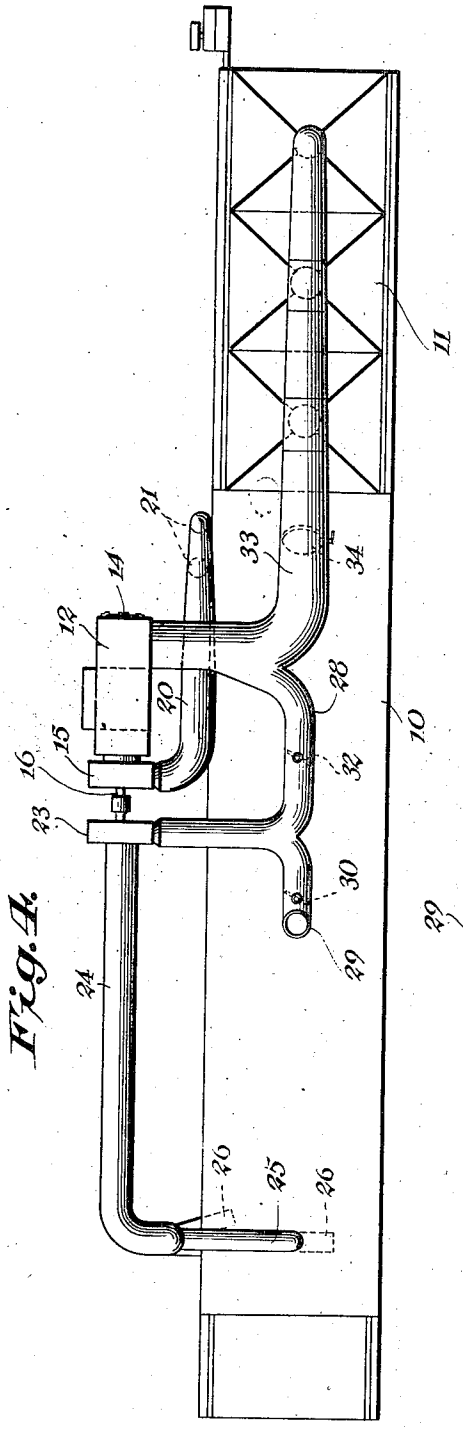


Fig. 4.

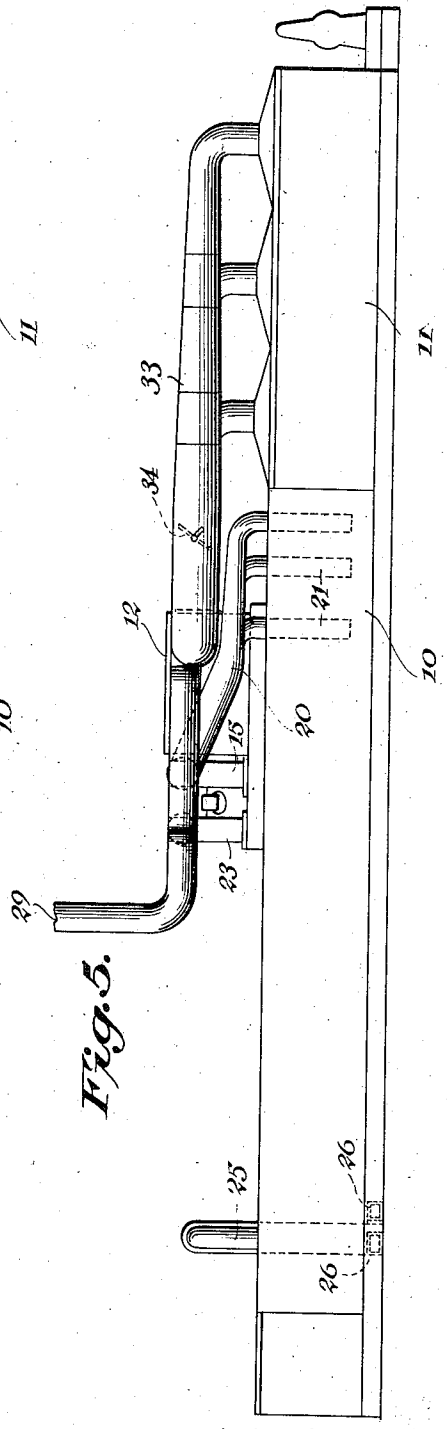


Fig. 5.

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DRIER FOR SHEET MATERIAL

Filed July 31, 1922 3 Sheets-Sheet 3

Fig. 3.

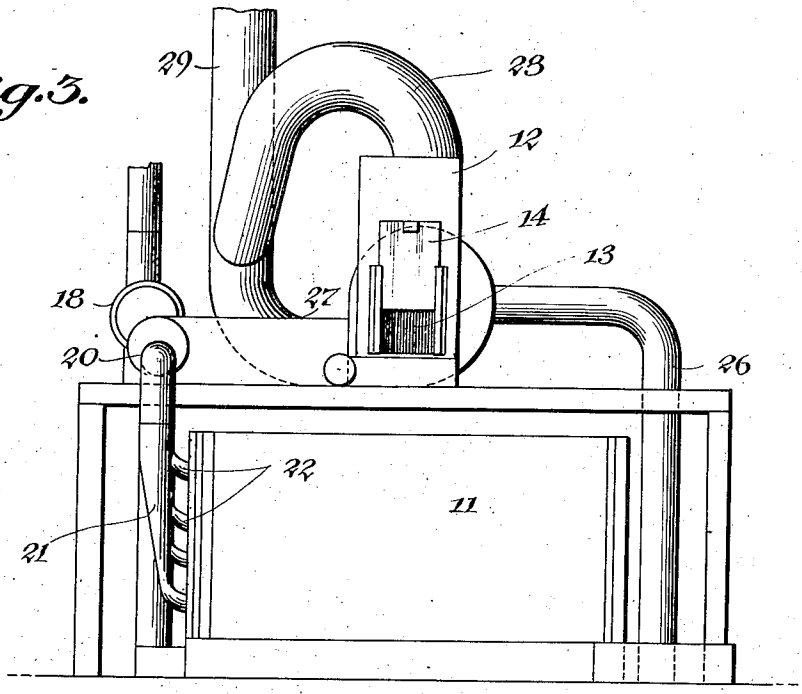
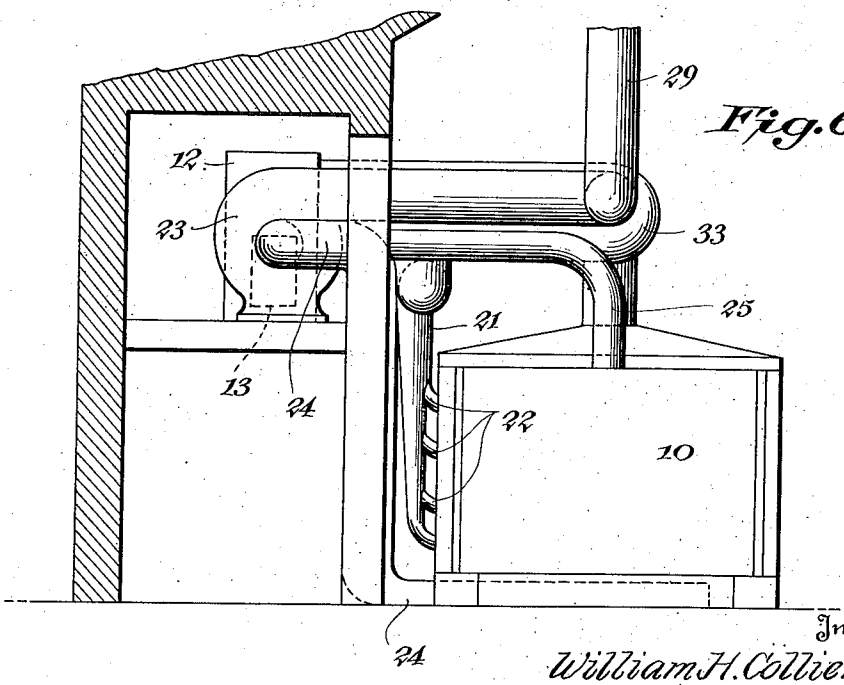


Fig. 6.



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Chas. L. Riesenauer

Patented Sept. 16, 1924. 1,508,924

UNITED STATES PATENT OFFICE.

WILLIAM H. COLLIER AND ARTHUR J. VANCE, OF PAINESVILLE, OHIO.

DRIER FOR SHEET MATERIAL.

Application filed July 31, 1922. Serial No. 578,769.

To all whom it may concern:

Be it known that we, WILLIAM H. COLLIER and ARTHUR J. VANCE, citizens of the United States, residing at Painesville, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Driers for Sheet Material, of which the following is a specification.

This invention relates to driers of what is known as the "progressive type" wherein the material to be dried is passed through a long drying chamber, being entered at one end in a green or undried state and delivered at the other end in a dried condition. More particularly the invention relates to driers used for drying thin sheet material such as veneers, wall board and other like products, the device being preferably known as a "veneer drier" although not confined in its use to veneers alone.

The successful drying of veneers is dependent principally on the three factors of circulation of the drying medium (dry or moist air); heat and its distribution and control in the drying chamber, and moisture and is distribution and control. In addition to these economy in the use of heat is also an important factor in attaining commercial success.

The present invention confines itself principally to the circulating, heat distributing and economical factors and its principal objects are to provide an improved form of dryer, the general type of which is shown in the copending application for patent filed by William H. Collier and Arthur J. Vance on the 31st day of July 1922, and bearing the Serial No. 578,768 wherein provision is made for obtaining a highly efficient utilization of drying air, and for the conservation of the heat in such air and its adaptation to the treatment by drying of veneers and the like of widely varying characteristics, such as are controlled by the structure and moisture content.

The invention will now be described with reference to the accompanying drawings and the novel features will then be specifically claimed.

In said drawings:

Figure 1 is a plan view of a drier embodying the improved features of this invention.

Figure 2 is a side elevation thereof.

Figure 3 is an end view of such a drier.

Figure 4 is a plan view of a modified form of the invention.

Figure 5 is a side elevation of the modified form.

Figure 6 is an end view of the modification.

In illustrating the present invention the exterior only of the drying and cooling chambers have been shown and the drying chamber is indicated in general at 10 and the cooling chamber at 11 in both of the forms which are here shown. In the form shown in Figures 1, 2, and 3 it will be seen that there is provided a heating chamber 12 receiving fresh air through a door 13 governed by the usual slide 14. This heating chamber communicates with the intake of a blower fan 15 having a shaft 16 whereon is mounted a belt pulley 17. At 18 is a blower engine connected by a belt 19 with the pulley 17. From the blower fan extends a supply pipe 20 which runs along one side of the chamber 10 and is provided with downwardly extending branches 21 communicating at intervals with the chamber through branch pipes 22. It will be noted that the air from these branch pipes 22 enters the drying chamber at the delivery or dry end thereof.

At 23 is a suction fan, the shaft 16 serving as the shaft for this fan also. A suction pipe 24 communicates with the intake of this fan and is provided with a branch 25 opening into the top of the chamber 10 at the wet or intake end thereof. Lateral branches 26 are also provided from the pipe 24 and these lateral branches extend downward along the sides of the chamber 10 and communicate with the bottom thereof. It is found, in most cases, advisable to so proportion these branches that one third of the exhaust moist air is drawn off at the top and the remaining two thirds at the bottom. Extending from the fan 23 is a delivery pipe 27 which has a recirculating duct 28 connected thereto and leading to the intake end of the heating chamber 12. An exhaust pipe 29 also connects to the pipe 27 and in the exhaust pipe is a valve 30. A valve 31 is provided in the pipe 24 and a valve 32 in the duct 28. By means of this arrangement the distribution of the drying air can be regulated as desired. For instance, by opening the slide 14 and valves 30 and 31 and closing the valve 32 fresh air at atmospheric

temperature may be passed through the heater and into the dry end of the dryer from whence it will pass to the wet end and be drawn out and discharged through the exhaust pipe 29. In other cases the valve 30 and slide 14 may be closed and the valve 32 opened. With this arrangement a continuous circulation of air will be maintained, no fresh air being admitted. It is obvious that by adjusting the various valves any condition between a complete fresh air supply and a complete recirculation can be obtained.

The form of the device shown in Figures 4, 5, and 6 is substantially the same as that previously shown and described except that the cooling end section 11 is provided with a cover and a pipe 33 connected at intervals to said cover, leads back and joins pipe 28 so that warm air from the cooling section may be conducted back to the heater 12 to be reheated. When it is desired to thus withdraw the warm air from the section 11, the valve 34 is timed to open position and the air will then be drawn through the pipe 33 by the suction of the fan 15.

It will be seen that by utilizing the warm air for recirculating, great economy is obtained in the use of heat and the conditions as to moisture and circulation in the dryer can be regulated with great exactness.

Having thus described the invention, what is claimed as new, is:—

1. The combination with a drying chamber having a supply or wet end and delivery or dry end; of means to supply heated fresh air to the dry end of said chamber, other means to draw off the air from the wet end of the chamber including a suction fan and suction pipes connecting said fan with the top and lower side portions of the wet end of the chamber, and a recirculating duct connecting said fan with the first means.

2. The combination with a drying chamber having a supply or wet end and a delivery or dry end; of means to supply heated fresh air to the dry end of said chamber, other means to draw off the air from the wet end of the chamber including a suction fan and suction pipes connecting said fan with the top and lower side portions of the wet end of the chamber, a recirculating duct connecting said fan with the first means, an exhaust from said duct, and valves controlling the exhaust and duct and thereby regulating the proportion of the recirculated air and fresh air.

3. In combination with a drying chamber having a supply or wet end and a delivery or dry end; means to supply heated fresh air to the dry end of said chamber including a heater chamber and a blower fan receiving air therefrom and having pipe connection with said dry end, other means to draw off air from the wet end of said chamber, and a duct connecting the last mentioned means with the heater chamber, an exhaust from said duct, valves controlling the exhaust and duct and thereby regulating the proportion of the recirculated air and fresh air, a cooling chamber at the dry end of said drying chamber, and piping connecting said cooling chamber with the heater chamber, whereby the air may be withdrawn from the cooling chamber and delivered to the heater to be reheated.

In testimony whereof we affix our signatures.

WILLIAM H. COLLIER.
ARTHUR J. VANCE.