

April 13, 1954

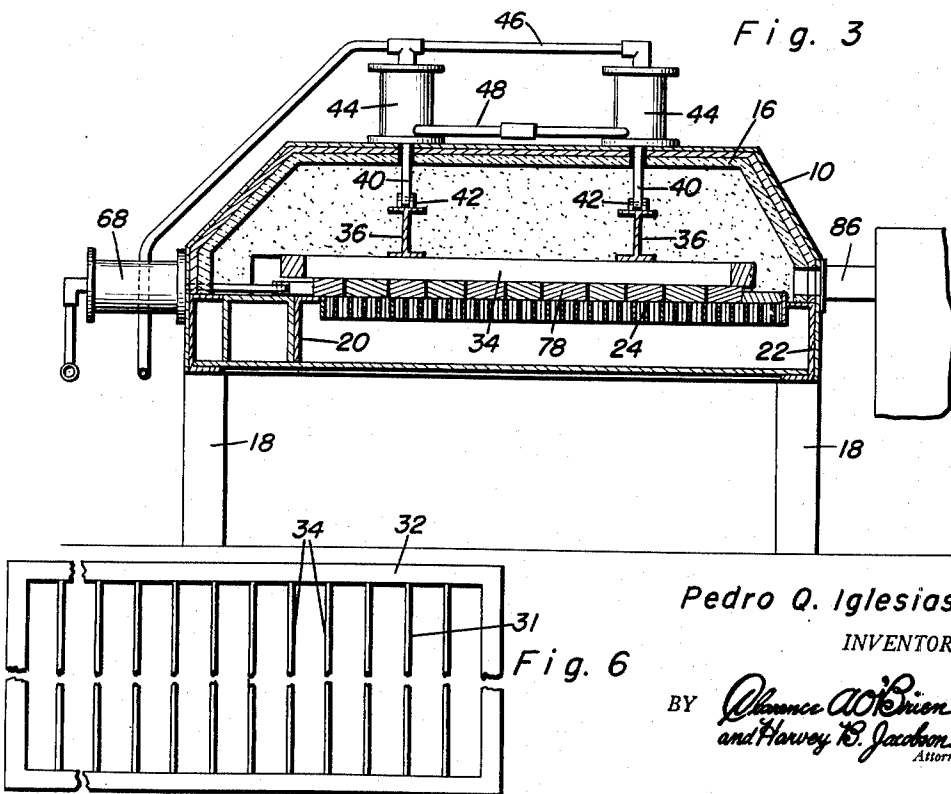
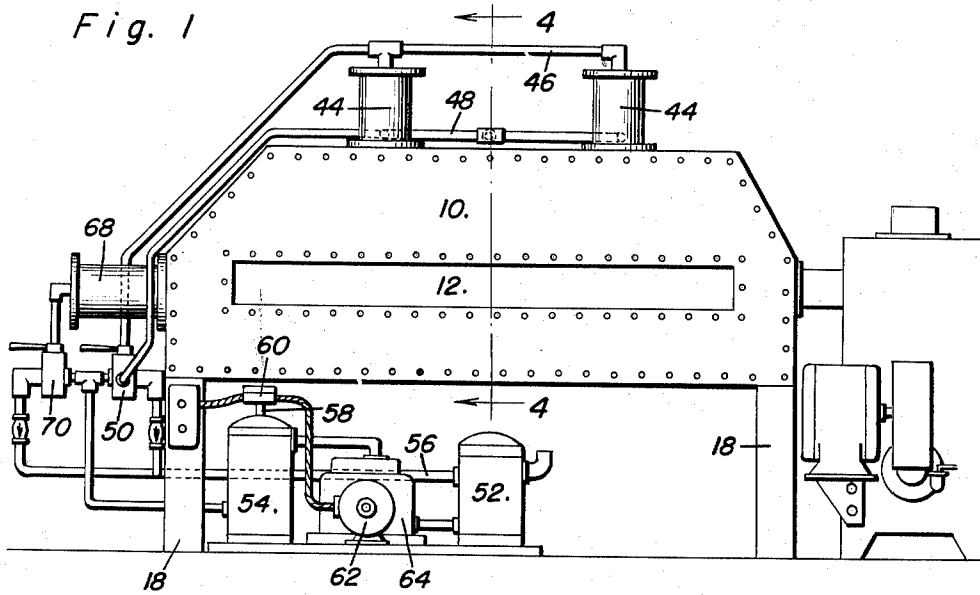
P. Q. IGLESIAS

2,675,037

HYDRAULIC PRESS FOR LAMINATING WOOD

Filed March 19, 1953

3 Sheets-Sheet 1



Pedro Q. Iglesias
INVENTOR.

BY *Oliver A. O'Brien*
and *Harvey R. Jacobson*
Attorneys

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P. Q. IGLESIAS

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3 Sheets-Sheet 2

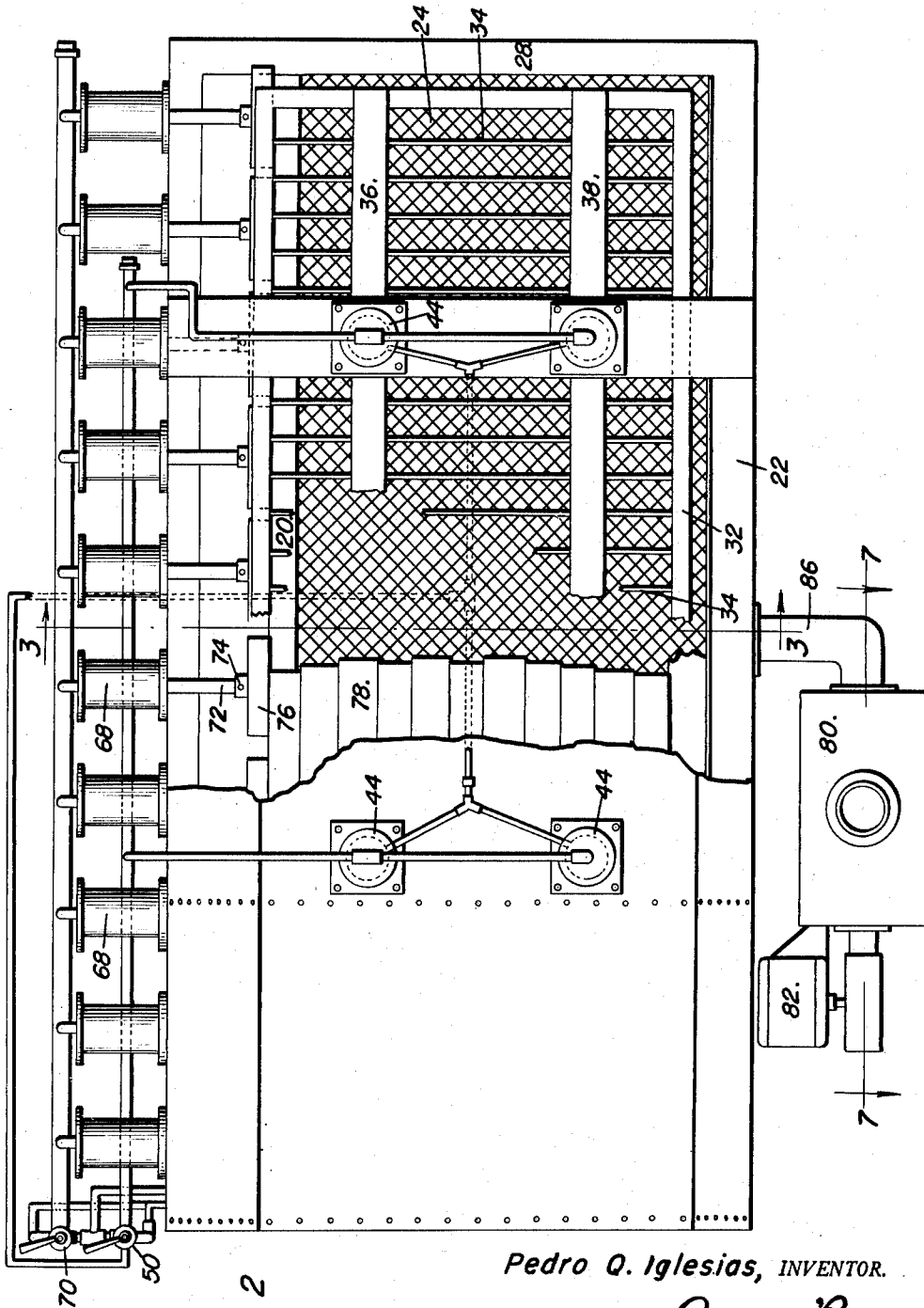


Fig. 2

Pedro Q. Iglesias, INVENTOR.

BY *Alfonso A. Orion*
and Harvey B. Jackson
Attorneys

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P. Q. IGLESIAS

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3 Sheets-Sheet 3

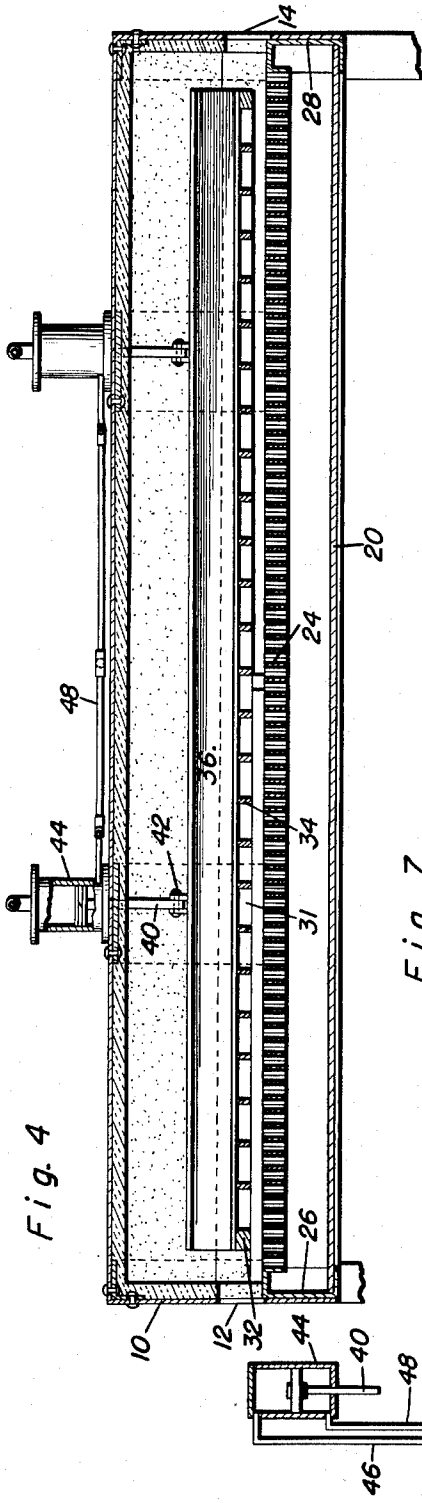


Fig. 4

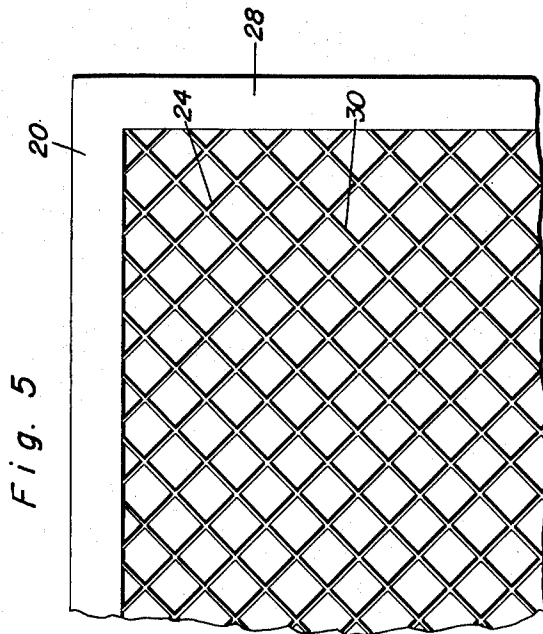


Fig. 5

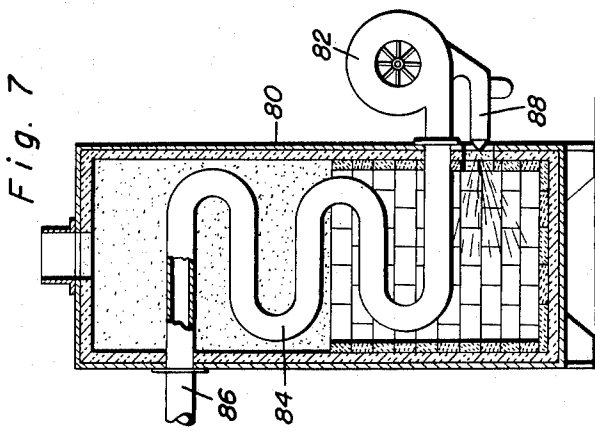


Fig. 7

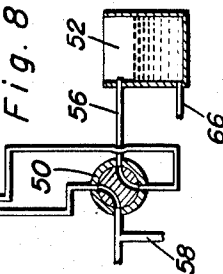


Fig. 8

Pedro Q. Iglesias
INVENTOR.

BY *Albance A. O'Brien*
and Harvey R. Jacobson
Attorneys

UNITED STATES PATENT OFFICE

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HYDRAULIC PRESS FOR LAMINATING WOOD

Pedro Q. Iglesias, Jaurez, Chihuahua, Mexico

Application March 19, 1953, Serial No. 343,281

5 Claims. (Cl. 144—281)

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This invention relates to a hydraulic press for laminating wood and joining small pieces of wood to form a composite lumber product of superior quality.

This invention features the concept of providing a machine for forming composite lumber products which employs hydraulic means for pressing small pieces of wood together. Heat is supplied by blowing heated air into circulation about an upper and lower broiler so that the heated air may pass directly into engagement with the wood to dry any glue or other adhesive used in bonding the pieces of wood.

A furnace is provided for heating air which employs liquid fuel thus eliminating the necessity of large amounts of electrical energy which besides being expensive is also comparatively dangerous and when unshielded causes considerable interference in radio communications and in other high frequency broadcast.

The primary purpose of the invention is to utilize lumber waste in factories and lumber mills which is usually burned or otherwise disposed of without realization thereon. Comparatively large flat sheets of wood may easily be formed using this waste. Thus, a reduction in the amount of lumber used may result from the utilization of machines constructed in accordance with this invention which will preserve forests. Furthermore, the product produced by this machine is a highly desirable commodity which is superior in many respects to other wood products.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this hydraulic press for laminating and joining wood, a preferred embodiment of which has been illustrated in the accompanying drawings by way of example only, wherein:

Figure 1 is a front elevational view of the machine comprising the present invention;

Figure 2 is a top plan view of this machine with parts being shown in section for a greater detail;

Figure 3 is a vertical sectional view as taken along the plane of line 3—3 in Figure 2, showing the construction of the upper and lower broilers and further illustrating the means in which heated air is circulated about the lumber under treatment;

Figure 4 is a vertical sectional detail view as taken along the plane of line 4—4 of Figure 1, illustrating the construction of the broilers and also illustrating the means for raising and lowering the upper broiler in greatest detail;

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Figure 5 is an enlarged detail view of a portion of the lower broiler;

Figure 6 is a plan view illustrating the construction of a portion of the upper broiler;

Figure 7 is a sectional detail view illustrating the furnace and broiler used for supplying heated air to the machine; and

Figure 8 is a diagram illustrating the hydraulic means for raising or lowering the broiler.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates a housing having a suitable configuration and being provided with an inlet mouth 12 and a discharge aperture 14 at the opposite end thereof. The housing 10 is preferably formed from sheet metal and has an insulative layer 16 of asbestos or the like secured to the inner surfaces thereof. The housing 10 may be mounted on legs 18 and is provided with a lower broiler supporting structure including longitudinal strength members 20 and 22 which are adapted to rigidly support the lower broiler 24. The lower boiler 24 includes a peripheral framework formed by the beams 20 and 22 and by the transverse strength members 26 and 28, and is provided with a grill 30 formed from a mesh of criss-crossing plates which are of substantially greater dimensions with respect to their depth than the width thereof. The lower broiler 24 is therefore of relatively rigid structure which readily permits the circulation of air there-through. Supported above the lower broiler 24 is an upper broiler 30 which includes a peripheral framework 32 having a plurality of battens 34 extending in spaced parallel relationship. Secured to the battens 34 and to the peripheral framework are a pair of I beams 36 and 38 which extend perpendicularly to the battens 34 and which substantially rigidify the entire upper broiler 30. For raising and lowering the upper broiler 30, there are provided piston rods 40 which are threadedly adjustably secured within brackets 42 attached to the I beams 36 and 38. These piston rods 40 are attached to double acting pistons within cylinders 44 mounted on the housing 10. These pistons are actuated by hydraulic pressure entering through conduits as at 46 and 48 connecting the cylinders 44 with a four-way valve 50 which connects the conduits with a reservoir 52 and a pressure tank through conduits 56 and 58 respectively. The pressure on the fluid in the hydraulic tank 54 is controlled by a pressure regulator 60 of conventional design which actuates the motor 62 of a pump 64

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connected by conduit 66 to the reservoir 52. Hence, upon actuation of the valve 50, movement of the upper broiler 30 can be controlled.

Mounted on the side of the housing 10 are a plurality of cylinders 68 which are connected through valve 70 to the pressure tank 54 and the reservoir 52 by means of suitable conduits. Within the cylinders 68 there are pistons which actuate piston rods 72 having pivotally attached thereto by means of pins 74 individual shoes 76 which are adapted to engage strips or pieces of lumber 78 which are positioned within the housing 10 through the mouth 12. These strips 78 are preferably partially or completely coated with a suitable adhesive for bonding these strips with other strips to form a composite wood product. Upon opening of the switch 70, fluid will flow into the cylinders 68 under pressure thus effectively actuating the pistons to apply pressure horizontally against the wood pieces 78 pressing them together. Likewise, the upper broiler 31 will be pressed downwardly due to actuation of the piston rods 40 further applying pressure on the wood pieces.

It has been found that the drying action of the adhesive and the bonding thereby of the strips of wood can be accelerated by the circulation of heated air within the housing 10. There is therefore provided a furnace 80 having a blower 82 mounted thereon which drives hot air through a serpentine conduit 84 mounted within the furnace 80. This heats the air within the conduit 84, once it is transmitted through a pipe 86 and into the housing 10. A liquid fuel injection system including injectors 88 are provided for the furnace 80. Thus, there is eliminated the necessity for electric heating means and other electrical equipment which if applied to an apparatus of this type would usually result in severe and costly accidents and breakdowns.

Once the furnace 80 has been in operation long enough to supply heated air, the lumber is introduced into the housing 10 coated with the proper adhesive through the mouth 12. The valves 50 and 70 are open to apply pressure both horizontally and vertically on the adjacent strips of wood. After treatment within the housing 10 for the required period of time, the valves 50 and 70 may be opened and the composite wood product is pushed out by inserting additional strips of wood. It is to be understood that if it is desired, the cylinders 68 may be provided with double acting pistons or if found feasible, the upper broiler may be lifted by other means than the hydraulic means employed in conjunction with the blower applying the pressure. A distinct advantage of the hydraulic means for applying pressure is that there is considerable pressure applied but of a uniform and continuous nature.

Since from the foregoing the construction and advantages of this hydraulic press for laminating wood are readily apparent, further description is believed to be unnecessary.

However, since numerous modifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the precise embodiment shown and described, but all suitable modifications and equivalents may readily be resorted to which fall within the scope of the appended claims.

What is claimed as new is as follows:

1. A hydraulic press for laminating wood, 75

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comprising a housing, a lower broiler plate rigidly mounted in said housing, an upper broiler plate, means for raising, lowering, and applying downward pressure on said upper broiler plate, means for applying horizontal pressure on wood supported by said lower broiler plate, and means for introducing heated air to said housing, said upper broiler plate including a peripheral frame, battens secured to said frame flush with the bottom edge thereof, and cross beams overlying, and extending perpendicularly to and secured to said battens.

2. A hydraulic press for laminating wood, comprising a housing, a lower broiler plate rigidly mounted in said housing, an upper broiler plate, means for raising, lowering, and applying downward pressure on said upper broiler plate, means for applying horizontal pressure on wood supported by said lower broiler plate, and means for introducing heated air to said housing, said upper broiler plate including a peripheral frame, battens secured to said frame flush with the bottom edge thereof, and cross beams overlying, and extending perpendicularly to and secured to said battens, said means for raising and lowering and applying pressure to said upper broiler including hydraulically actuated pistons secured to said beams.

3. A hydraulic press for laminating wood, comprising a housing, a lower broiler plate rigidly mounted in said housing, an upper broiler plate, means for raising, lowering, and applying downward pressure on said upper broiler plate, means for applying horizontal pressure on wood supported by said lower broiler plate, and means for introducing heated air to said housing, said lower broiler plate comprising a relatively rigid structure having a grill arrangement for permitting passage of heated air therethrough, said upper broiler plate including a peripheral frame, battens secured to said frame flush with the bottom edge thereof, and cross beams overlying, and extending perpendicularly to and secured to said battens.

4. A hydraulic press for laminating wood, comprising a housing, a lower broiler plate rigidly mounted in said housing, an upper broiler plate, means for raising, lowering, and applying downward pressure on said upper broiler plate, means for applying horizontal pressure on wood supported by said lower broiler plate, and means for introducing heated air to said housing, said lower broiler plate comprising a relatively rigid structure having a grill arrangement for permitting passage of heated air therethrough, said upper broiler plate including a peripheral frame, battens secured to said frame flush with the bottom edge thereof, and cross beams overlying and extending perpendicularly to and secured to said battens, said means for raising, lowering, and applying pressure to said upper broiler including hydraulically actuated pistons secured to said beams.

5. A hydraulic press for laminating wood, comprising a housing, a lower broiler plate rigidly mounted in said housing, an upper broiler plate, means for raising, lowering, and applying downward pressure on said upper broiler plate, means for applying horizontal pressure on wood supported by said lower broiler plate, and means for introducing heated air to said housing, said lower broiler plate comprising a relatively rigid structure having a grill arrangement for permitting passage of heated air therethrough, said upper

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broiler plate including a peripheral frame, battens secured to said frame flush with the bottom edge thereof, and cross beams overlying and extending perpendicularly to and secured to said battens, said means for raising, lowering, and applying pressure to said upper broiler including hydraulically actuated pistons secured to said beams, said means for applying horizontal pressure including a plurality of hydraulically operated pistons having individual shoes pivotally secured thereto.

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