Aug. 9, 1932. E. G. LACEY 1,870,517

VENEER PRESS

Filed Oct. 14, 1930 2 Sheets-Sheet 1

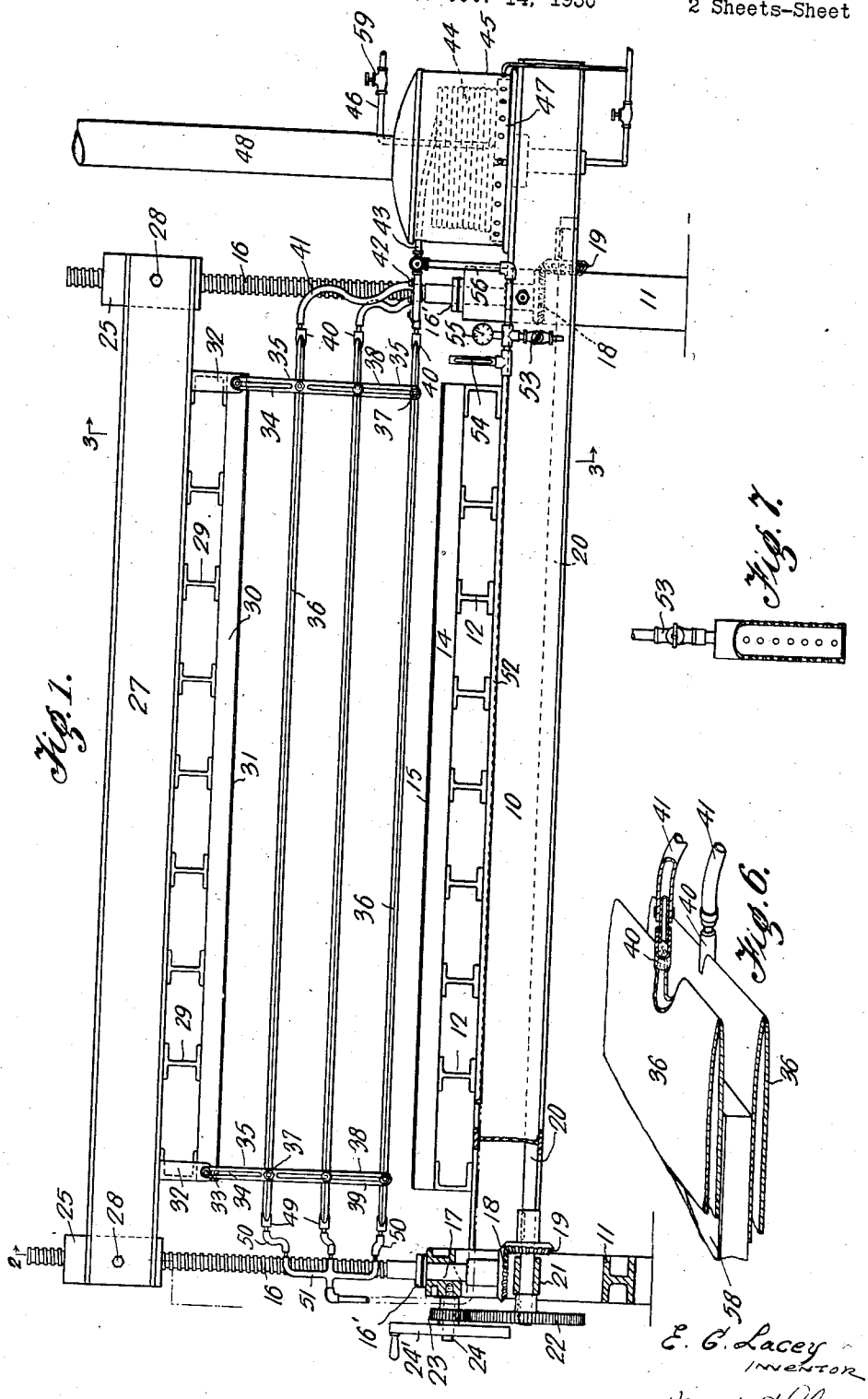


Fig. 1.

Fig. 7.

Fig. 6.

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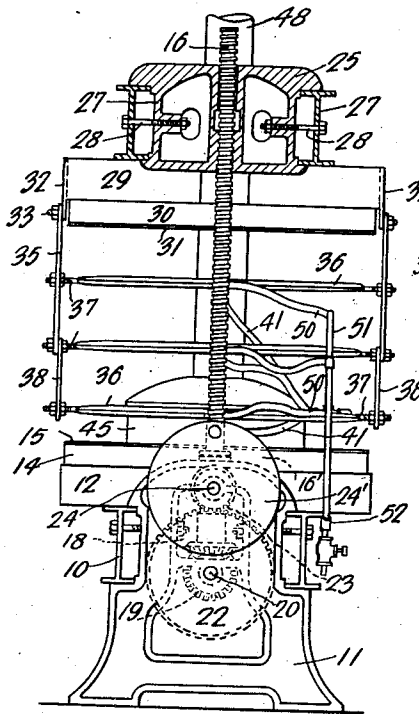


Fig. 2.

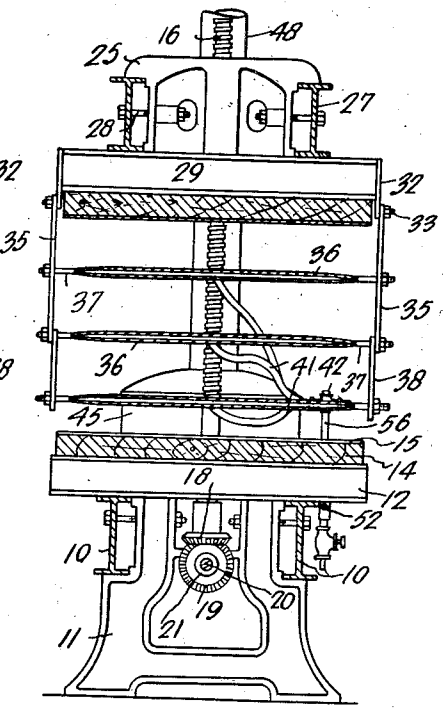


Fig. 3.

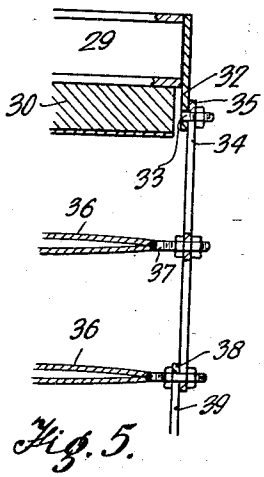


Fig. 5.

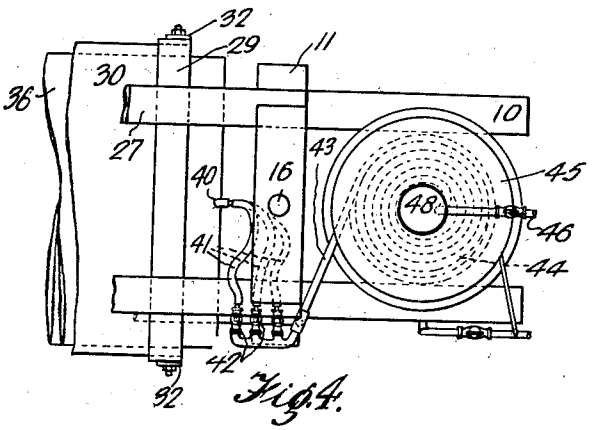


Fig. 4.

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Patented Aug. 9, 1932

1,870,517

UNITED STATES PATENT OFFICE

ERNEST GEORGE LACEY, OF ABBOTSFORD, VICTORIA, AUSTRALIA

VENEER PRESS

Application filed October 14, 1930, Serial No. 488,623, and in Australia November 22, 1929.

This invention relates to improvements in and connected with veneer presses and refers especially to presses for use in applying veneers such as thin pieces of wood of superior quality to the surfaces of members of wood or other material.

Veneers are applied to the surfaces of such members by means of glue or cement, and, in order to ensure a satisfactory junction between the veneer and the material to which it is applied, it is customary to apply pressure to the surface of the veneer and to subject it to heat whereby the glue will be maintained in a liquid condition until the junction is effected.

Various types of presses have previously been used and suggested for applying pressure and heat to the work and, in some cases, a plurality of hollow rigid cauls have been disposed between parallelly arranged rigid plates adapted to be adjusted towards and from each other, so that the requisite pressure could be applied to work placed in the compartments formed by adjacent caul plates. A heated fluid is passed through the caul plates to maintain the work at a desired temperature.

I am also aware that rubber bags and diaphragms of rubber and thin metal plates have previously been proposed for use in the application of veneers, a pressure fluid being delivered to the bags or into chambers behind the diaphragms so that the flexible material would accommodate itself to the surface of an article in contact therewith.

In some cases the pressure fluid has been heated in order to maintain the glue in a liquid condition when pressure is first applied to the articles.

The object of this invention is to provide an improved veneer press by means of which pressure and heat may be applied uniformly and expeditiously to articles to be treated.

The invention briefly consists in providing a veneer press having parallelly disposed fixed and adjustable plates, an intermediately disposed shallow flexible envelope the opposed faces of which are directed towards the fixed and adjustable plates and arranged to impart a yielding pressure to adjacent pieces of work, and means for supplying a heated fluid under pressure to the envelope.

The envelope is preferably constructed of a pair of cambered metal sheets joined at their edges and is relatively inextensible laterally—that is in a direction approximately parallel to the operative faces of the envelope.

In the preferred construction according to this invention, the adjustable plate is arranged horizontally and above the fixed plate and a plurality of shallow flexible envelopes as above mentioned are supported from the top plate in spaced relationship to form compartments for the reception of the work.

Hot water under pressure is circulated through the envelopes to keep the glue in a liquid condition until the veneer is pressed firmly against the article to which it is to be attached, and means are provided for throttling the discharge of the water in order to control the pressure within the envelopes.

Having set forth the object and nature of the invention, reference will be made to the accompanying explanatory drawings wherein:—

Figure 1 is a view in elevation partly in section of a veneer press constructed in accordance with the invention.

Figure 2 is a view in end elevation of the press shown in Figure 1.

Figure 3 is a view in sectional end elevation taken on the line 3—3 of Figure 1.

Figure 4 is a view in plan of the right hand end of the press shown in Figure 1.

Figure 5 is a detail view showing means for adjustably supporting the envelopes;

Figure 6 is a view in perspective, partly in section, of portions of an adjacent pair of envelopes; and

Figure 7 is a view showing a device for indicating the rate of discharge of the fluid from the envelopes.

Referring to the drawings, the reference numeral 10 designates a pair of parallel longitudinally disposed beams forming the base of the machine and which are supported adjacent their ends on suitably formed standards 11.

A plurality of equally spaced transverse beams 12 of I section are supported on the

upper surfaces of the beams 10 and these transverse beams in turn support a fixed plate comprising a wooden deck 14 which is preferably provided on its upper surface with a lining 15 of sheet metal.

A pair of vertical screw shafts 16 are rotatively mounted in bearings 17 formed integrally with the standards 11 and the lower ends thereof are fitted with bevel pinions 18 meshing with pinions 19 secured to a longitudinally disposed shaft 20 rotatively supported in bearings 21 also formed integrally with the said standards.

The screw shafts 16 are supported on the standards by means of thrust bearings 16'.

A gear 22 provided at one end of the horizontal shaft 20 is in constant mesh with a pinion 23 rotatively mounted on an axle 24 projecting laterally from the respective standard 11.

A crank disc 24' is rigidly associated with the pinion 23 and is provided with a crank handle whereby an operator may readily rotate both of the screw shafts 16 in unison.

It will be apparent that an electric motor may be provided for rotating the shaft 20 or that same may be provided with a clutch whereby it may be operated from any convenient source of power.

A crosshead 25 is mounted on each of the screwthreaded vertical shafts 16, the lower portions of central holes therein being screw threaded to accommodate the said shafts.

The crossheads are suitably shaped to support the ends of a pair of horizontally aligned longitudinal beams 27 which are secured in position by means of bolts 28.

A plurality of spaced transverse beams 29 are secured below the beams 27 and same support a top plate comprising a wooden deck 30 which is preferably provided on its lower face with a sheet metal lining 31.

It will be apparent that the top plate may be adjusted to and from the bed by the rotation of the screw shafts 16 by means of the longitudinal shaft 20.

End plates 32 are secured to the ends of the beams 29 disposed at opposite ends of the top plate and same are fitted with laterally disposed pins 33 accommodated in slots 34 formed in links 35 for supporting the upper pair of a plurality of flexible envelopes 36.

The envelopes 36 are preferably constructed of thin metal sheets about 1/8" in thickness, and are disposed horizontally between and correspond in size and shape to, the top plate and base of the press.

These envelopes preferably are of slightly convex formation both in longitudinal and transverse cross sections whereby normally the maximum thickness occurs at the center.

The envelopes are provided on each of their longitudinal edges with a pair of laterally projecting pins 37 which are located adjacent to the opposite ends thereof, and the pins on the upper envelope engage centrally disposed holes in the supporting links, 35. The lower ends of the links 35 are also slotted to receive the pins 37 on the intermediate envelope whilst the lower envelope is supported by means of links 38 fitted at their upper ends to the pins 37 on the intermediate envelope, and provided with slots 39 accommodating the pins 37 on the lower envelope (Figure 5).

It will thus be understood that the envelopes are free to move to and from each other to a predetermined extent.

It will be apparent that any number of envelopes may be supported in this way between the top and bottom plates of the press and that same may be adjustably supported in any other approved manner.

The right hand ends of the envelopes (Figures 1 and 6) are fitted with inlet pipes 40 to which are connected the ends of flexible tubes 41 communicating at their opposite ends with individual cocks 42 on a common supply pipe 43.

The supply pipe 43 is connected to a heating coil 44 located within a suitable heating chamber 45 mounted on extensions of the beams 10, and water is delivered to the coil from a pipe 46 connected to a reticulation system of approved pressure.

Alternatively, the pressure water may be obtained from an elevated tank.

Heat may be supplied to the chamber 45 by a gas burner 47 or other approved means, and, if necessary, a flue 48 may be fitted thereto.

The opposite or left hand ends of the flexible envelopes (Figure 1) are fitted with discharge pipes 49 connected by flexible tubes 50 to branches of a common discharge pipe 51 which is arranged at the end of the machine and which is provided with an extension 52 whereby the water is delivered to a discharge cock 53 arranged adjacent to the opposite end of the press.

A thermometer 54 and pressure gauge 55 are preferably arranged in the discharge pipe adjacent to the cock 53.

A by-pass pipe 56 connects the pipe 43 to the discharge pipe extension 52 and is under the control of a three-way cock 57 whereby water may be discharged without passing through the envelopes for a purpose hereinafter explained.

By means of this three-way cock, the water may be passed through the envelopes or the by-pass pipe or may be completely shut off as required.

In operation, veneered members as 58 (Figure 6) are placed in position in the compartments formed by the envelopes and the top and bottom plates of the machine, and the top plate is lowered by the means provided until the envelopes press initially against the center portions of the veneer sur-

faces of the work, owing to cambered formation of the said envelopes.

Water from the heater is simultaneously passed through the envelopes at a suitable temperature whereby the glue is maintained in a liquid condition, the cock 53 being open so that the pressure in the envelopes is relatively low, but sufficient to distend same.

The top plate is then further lowered, thus compressing the envelopes, which results in the glue between the veneer and the work being progressively displaced from the center to the sides and ends thereof.

It will thus be seen that the top plate is lowered until the envelopes are flattened sufficiently to bear against the whole surface of the work.

The cock 53 is then closed or partially closed so that the back pressure in the envelopes is increased to a desired degree, so that the flexible surfaces of the envelopes bear firmly against, and accommodate themselves to, any irregularities in the work.

It will be understood that the back pressure in the discharge pipe, which is under the control of the cock 53, is indicated by the pressure gauge 55 and the temperature which in indicated by the thermometer 54 may be controlled by means of the burner 47 or the like.

When the veneered members are firmly pressed together, the burner 47 may be turned out, so that the temperature of the water passing through the envelopes is reduced, thus accelerating the hardening of the glue or cement.

Alternatively, when it is desired to deliver cold water to the envelopes, same may be supplied through an additional pipe (not shown) connected to the supply pipe 43 in order to obviate the necessity of passing such water through the heating coils 44.

Finally, the supply of pressure water is cut off as by means of a cock 59 or the three-way cock 57 and the top plate is raised to permit of the removal of the veneered members.

In order to effectively control the temperature of the envelopes, it is desirable to indicate the rate of flow of the water, as well as the temperature thereof, and any suitable rate of flow indicator may be provided for this purpose.

A suitable device for this purpose is indicated in Figure 7 where the water discharges from the cock 53 into a vertical perforated barrel of approved length the rate of discharge being indicated by the level of water therein, during operation, as clearly illustrated.

A device of this character is preferably calibrated by experiment in conjunction with temperature readings, so that the desired thermal conditions of the envelopes may be readily controlled.

When the water is being raised to the desired temperature and its rate of flow and pressure for any particular purpose is being adjusted, the water may conveniently be by-passed to discharge through pipe 56 by the manipulation of the three-way cock 57.

It will be apparent that the press may be constructed in many different ways and that, for example, the top plate may be raised and lowered by any approved means, other than those described.

Although the machine has been described and illustrated with the top and bottom plates and envelopes arranged horizontally, it will be further understood that they may be arranged at any desired angle according to particular requirements.

Furthermore, in lieu of being flat, the envelopes may be of curved formation to suit special classes of work.

It will be understood that the flexibility of the envelopes permits of the veneer being pressed uniformly against the whole surface of the work placed therebetween, whilst the control of the temperature of the water enables the operator to heat or cool the glue as desired and obviates the use of heated zinc plates and the like.

If desired, the linings on the adjacent surfaces of the decks 14 and 30 may take the form of flexible envelopes whereby the temperature thereof may be placed under effective control.

In the appended claims, the word "veneer" is intended to comprehend any thin material to be secured to other members by means of glue or cement and "envelope" includes any flexible bag or container employed for the purposes above set forth.

I claim:—

1. A veneer press comprising a fixed horizontally disposed base plate, an adjustable top plate arranged in vertical alignment with the base plate, means for adjusting the top plate to and from the base plate, and for retaining it in an adjusted position, a plurality of flexible metal envelopes disposed parallel with and arranged between the fixed and adjustable plates, means for adjustably supporting the envelopes in position, means for delivering water under pressure to one of the ends of the said envelopes, means for discharging the water from the opposite ends of the envelopes, and valve mechanism in the discharge means for regulating the pressure within the envelopes.

2. A veneer press comprising a fixed base plate, vertical screw shafts at opposite ends of the base plate, nuts on the screw shafts supporting an adjustable top plate, means for rotating the screw shafts in unison to regulate the position of the adjustable top plate, a plurality of flat flexible metal envelopes disposed parallel with and arranged between the fixed and adjustable plates, said envelopes being substantially inextensible at

the edges, and means for supplying heated water under pressure to the said flexible envelopes.

3. In a veneer press according to claim 2, bevel gears on the lower ends of the screw shafts, a longitudinally disposed shaft, bevel gears on the longitudinally disposed shaft meshing with gears on the screw shafts, a gear on one end of the longitudinal shaft, a pinion meshing with the gear and a crank handle for imparting motion to the pinion.

4. In a veneer press according to claim 2, flexible tubes for delivering water to and discharging it from opposite ends of the envelopes, a common discharge pipe associated with the flexible discharge tubes, and a valve in the common discharge pipe for shutting off and regulating the flow of liquid.

5. In a veneer press according to claim 2, flexible tubes for delivering water to and discharging it from opposite ends of the envelopes, a common discharge pipe associated with the flexible discharge tubes, a valve in the common discharge pipe for shutting off and regulating the flow of liquid, and a valve controlled by-pass pipe for delivering the water direct to the common discharge pipe from the supply pipe.

6. A veneer press comprising, parallelly disposed rigid plates, a flexible metal envelope arranged between and having its opposed flexible faces directed towards the said rigid plates, means for passing heated fluid under pressure through the envelope, and means for throttling the discharge of said fluid from the envelope.

7. A veneer press comprising a pair of parallelly disposed rigid plates, a plurality of shallow flexible metal envelopes arranged parallelly between the rigid plates and having their opposite faces arranged to impart a yielding pressure against interposed pieces of work, and means for circulating heated water under pressure through the envelopes.

8. A veneer press comprising a pair of parallelly disposed rigid plates, means for adjusting said plates to and from each other, a plurality of shallow flexible envelopes arranged between the rigid plates and spaced apart to accommodate the work therebetween, said envelopes being substantially inextensible in a direction parallel to their operative faces, means for supplying fluid under pressure to the envelopes and means for discharging said fluid therefrom.

9. A veneer press comprising a fixed horizontal plate, an adjustable plate arranged above and parallel to the fixed plate, means for adjusting the last-mentioned plate towards and from the fixed plate, a substantially flat flexible envelope arranged between the fixed and adjustable plates, means for adjustably supporting the flexible envelope from the adjustable plate, said envelope being substantially inextensible at its edges and having its opposite faces arranged to impart a yielding pressure against adjacent articles of work, and means for supplying water under pressure to the said envelope.

10. A veneer press according to claim 8 wherein the flexible envelopes each comprise a pair of flexible metal sheets of cambered formation connected at their meeting edges.

11. In a press for applying veneers to articles, a substantially flat sided flexible envelope, the opposite sides of which are arranged to impart a yielding pressure to adjacent pieces of work, said envelope consisting of thin flexible sheets which are so connected at the edges of the envelope as to substantially prevent extension thereof in a direction parallel to its operative faces, means for delivering a pressure fluid to the envelope, and separate means for discharging the fluid therefrom.

In witness whereof I hereunto affix my signature.

ERNEST GEORGE LACEY.