

April 5, 1955

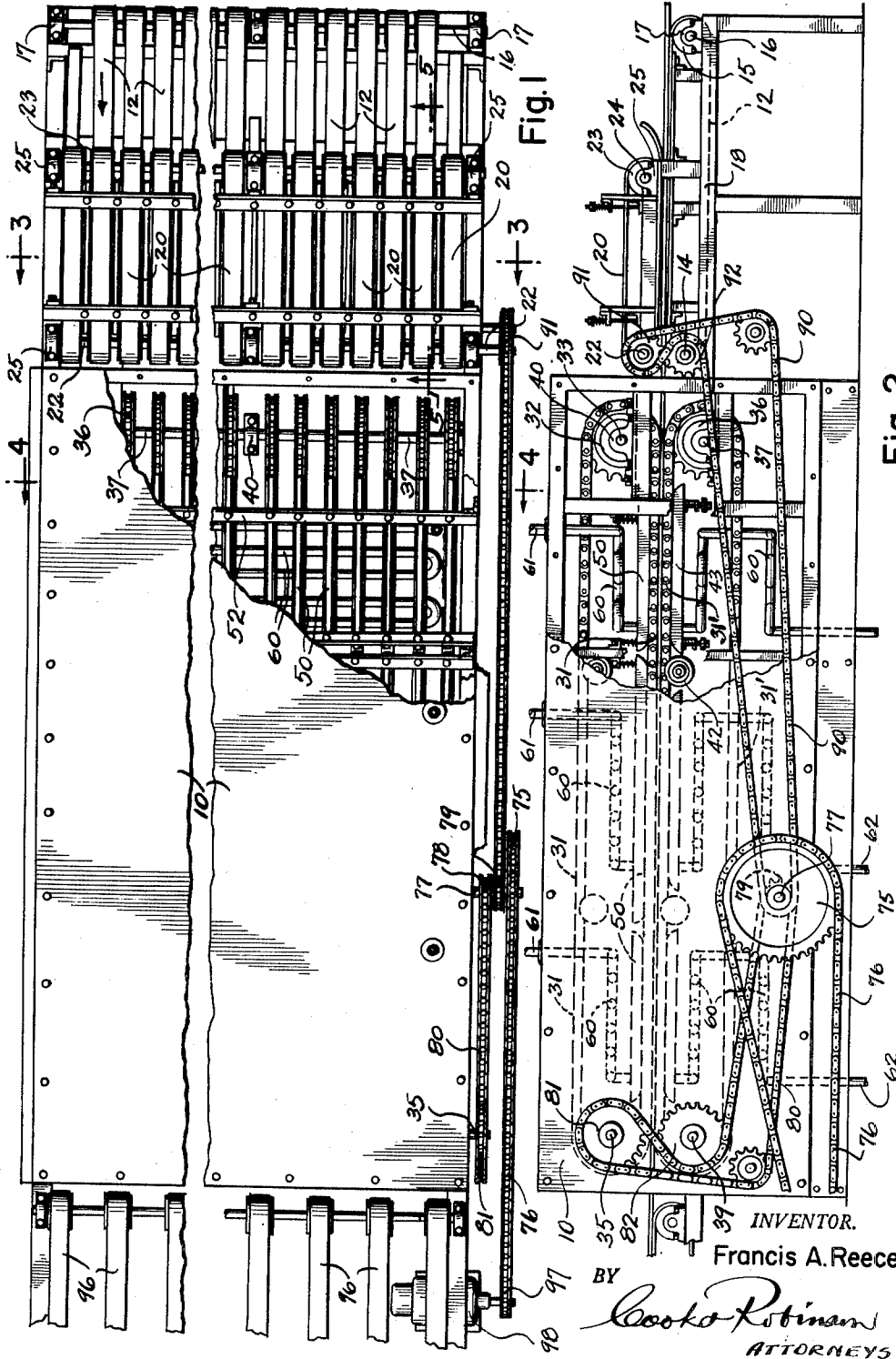
F. A. REECE

2,705,514

EDGE GLUER FOR VENEER STRIPS

Filed Feb. 19, 1953

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

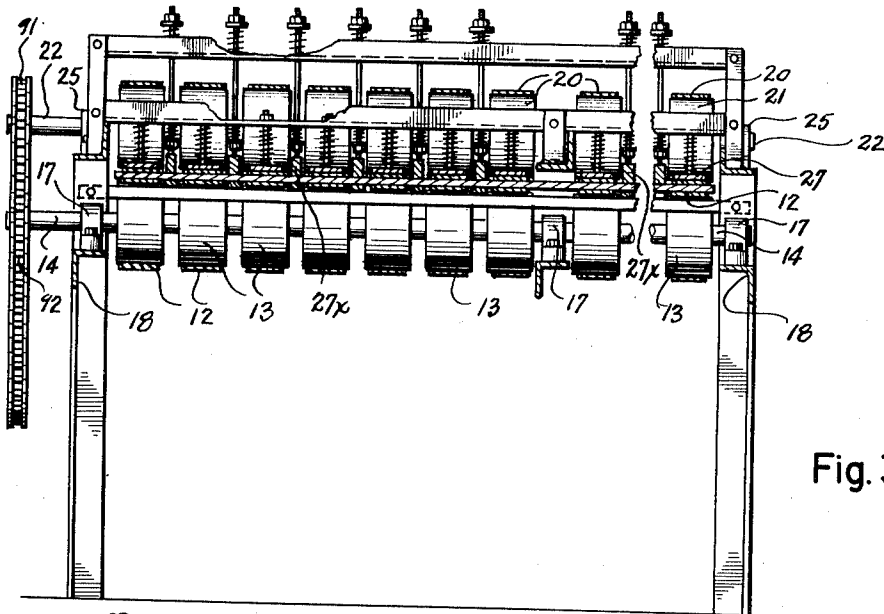


Fig. 3

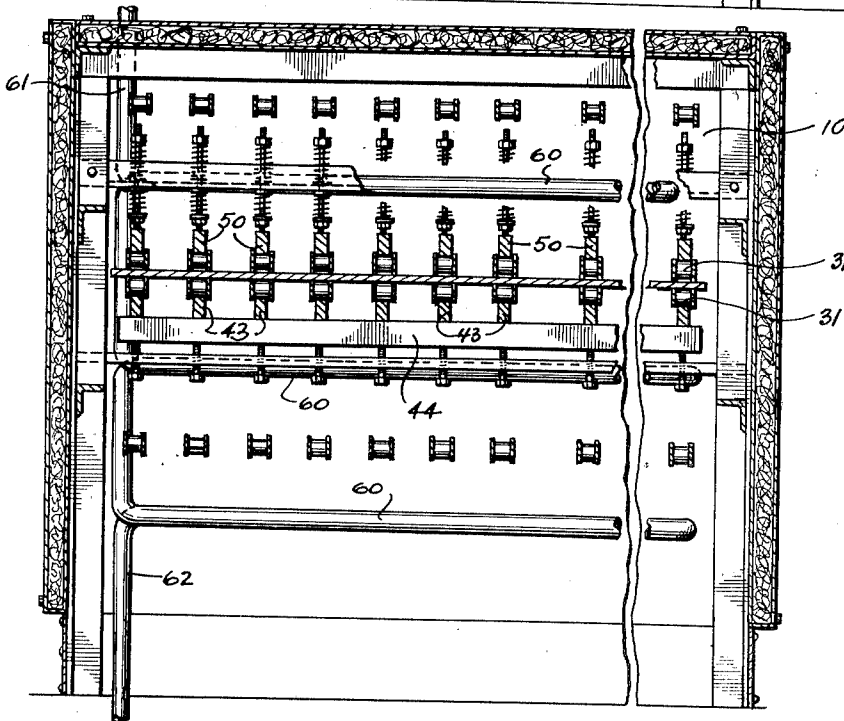


Fig. 4

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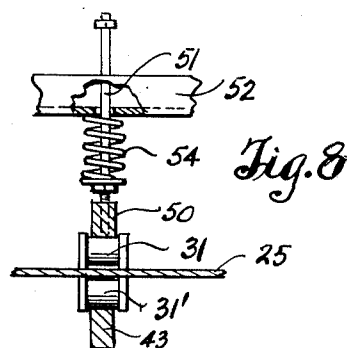
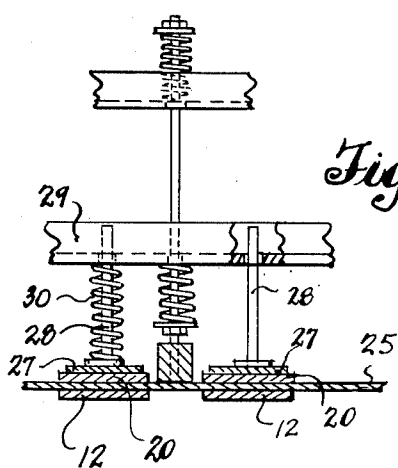
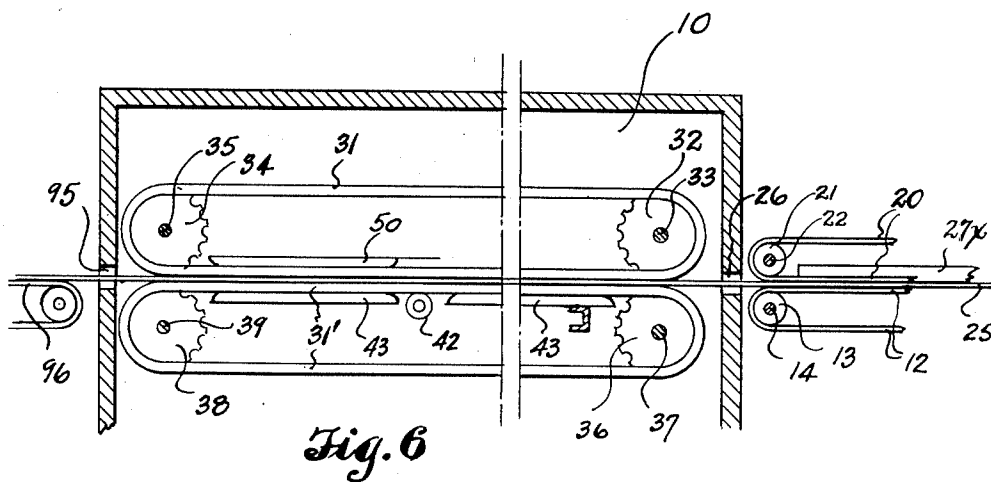
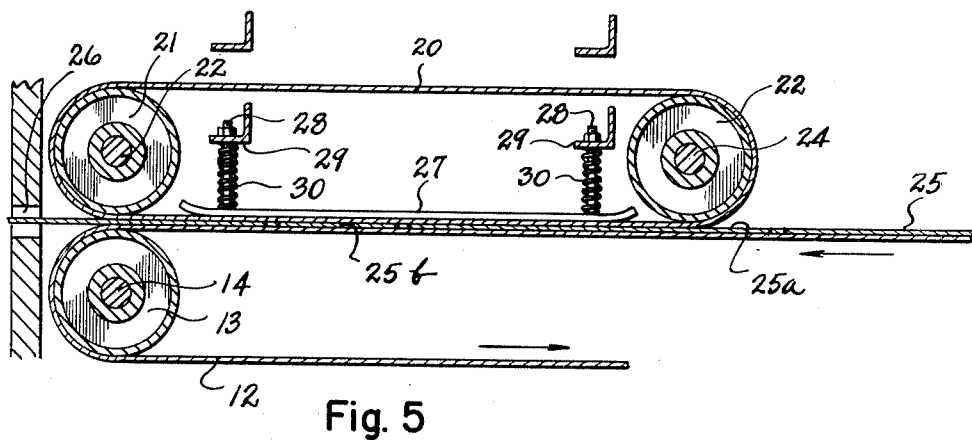
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1

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EDGE GLUER FOR VENEER STRIPS

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3 Claims. (Cl. 144—281)

This invention relates to improvements in machines which in the industry to which they pertain, are designated as "edge gluers." More particularly, the invention relates to machines which are designed to be used by manufacturers of veneer and plywood as a means for gluing together relatively short pieces of veneer of random length thus to form them into a continuous strip which, as it emerges from the gluing machine, may be cut, clipped or sized to form sheets of predetermined or standardized widths as for use in the making of plywood or for other purposes.

It is the principal object of this invention to provide a machine comprising novel means whereby pieces of veneer, usually relatively narrow veneers but not necessarily so, and which have been jointed or edged and also edge glued before being fed into the machine, are brought firmly and evenly together and held in edge to edge contact and against buckling or warping, while advanced through a drying chamber for curing or setting the glue joints so that the pieces emerge from the chamber as a continuous strip.

It is a further object of this invention to provide an edge gluer of the above stated character having a drying chamber that is steam heated through the use of pipe coils located therein at levels that are above and below the belts between which the veneer strip is held and advanced.

Another object of the invention is to provide an edge gluer comprising upper and lower sets or series of chain belts between which the pieces of jointed and edge glued veneer are received and are held in edge to edge contact while advanced in the drying chamber and to provide supporting and leveling bars or rails for the strip supporting runs of the conveyor chains, and hold down bars for the chains that overlie the strip for the purpose of preventing any warping or buckling of the veneer strip while being moved and while the glue joints are drying.

Still further objects and advantages of the invention reside in the details of construction of the various parts and in their combination and in the mode of use of the machine, as will hereinafter be fully described.

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

Fig. 1 is a top or plan view of an edge gluer embodying the improvements of the present invention therein, parts of the drying chamber being broken away to reduce the size of the view and for disclosure of covered or enclosed parts.

Fig. 2 is a side view of the machine, with part of the side wall of the drying chamber broken away to show certain interiorly contained parts.

Fig. 3 is a somewhat enlarged cross-section taken through the feed mechanism on the line 3—3 in Fig. 1.

Fig. 4 is a cross-section through the drying chamber on line 4—4 in Fig. 1.

Fig. 5 is an enlarged sectional detail, taken lengthwise of feed belts on the line 5—5 in Fig. 1, and showing a hold down plate as applied to one of the feed belts.

Fig. 6 is a vertical sectional view showing the entrance and discharge ends of the drying chamber, and the relationship of feed belts to conveyor chain belts within the drying chamber.

Fig. 7 is an enlarged sectional detail showing a feed belt hold-down plate and its mounting.

2

Fig. 8 is a sectional detail showing a supporting rail and pressure bar as applied to the conveyor chain belts.

Before describing the present mechanism, it will be explained that the previously referred to relatively short or narrow veneers that are to be joined together edge to edge, are delivered to the machine after being properly edged or jointed and with a suitable thermo-setting glue applied to those edges that are to be joined together. An operator, stationed at the receiving end of the machine, places the veneer pieces flatly and in succession, in an edge to edge relationship, upon a series of moving feed belts by which they are advanced into a drying chamber where they are received between the coacting, paired and coextensive runs of an upper and a lower series of conveyor chain belts. The rate of travel of the coacting feed belts is somewhat faster than that of the chain belts that are located within the drying chamber and as a result, the glued edges of the successively advanced pieces of veneer are caused to be pressed firmly together and held in that relationship upon entering between the coacting chain belts and thereafter held against any relative movement during the entire joint drying and glue setting operation. When the strip emerges from the discharge end of the drying chamber, the joints are completely set.

Referring more in detail to the drawings:

The present machine comprises a drying chamber which is herein designated in its entirety by reference numeral 10; this chamber being a rectangular, box-like structure of substantial dimensions, with its enclosing walls suitably insulated against the dissipation of heat therethrough. Within the chamber are the chain conveyor belts for holding and conveying the veneer, and the banks of steam heated pipe coils, for drying the glue joints; these parts presently being fully described.

In the present views of the drawing, it has been indicated that the material enters the drying chamber from the right hand end and emerges from the left hand end. The width of the chamber will be as required to accommodate the width of pieces to be joined and also it can be of any required length.

As shown best in Figs. 1 and 2, a feeding mechanism for the veneer pieces is arranged at the receiving end of the chamber. This feeding mechanism comprises a lower set of flat belts 12, of fabric, leather or the like which, at their opposite ends, operate, as seen in Fig. 5, about pulley wheels 13 on a horizontal cross-shaft 14, and pulley wheels 15 on a horizontal cross shaft 16. These belts, 12, are parallel and are disposed relatively close together, as noted in Fig. 1, and their top runs are all supported in the same horizontal plane. The cross-shafts 14 and 16, are revolvably supported at the same level in suitable bearings, 17, fixed on a supporting frame structure 18 at the receiving end of the chamber, and the belts are all driven in the same direction as indicated by the arrows placed therein in Fig. 1.

An upper series of feed belts is located immediately above the series just described. This series comprises a succession of parallel belts 20, of fabric, leather, or the like, which at their opposite ends, operate about pulley wheels 21 on a horizontal cross-shaft 22, and pulley wheels 23 on a cross-shaft 24; these shafts being parallel and revolvably mounted in supporting bearings 25 which also, are fixed upon the frame structure 18. The cross-shaft 22 is located directly above the cross-shaft 14 and the pulleys 21 are so spaced thereon that lower runs of the belts 20 are paired with and located immediately above and close to the top runs of the belts 12.

It is well shown in Figs. 1 and 5, that the belts 12 of the lower series extend at their receiving ends, well beyond the adjacent or receiving ends of the belts 20 of the series. Thus, the receiving end portions of the top runs of the belts 12, being in the same horizontal plane, coact to provide a sort of receiving table upon which the veneer pieces to be joined are manually placed in succession and one at a time for advancement into the drying chamber. The relationship of the feed belts 12 and 20 is well shown in Fig. 5, and it will therein be observed that the veneer pieces are adapted to be received between the supporting top runs of belts 12 on which they are placed and the lower runs of the belts 20 as paired therewith. The belts are all driven at the same

3

speed and in such direction as to carry the veneer pieces between them to and then advance them into the drying chamber 10 where they are immediately received by and held between the paired and coacting chain conveyor belts as presently fully described.

For the purpose of proper understanding, I have indicated separate veneer pieces in Fig. 5 by reference numerals 25, 25a and 25b, and it is therein indicated that they have been successively placed on the feed belt table, close together for advancement into the drying chamber 10, being advanced therinto through a narrow receiving opening 26 which is indicated in Figs. 5 and 6.

To hold the feed belts 20 in close contact with the veneer pieces being advanced, I provide each of the lower runs of these belts with hold down plate 27 as seen in Figs. 5 and 7. These plates are held in place by bolts 28 fixed vertically in their opposite end portions. The bolts extend upwardly and slidably through holes provided therefor in rigidly secured cross-beams 29. Coiled spring 30, applied about the bolts, press the plates downwardly and firmly against the belts, and thus press the belts against the plywood pieces.

It is further shown in Figs. 3 and 6 that there are hold down bars 27 between the belts 20 arranged to ride upon the veneer. These bars also are urged downwardly by spring means like that which is associated with the plates 27; this being shown in Fig. 3.

Within the drying chamber 10 is an upper and a lower series of chain conveyor belts. The belts of the upper series are individually designated by numeral 31, and those of the lower series are designated by numeral 31'. The belts of each series are of the same kind, being made up of roller equipped sprocket chains and all are of the same length. Belts of the upper series operate at the receiving end of the chamber about sprocket wheels 32 fixed on a horizontal cross-shaft 33. At the discharge end of the machine they operate about sprocket wheels 34 on a cross shaft 35. Likewise, the chain belts of the lower series operate, at the receiving end of the machine, about sprocket wheels 36 fixed on a cross shaft 37, and at the discharge end operate about sprocket wheels 38 on a cross-shaft 39.

The top runs of the chain belts of the lower series are all disposed to travel in the same horizontal plane and receive the veneer pieces directly thereonto from between the feed belts 12 and 20. The chain belts are aligned with the feed belts as seen in Fig. 1. The top runs of the lower chain belts are supported at spaced intervals by rollers 42 and between the rollers they ride upon supporting bars or rails 43 that are adjustably supported on cross-beams 44, disposed in the chamber, transversely thereof and fixed to the chamber frame structure. The rails 43 and rollers prevent any possible sagging of the chains and the chains thus provide a perfectly flat supporting surface for the veneer sheet as advanced through the drying chamber.

The lower runs of the chain belts of the upper series are arranged to lie flatly upon the veneer strip as it is advanced. These chains are paired with the chains of the lower series and are yieldingly pressed downwardly against the veneer strip to prevent any possible warping or buckling thereof during the drying operation, and thus to prevent any pulling apart of the glued edges and insure the integrity of the finished joints. This holding of the chains is accomplished by a succession of hold down bars 50 located end to end upon each of the lower runs of the chains along their full lengths. These bars are held in position by bolts 51 fixed vertically in their ends and extending upwardly and slidably through holes in a cross-beam 52 fixed in the frame structure. Coiled spring 54, applied about the bolts urge the bars downwardly and thus cause the chains to be pressed down against the veneer sheet as conveyed through the chamber.

The various cross-shafts 33, 35, 37 and 39 are parallel and are revolvably supported in bearings 40 that are fixed to the frame structure of the chambers.

For the heating of the chamber 10 to effect the drying of the glued joints, I provide a plurality of banks of pipe coils 60. Some of these coils are located closely above and below the plane along which the veneer strip is conveyed. Others are in the bottom portion of the oven. As indicated in Figs. 2 and 4, the pipe coils are connected by supply pipes 61 with a source of supply of steam under pressure, not shown, and have drain pipe connections 62.

For the driving of the feed belts 12 and 20 and con-

4

veyor chain belts, 31-31', I provide the driving means shown in Fig. 1 and Fig. 2 wherein 75 designates a relatively large sprocket wheel that is driven by a sprocket chain belt 76. Wheel 75 is supported on and fixed to a shaft 77, on which shaft two sprocket wheels 78 and 79, of relatively small diameter are fixed as noted in Fig. 1. A sprocket chain belt 80 operates about sprocket wheel 78 and is extended over sprocket wheels 81 and 82 of the same diameter that are fixed on the outer ends of the shafts 35 and 39, in such manner as to drive these shafts in opposite directions and to cause the chain belts 31 and 31' to travel in such direction as to convey the veneer strip between them from the receiving end of the chamber to the discharge end.

Likewise, a chain belt 90 operates over sprocket wheel 79 and this is passed about sprocket wheels 91 and 92 fixed on the ends of the belt driving shafts 22 and 14 to cause these belts to convey the pieces of veneer between them into the chamber. The driving of the feed belts 12 and 20 contemplates that they shall advance the veneer pieces at a slightly faster speed than the strip is advanced by the conveyor chains, 31-31', thus to provide for the edge to edge abutment and tight holding of the joined edges together while the pieces are successively being advanced into the chamber and between the receiving conveyor chains.

At the discharge end of the chamber 10 is a horizontal slot or opening 95 through which the formed veneer strip is advanced onto offbearing conveyor belts 96 whereby it may be conveyed to a trimmer.

It is shown in Fig. 1 that the driving belt 76 operates over a sprocket wheel 97 on the drive shaft of an electric motor 98. However, any other suitable driving means might be employed for this purpose.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is:

1. A gluer of the character described comprising an oven having a front end provided with an inlet and a rear end provided with an outlet opposite the inlet, strips in said oven spaced transversely from each other and constituting rails extending longitudinally between the inlet and the outlet, cross bars in said oven supporting said rails, upper and lower sprocket wheels rotatably mounted in front and rear portions of said oven above and below said rails, upper and lower chain belts extending between and trained about the front and rear sprocket wheels, the lower chains having upper flights resting upon said rails and the upper chains having lower flights disposed over the upper flights of the lower chains and cooperating therewith for moving through the oven strips of material having an adhesive applied to confronting surfaces, resilient means urging said cross bars upwardly and thereby applying upward pressure to said rails, pressure bars above lower flights of the upper chains extending longitudinally thereof, upper cross bars disposed above said pressure bars and extending transversely thereof between the flights of the upper chains, pins extending upwardly from said pressure bars and slidably passing through the upper cross bars, springs about said pins urging the pressure bars downwardly and applying downward pressure upon the lower flights of the upper chains, and heating members in said oven spaced from each other longitudinally thereof and each consisting of a pipe having end portions extending through spaces between the upper and lower chains and adjacent sides of the oven and other portions extending transversely of the oven between flights of the upper and lower chains and subjecting both upper and lower surfaces of strips moved through the oven by the chains to equal applications of heat.

2. A gluer of the character described comprising an oven having a front end wall provided with an inlet and a rear end wall provided with an outlet opposite the inlet, upper and lower front and rear sprocket wheels rotatably mounted in said oven adjacent the said front and rear end walls and disposed in planes above and below the inlet and the outlet, upper and lower conveyor chains extending between and trained about the front and rear sprocket wheels, the upper chains having lower flights disposed over and adjacent upper flights of companion lower chains, pressure bars extending longitudinally of the said flights of said chains, spring means urging said pressure bars towards companion flights of said chains for applying pressure to strips moved through the oven between the said flights of said chains and having confronting surfaces

5

covered with an adhesive, heating members spaced from each other longitudinally of the oven and each consisting of a pipe having portions extending in said oven partially above and partially below flights of the chains and other portions in the form of transversely disposed coils extending back and forth between upper and lower flights of the chains and subjecting upper and lower surfaces of the strip to heat, and means for feeding strips to be glued together inwardly through the inlet and between the said adjacent flights of the chains and out through the outlet.

3. A machine for edge gluing flat workpieces, said machine comprising an oven structure including front and rear walls, one of said walls having an entrance opening and the other of said walls having an exit opening, said openings being aligned for the admission and exit of workpieces, upper and lower sprocket wheels rotatably mounted in the oven between said front and rear walls and above and below said openings, upper and lower endless chain belts extending between and trained about the front and rear sprocket wheels, said upper and lower chain belts having respectively lower and upper closely spaced cooperative flights between which the workpieces are held for movement through the oven in the plane of the aligned openings, rail members in longitudinal and transverse alignment with each other below and extending longitudinally of the upper flights of the lower chains, means

6

supporting said rail members and maintaining the same against and in supporting relation with the undersides of said upper flights, said rail members having adjacent ends spaced apart, supporting rollers between said spaced ends of the rail members and having the overlying flight bearing thereon, elongate aligned pressure bars disposed to extend longitudinally of and bearing down upon the lower flights of the upper chains, means supporting said pressure bars for movement toward and relative to the said lower flights, means yieldingly urging the pressure bars against said lower flights, and heating units contiguous to the said upper and lower cooperative flights of the chains.

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