

April 27, 1943.

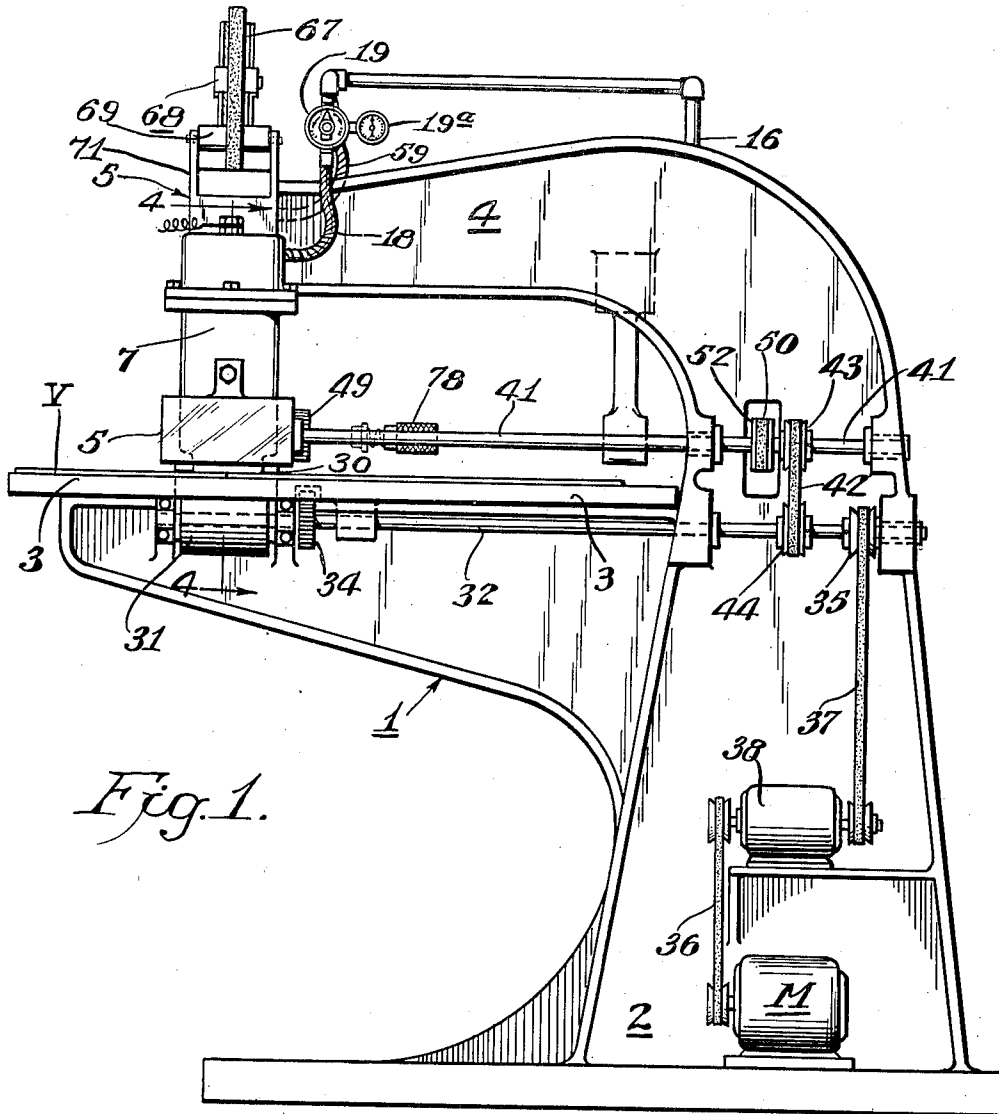
R. L. DENNIS

2,317,446

VENEER GLUING MACHINE

Filed Feb. 1, 1941

4 Sheets-Sheet 1



Inventor:—
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Henson & Henson

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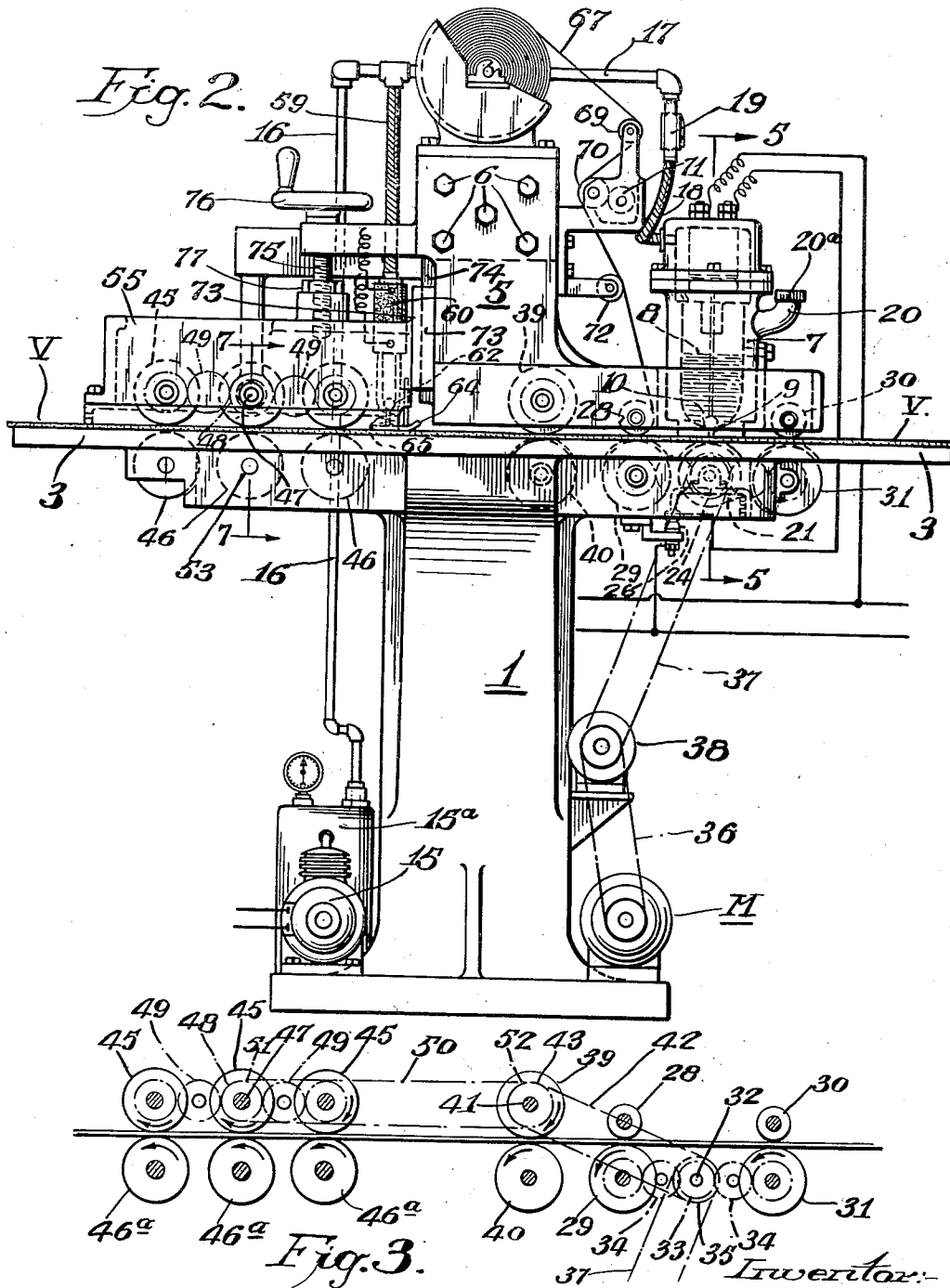
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4 Sheets-Sheet 2



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Fig. 5.

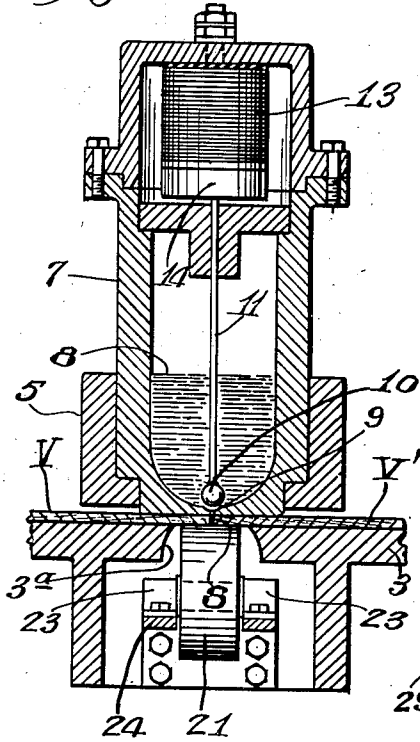


Fig. 4.

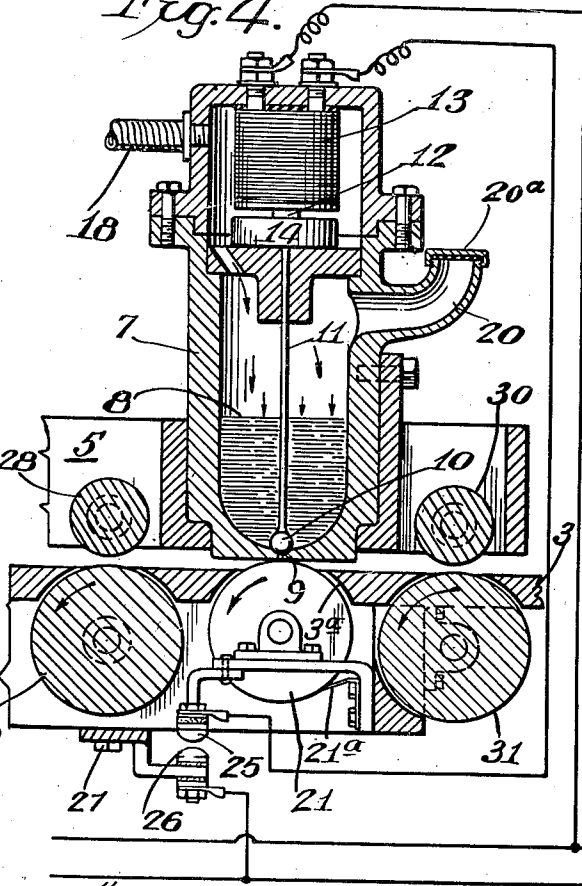
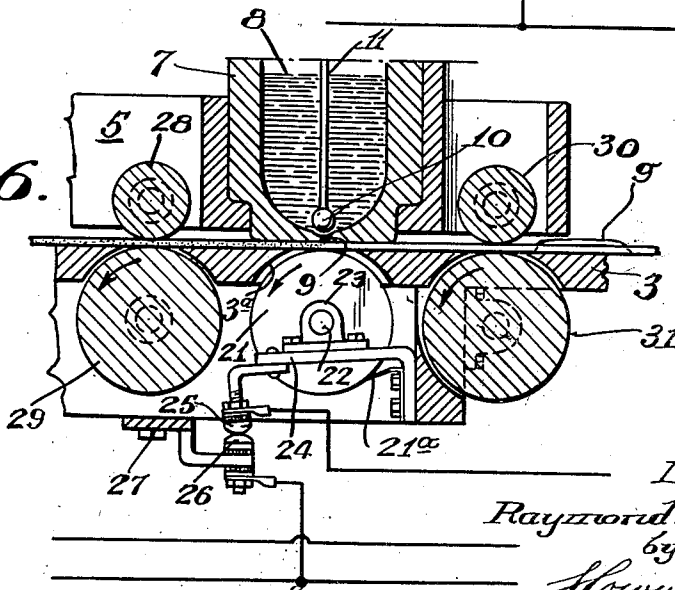


Fig. 6.



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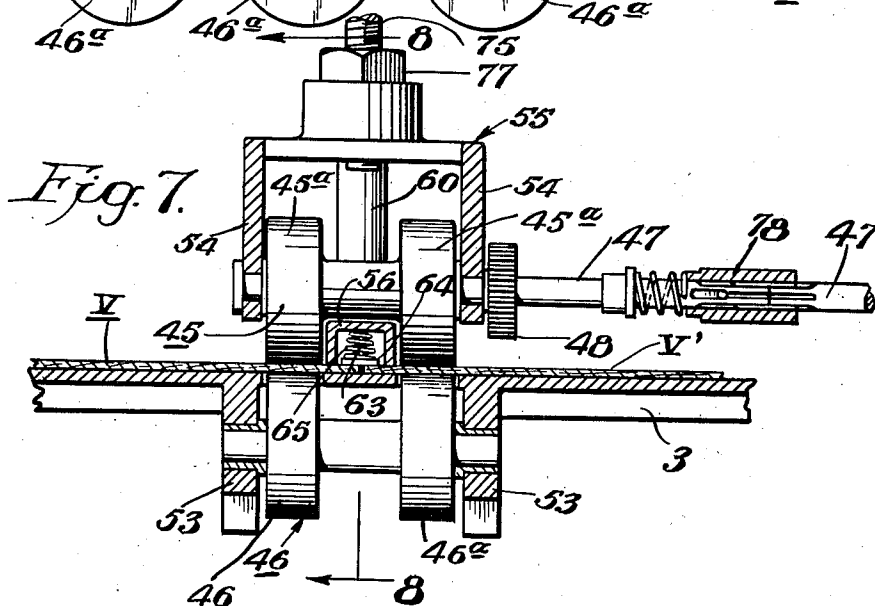
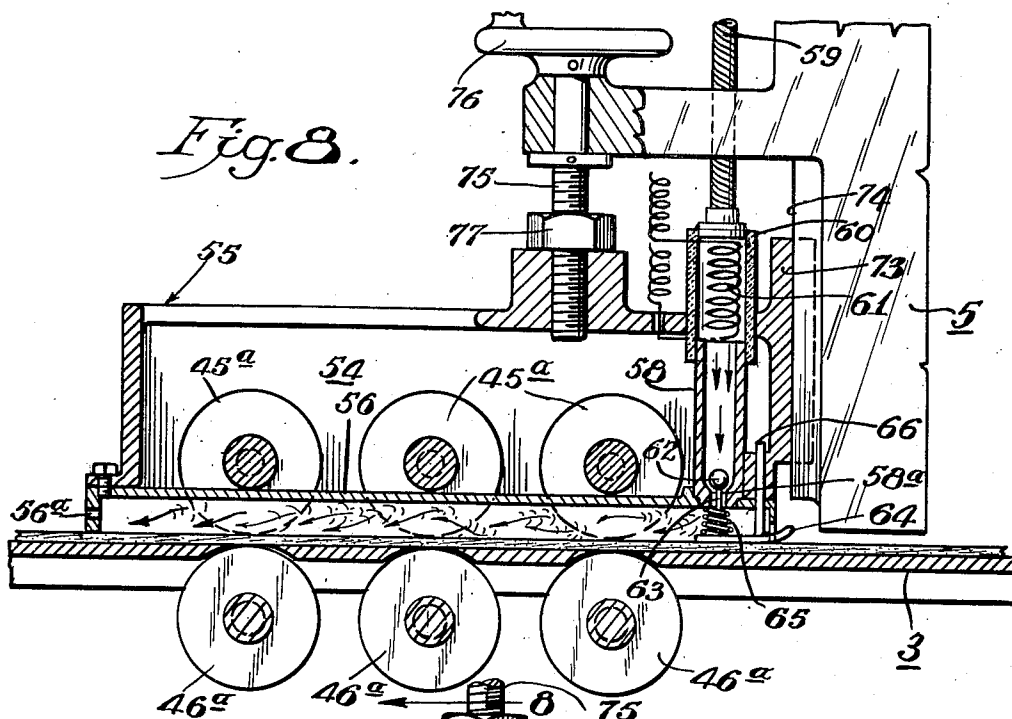
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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,317,446

VENEER GLUING MACHINE

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7 Claims. (Cl. 144—279)

This invention relates to a veneer joining machine. It is common practice in preparing veneers in order that a sufficient length and width thereof may be made to cover a surface, such as a table, desk or the like, to join two or more veneers, which may be of a relatively narrow width, together bringing the side edges of the veneers which are to be joined together into close and intimate contact and gluing the same securely.

Veneers may be of less than $\frac{1}{8}$ of an inch in thickness in many cases, and previously it has been the universal practice to bring the joints together and overlap the same with a tape, so-called, which may be a thin continuous strip of paper, $\frac{3}{8}$ to one inch in width, and glue this tape to both veneers at each side of and lengthwise of the joint. The tape, after a veneer has been laid on a bed for a table, desk top or equivalent structure has to be removed by a finishing process, involving the complete removal of the tape by sanding or other equivalent operation, all of which is expensive, while if the veneer is laid with the tape inside, even though the thickness of the tape is but a few thousandths of an inch, it provides a ridge noticeable after the table is finished.

Thus the present invention involves a machine for glue connecting the longitudinal edges of veneers without the necessity of using any covering tape over the joint, although provision is made in said machine for joining veneers together with tape connecting means should the use thereof be desired.

Particularly the present invention has for its primary object the provision of a machine of the present type having novel mechanism for feeding or depositing glue between adjacent veneer strips together with a novel arrangement for regulating and controlling the quantity and uniformity of rate of feed of each glue.

The invention also consists in certain novel organizations and constructions and arrangements of parts and elements for effectively gluing together veneer strips, and these as well as the various features and details of the construction and operation thereof are hereinafter fully set forth and described and shown in the accompanying drawings, in which:

Figure 1 is a view in side elevation of a veneer gluing machine embodying the present invention.

Figure 2 is a front elevation view of the machine shown in Figure 1.

Figure 3 is a diagrammatic view in elevation

showing the arrangement and driving connections of the several sets of rolls or rollers present in the machine of Figures 1 and 2.

Figure 4 is an enlarged fragmentary view in section taken on line 4—4, Figure 1, the control mechanism being shown in inoperative position.

Figure 5 is an enlarged fragmentary view in section taken on line 5—5, Figure 2.

Figure 6 is an enlarged fragmentary view of the lower portion of Figure 4 showing the control mechanism in operative position.

Figure 7 is an enlarged fragmentary view in section taken on line 7—7, Figure 2; and

Figure 8 is a sectional view taken on line 8—8, Figure 7.

Referring now more particularly to the drawings, reference numeral 1 designates the machine main frame structure comprising, as shown, a base portion 2, table or work supporting surface portion 3 and an elevated arm portion 4 which forwardly overhangs the said table surface 3.

A frame structure 5 is secured to the forward free end of the overhanging arm 4 by means of bolts 6, and secured to and carried by this frame 5 above the table 3, from right to left with respect to Figure 2, are the glue depositing or feeding mechanism and its associated rolls, converging rolls and a set of holding or pressure rolls.

In operation and use of the machine the veneer strips V—V' to be glued together are fed from right to left through the machine (reference being had to Figure 2) in slightly spaced apart relation as indicated at s in Figure 5. This is determined in the usual way by means of a gauge g interposed therebetween. Considering now the several parts of the machine in the order set forth above, the glue feeding mechanism comprises a receptacle or tank 7 arranged to contain glue 8. Located in the bottom of this receptacle or tank 7 and directly over the space s intermediate the veneer strips V—V' to be glued is a discharge or feed orifice 9 through which the flow of the glue is controlled by means of a ball or other suitable valve element 10.

The valve 10 has an elongated stem 11 and its upper end forms the plunger or core 12 of a solenoid whose coil 13 is electrically energized to raise the valve 10 and open the orifice 9 in a manner to be hereinafter described. Associated with the valve stem is a weight 14 which causes the valve 10 normally to close the orifice 9 when the solenoid coil 13 is deenergized.

The glue 8 is discharged from the tank 7 through its orifice 9 under the influence of air

or like pressure and the rate of glue discharge is regulated and controlled by the pressure head maintained within the said tank 7. Pressure within the tank 7 is provided by means of a suitable motor compressor unit 15 which has its discharge connected with said tank 7 through a storage tank 15a and suitable piping or tubing 16, 17 and 18.

Since the rate of feed of the glue from the tank 7 through its orifice 9 is controlled by the pressure within said tank as aforesaid, suitable means is provided for maintaining a uniform predetermined pressure head in the tank 7 and in order to accomplish this there is connected in the pipe 17 a suitable manually operable control or regulating valve 19 of conventional design having associated therewith a gauge 19a for visibly indicating the pressure. This device 19 may be adjusted at will by the operator to maintain a predetermined uniform pressure within the tank 7. The glue may be supplied to the tank 7 from time to time through a filling spout 20 provided with a seal closure 20a so that the said tank 7 may be proof against pressure leaks.

Located directly beneath the orifice 9 of tank 7 is an idler roll 21 having a shaft 22 the ends of which are journaled in suitable bearings 23. These bearings 23 are secured upon resilient supports 24 which function to urge the roll 21 upwardly with the result that, when no veneer strips are being fed through the machine and beneath the glue tank 7, the said roll 21 is projected upwardly through a slot 3a in the table portion 3 and against the outlet of the orifice 9 thereby closing the latter to prevent possible leakage of glue therefrom (see Figure 4). Preferably, the roll 21 is provided with a scraper 21a to remove from the roll periphery any glue adhering thereto.

This arrangement may be employed to control automatically the energization of the solenoid coil 13 by the feed of the veneer strips V—V' into the machine, and for this purpose there is associated and movable with the resilient mounting 24 a suitable switch contact 25 arranged in cooperative relation with a second contact 26 fixedly mounted upon the machine frame as indicated at 27. These switch contacts 25 and 26 are connected in one side of the electrical power supply circuit of the solenoid coil 13 and hence it will be seen that when the absence of veneer strips V—V' permits the supports 24 to raise the roll 21 against the outlet of orifice 9, as shown in Figure 4, the switch contacts 25 and 26 are disengaged thereby opening the circuit to the solenoid coil 13 whereas the insertion of veneer strips in the machine causes the roll 21 to be depressed thereby engaging said contacts 25 and 26 to close the circuit and energize the solenoid coil 13 to lift valve 10 and open said orifice 9 whereupon glue is discharged through into the space s between said veneer strips (see Figure 6).

Arranged at opposite sides of the glue depositing mechanism are opposed pairs of pressure-feed rolls 28, 29 and 30, 31 respectively. The upper rolls 28 and 30 of each of these pairs are idlers while the lower rolls 29 and 31 of each pair are positively driven by a shaft 32 through suitable gears 33 and 34 (see Figures 1 and 3). This shaft 32 is driven by a pulley 35 from a motor M through suitable belts 36 and 37 and a gear reduction unit 38 as best illustrated in Figure 1.

Referring now to Figures 2 and 3 of the drawings, located to the left of the pressure feed rolls 28 and 29 is a pair of opposed converging rolls 39 and 40 which function in the usual manner

to move the veneer strips laterally toward each other and into contact. These rollers 39, 40 may be any one of several conventional forms of converging rolls employed in machines of the present type and if desired more than one pair thereof may be embodied in the machine. In the illustrated embodiment of the invention the lower roll 40 of this pair is an idler whereas the upper roll 39 thereof is positively driven by a shaft 41 which in turn is driven by a belt 42 and pulleys 43, 44 from the aforesaid shaft 32.

Still referring to Figures 2 and 3 of the drawings, a series of pairs of holding rolls 45 and 46 are located to the left of the converging rolls 39 and 40 and the lower rolls 46 of the series of pairs of rolls are idlers while the upper rolls 45 thereof are positively driven by a shaft 47 through suitable gears 48, 49, the shaft 47 being driven through a belt 50 and pulleys 51, 52 from the aforesaid shaft 41.

Referring now particularly to Figures 7 and 8 of the drawings, the lower idler rolls 46 are rotatably journaled in flange portions 53, 53 depending from the machine table portion 3, and the upper rolls 45 are journaled in the opposite side walls 54 of a housing structure 55. As shown, these rolls 45 and 46 are circumferentially recessed at their central portions thus providing relatively spaced roll portions 45a and 46a respectively of larger diameter for cooperative engagement with the opposite surfaces of the veneer strips V—V' passing therebetween.

Forming a part of the housing structure 55 and extending longitudinally thereof in the recesses between the large portions 45a of the series of upper rolls 45 is a hood or channel member 56 of inverted U-shape cross-section forming a duct for the passage of a suitable gas, such as air, which functions to effect or assist drying of the glued joint between the adjacent veneer strips.

The drying gas may be supplied to hood 56 through a duct 58 and a suitable hose 59 connected to the pipe 17 in the pressure line leading from the compressor 15 to the glue tank 7. Intermediate the aforesaid hose 59 and duct 58 is placed a suitable heater 60 containing an electrical resistance 61 over which the air flows and is heated before entering the hood 56. Since certain types of glue are dried by the action of cooled or chilled air rather than air at elevated temperatures, the invention contemplates, of course, that the heater 60 may be rendered inoperative and cooled air from a suitably refrigerated or cool source supplied to the hood 56 through said duct 58. Upon entering the hood 56 the air or other gaseous medium flows longitudinally in the direction of travel of the veneer strips and is finally discharged from said hood through a vent 56a in the left hand end thereof (see Figure 8).

The admission of gas from duct 58 to the hood 56 is automatically effected and controlled by the passage of the veneer strips V—V' through the machine and, as illustrated, this may be accomplished by providing a ball or like valve element 62 arranged to close the duct outlet orifice 58a. This valve is provided with a depending stem 63 the lower end of which is connected to a shoe element 64, and encircling the stem 63 between said shoe 64 and the roof or top of the hood 56 is an expansion spring 65 which tends to thrust the said shoe 64 downwardly and thereby seat the valve 62 to close the orifice 58a. Thus veneer strips passing through the machine engage and elevate the shoe 64 and valve 62 to open the

orifice 58a whereas when no strips are in engagement with said shoe 64 the spring 65 maintains the valve 62 in closing relation with the orifice 58a. To insure correct operation of the shoe and valve, a rod 66 extends upwardly from the shoe 64 and slides within a suitable guideway formed in the machine frame structure 5.

As previously stated, provision also is made in the present machine for the use of tape to secure together the adjacent veneer strips fed through the machines. For this purpose a roll of tape 67 is rotatably mounted in a suitable support 68 atop the arm portion 4 of the machine frame structure 1, and when it is desired to employ the tape 67 it need only be fed about a roll 69, a paste roll 70 (which applies paste thereto from a box 71), another roll 72 and then forwardly beneath the roll 28 into contact with the veneer strips passing therebeneath. Of course, it is understood that the tape 67 and the pressure gluing mechanism generally are used independently of each other and not both at the same time.

In some instances use of the holding rolls 45, 46 is neither necessary nor desired and in order that they may be rendered inoperative the rolls 45 and their supporting housing structure 55 are mounted for vertical sliding movement. For this purpose the housing 55 has a portion 73 which dovetails slidably within a vertical guideway or groove 74 formed in the frame member 5. Vertical adjustment of the housing 55 and its rolls 45 is effected by means of a jack screw 75 operated by a hand wheel 76 and a nut 77 is provided on said screw 75 for locking the housing 55 and rolls 45 in the position to which it may be vertically adjusted.

In order to permit vertical adjustment of the housing 55 and its rolls 45 as aforesaid, means is provided for breaking the driving connection from shaft 47 to said rolls 45. A quite simple manner of accomplishing this latter feature is to make the shaft 47 in two sections and provide between them a readily disconnectible coupling element 78 (see Figure 7) so that when it is desired to elevate the housing 55 and rolls 45 the said coupling 78 may be quickly uncoupled to disengage the driven section of the shaft 47 from the driving section thereof.

In operation, the adjacent veneer strips V—V' are advanced by the feed rolls 30, 31 and, while held in predetermined spaced apart relation by the gauge g, are fed by said feed rolls beneath the orifice 9 of the glue tank 7 whereupon said strips V—V' depress the roll 21 causing energization of solenoid coil 13 and opening of valve 10 so that glue is discharged from said orifice 9, at a predetermined rate of flow with respect to the rate of advancement of said veneer strips, directly into the joint or space s between the veneer strips. As the veneers pass through the machine the space s is filled by a continuous flow of the glue and said veneers continue their passage by means of the feed rolls 28, 29 through the converging rolls 39, 40 and thence through the holding rolls 45, 46. It will be obvious that the glue must be discharged only into the space s between the veneers and not overflow onto the upper surfaces thereof where it will show through the subsequently applied finish and mar the appearance of the veneer panel. As the veneers enter the housing 55 of the holding rolls 45 the shoe 64 is elevated to open the valve 62 and admit the drying medium to the hood 56 overlying the glued joint.

When the veneers pass from the roll 21 it rises

thus opening the solenoid circuit to close the glue orifice 9 and as they subsequently pass from beneath shoe 64 it lowers to close the drying medium valve 62, the glue valve 10 and said valve 62 then remaining closed until another pair of veneer strips is fed into the machine as aforesaid.

On the other hand, the pressure glue discharge mechanism may be rendered inoperative by opening a manual switch (not shown) in the circuit of the solenoid 13 and the veneers secured together by means of the tape 67 alone, or, if desired, both the glue mechanism and tape 67 may be employed together. In each of these modes of operation of the machine that is, when the tape 67 is used either alone or in conjunction with the gluing mechanism, it is desirable, if not essential, that the holding rolls 45 be raised from possible contact with the veneers and tape since, if they are not raised, as the veneers and tape continue to travel through the machine the glue coated tape has been observed to foul the rolls and parts of the machine.

While a particular embodiment of the invention has herein been illustrated and described, it is not intended to limit said invention to this disclosure but that changes and modifications may be made and incorporated therein within the scope of the annexed claims.

I claim:

1. A machine for edgewise gluing veneers together comprising in combination, means for feeding veneers to said machine in predetermined spaced apart relation and means for discharging a continuous flow of glue into the space between said veneers comprising a tank for said glue having a discharge orifice directly above said space between the veneers, a valve normally closing said orifice against the discharge of glue therethrough, a solenoid for opening said valve, a member located beneath the orifice and actuable downwardly by the passage of veneers between said member and the orifice, a pair of contacts closeable upon downward movement of the member operable to energize said solenoid and open said valve and permit the discharge of glue there-through into the space between the veneers.

2. A machine for the edge-wise gluing of veneer, comprising a worktable providing a surface along which pairs of veneers may be moved abreast in coplanar, closely spaced apart relation, means for so moving the veneers, a reservoir positioned above said worktable and having a substantially flat bottom portion disposed in spaced parallel relation with and above the surface over which the veneers are moved, said reservoir having a glue discharge orifice in said flat bottom portion disposed above and in alignment with the space between said veneers, and means for maintaining the veneers in firm engagement with the flat bottom portion of the reservoir on opposite sides of the discharge orifice as said veneers are moved with respect thereto including a presser roller mounted beneath the worktable for rotation about an axis transverse to the direction of travel of the veneer, means mounting said roller for bodily movement transversely of the plane of said worktable surface and across the path of movement of said veneer, spring means resiliently urging the periphery of the roller into engagement with successive pairs of veneers to maintain firm engagement between the upper-surfaces thereof and the under-surface of the reservoir, and means for controlling the discharge of the glue from said orifice.

3. A machine for the edge-wise gluing of

veneer, comprising a worktable providing a surface along which pairs of veneers may be moved abreast in coplanar, closely spaced apart relation, means for so moving the veneers, a reservoir positioned above said worktable and having a substantially flat bottom portion disposed in spaced parallel relation with and above the surface over which the veneers are moved, said reservoir having a glue discharge orifice in said flat bottom portion disposed above and in alignment with the space between said veneers, and means for maintaining the veneers in firm engagement with the flat bottom portion of the reservoir on opposite sides of the discharge orifice as said veneers are moved with respect thereto including a presser roller mounted beneath the worktable for rotation about an axis transverse to the direction of travel of the veneer, means mounting said roller for bodily movement transversely of the plane of said worktable surface and across the path of movement of said veneer, spring means resiliently urging the periphery of the roller into engagement with successive pairs of veneers to maintain firm engagement between the upper-surfaces thereof and the under-surface of the reservoir, and means for controlling the discharge of the glue from said orifice, including a normally closed discharge valve and means for opening the same, including means responsive to the bodily movement of said roller out of the path of the veneer for opening the valve.

4. A machine for the edge-wise gluing of veneer, comprising a worktable providing a surface along which pairs of veneers may be moved abreast in coplanar, closely spaced apart relation, means for so moving the veneers, a reservoir positioned above said worktable and having a substantially flat bottom portion disposed in spaced parallel relation with and above the surface over which the veneers are moved, said reservoir having a glue discharge orifice in said flat bottom portion disposed above and in alignment with the space between said veneers, and means for maintaining the veneers in firm engagement with the flat bottom portion of the reservoir on opposite sides of the discharge orifice as said veneers are moved with respect thereto including a presser roller mounted beneath the worktable for rotation about an axis transverse to the direction of travel of the veneer, means mounting said roller for bodily movement transversely of the plane of said worktable surface and across the path of movement of said veneer, spring means resiliently urging the periphery of the roller into engagement with successive pairs of veneers to maintain firm engagement between the upper-surfaces thereof and the under-surface of the reservoir, means for controlling the discharge of the glue from said orifice and converging rollers disposed rearwardly of said discharge orifice in the line of movement of said veneers and arranged to engage successive pairs of veneers and move the respective veneers laterally towards each other thereby closing the space and causing the edge-wise gluing together of said veneers.

5. A machine for the edge-wise gluing of veneer, comprising a worktable providing a surface along which pairs of veneers may be moved abreast in coplanar, closely spaced apart relation, means for so moving the veneers, a reservoir positioned above said worktable and having a substantially flat bottom portion disposed in spaced parallel relation with and above the surface over which the veneers are moved, said reservoir hav-

ing a glue discharge orifice in said flat bottom portion disposed above and in alignment with the space between said veneers, and means for maintaining the veneers in firm engagement with the flat bottom portion of the reservoir on opposite sides of the discharge orifice as said veneers are moved with respect thereto including a presser roller mounted beneath the worktable for rotation about an axis transverse to the direction of travel of the veneer, means mounting said roller for bodily movement transversely of the plane of said worktable surface and across the path of movement of said veneer, spring means resiliently urging the periphery of the roller into engagement with successive pairs of veneers to maintain firm engagement between the upper-surfaces thereof and the under-surface of the reservoir, means for controlling the discharge of the glue from said orifice and converging rollers disposed rearwardly of said discharge orifice in the line of movement of said veneers and arranged to engage successive pairs of veneers and move the respective veneers laterally towards each other thereby closing the space and causing the edge-wise gluing together of said veneers, and pressure rollers beyond said converging rollers arranged to engage said veneers and maintain them in edge-to-edge relation during the initial drying of the glue.

6. A machine for the edge-wise gluing of veneer, comprising a worktable providing a surface along which pairs of veneers may be moved abreast in coplanar, closely spaced apart relation, means for so moving the veneers, a reservoir positioned above said worktable and having a substantially flat bottom portion disposed in spaced parallel relation with and above the surface over which the veneers are moved, said reservoir having a glue discharge orifice in said flat bottom portion disposed above and in alignment with the space between said veneers, and means for maintaining the veneers in firm engagement with the flat bottom portion of the reservoir on opposite sides of the discharge orifice as said veneers are moved with respect thereto including a presser roller mounted beneath the worktable for rotation about an axis transverse to the direction of travel of the veneer, means mounting said roller for bodily movement transversely of the plane of said worktable surface and across the path of movement of said veneer, spring means resiliently urging the periphery of the roller into engagement with successive pairs of veneers to maintain firm engagement between the upper-surfaces thereof and the under-surface of the reservoir, means for controlling the discharge of the glue from said orifice and converging rollers disposed rearwardly of said discharge orifice in the line of movement of said veneers and arranged to engage successive pairs of veneers and move the respective veneers laterally towards each other thereby closing the space and causing the edge-wise gluing together of said veneers, and pressure rollers beyond said converging rollers arranged to engage said veneers and maintain them in edge-to-edge relation during the initial drying of the glue and means for discharging a fluid drying medium over the glued edge joint of said veneers while held by said pressure rollers.

7. A machine for the edge-wise gluing of veneer, comprising a worktable providing a surface along which pairs of veneers may be moved abreast in coplanar, closely spaced apart relation, means for so moving the veneers, a reser-

voir positioned above said worktable and having a substantially flat bottom portion disposed in spaced parallel relation with and above the surface over which the veneers are moved, said reservoir having a glue discharge orifice in said flat bottom portion disposed above and in alignment with the space between said veneers, and means for maintaining the veneers in firm engagement with the flat bottom portion of the reservoir on opposite sides of the discharge orifice as said veneers are moved with respect thereto including a presser roller mounted beneath the worktable for rotation about an axis transverse to the direction of travel of the veneer, means mounting said roller for bodily movement transversely of the plane of said worktable surface and across the path of movement of said veneer, spring means resiliently urging the periphery of the roller into engagement with successive pairs of veneers to maintain firm engagement between the upper-

5 surfaces thereof and the under-surface of the reservoir, means for controlling the discharge of the glue from said orifice and converging rollers disposed rearwardly of said discharge orifice in the line of movement of said veneers and arranged to engage successive pairs of veneers and move the respective veneers laterally towards each other thereby closing the space and causing the edge-wise gluing together of said veneers, and 10 pressure rollers beyond said converging rollers arranged to engage said veneers and maintain them in edge-to-edge relation during the initial drying of the glue and means for discharging a fluid drying medium over the glued edge joint of said veneers while held by said pressure rollers 15 including a source of fluid drying medium, and a normally closed discharge valve, together with valve actuating means engaged by said veneers for opening said valve.

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