March 11, 1952 L. QUICK 2,588,874

GLUE APPLYING MACHINE FOR GLUE PRESSES

Filed April 3, 1947 4 Sheets-Sheet 1

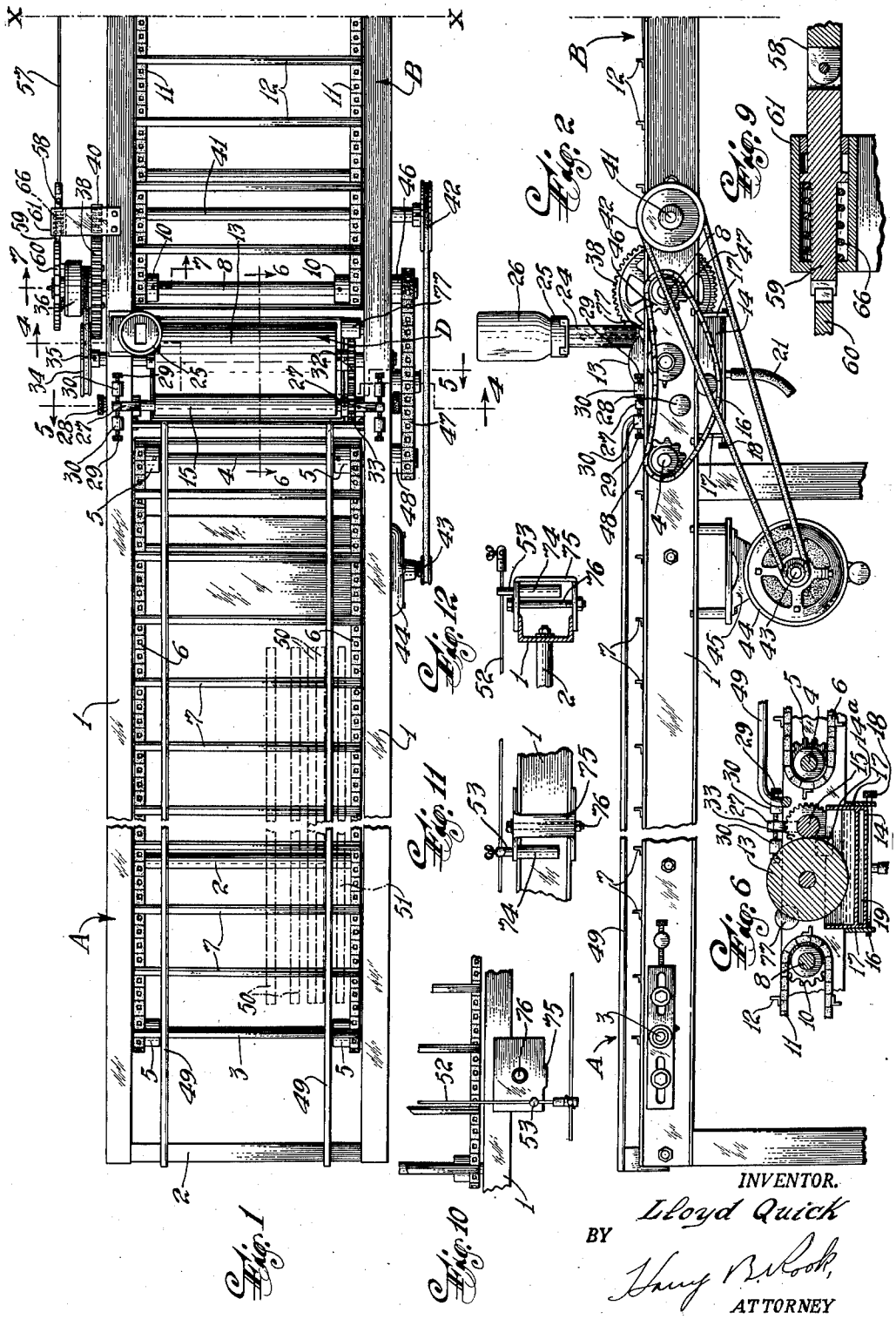


Fig. 1

Fig. 2

Fig. 9

Fig. 12

Fig. 11

Fig. 6

Fig. 10

INVENTOR.
Lloyd Quick
BY
Harry B. Cook,
ATTORNEY

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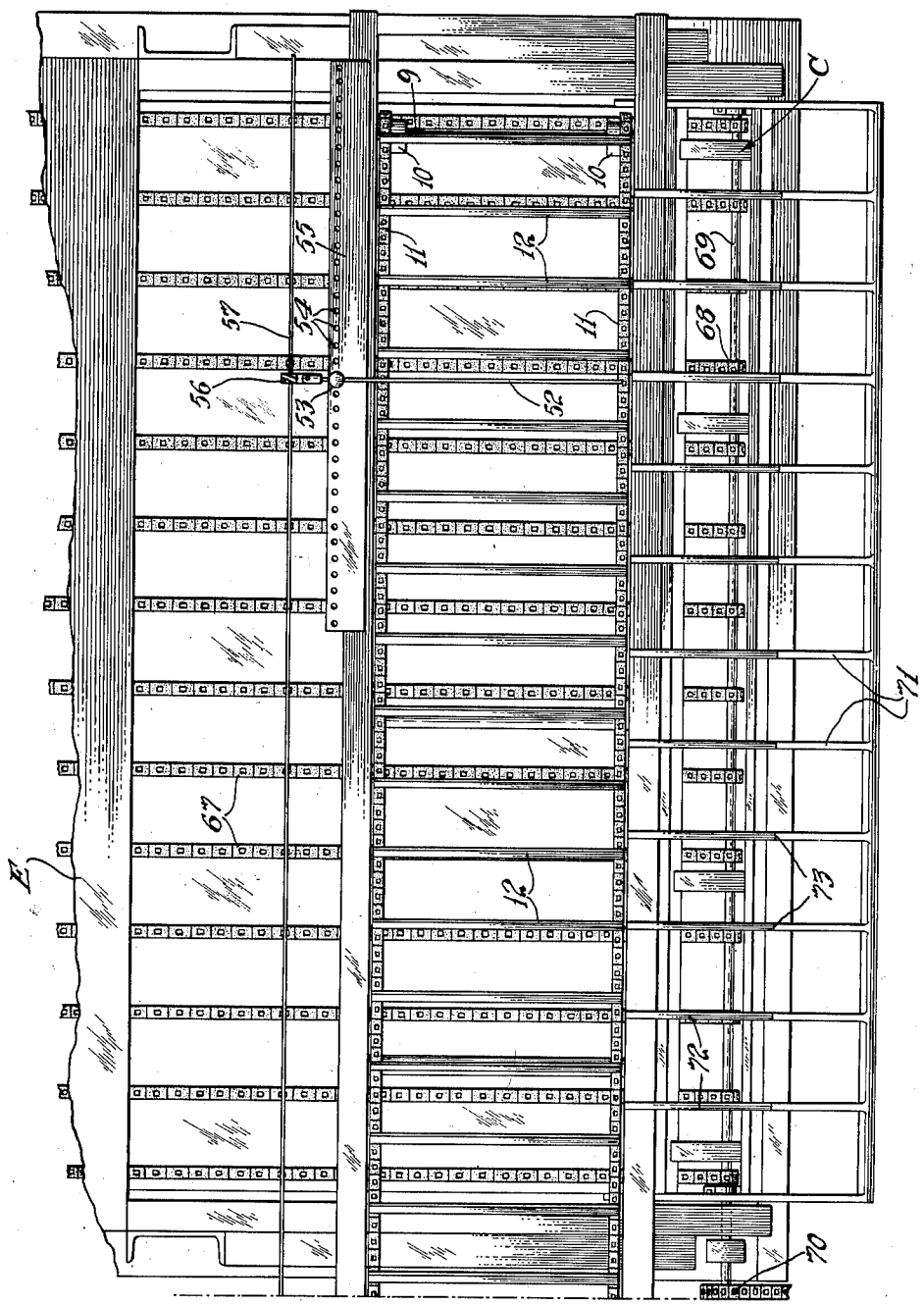


Fig. 1a

INVENTOR.
Lloyd Quick
BY
Harry B. Cook,
ATTORNEY

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GLUE APPLYING MACHINE FOR GLUE PRESSES

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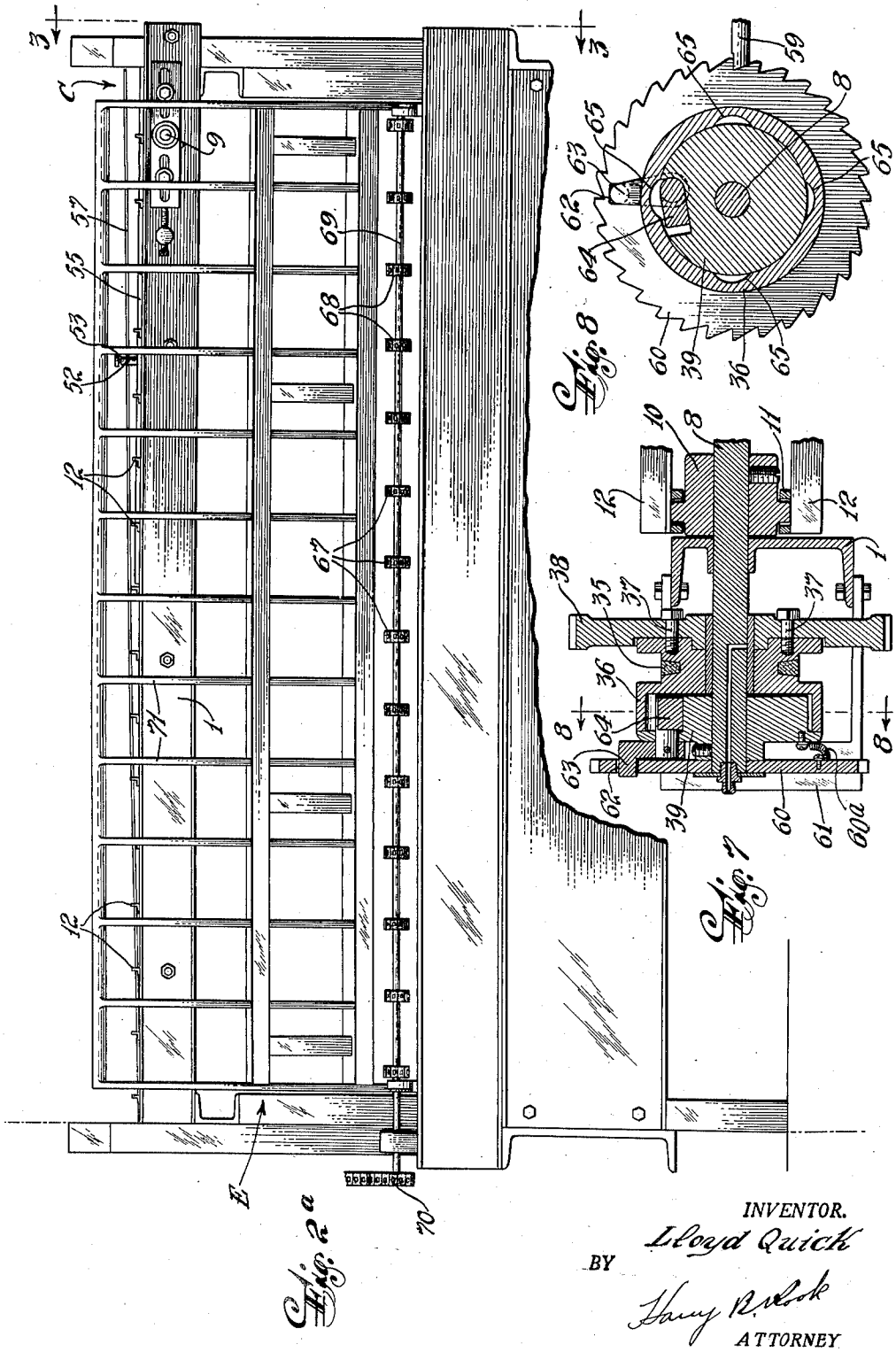


Fig. 2a

Fig. 8

Fig. 7

INVENTOR.
Lloyd Quick
BY
Harry R. Cook
ATTORNEY

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4 Sheets-Sheet 4

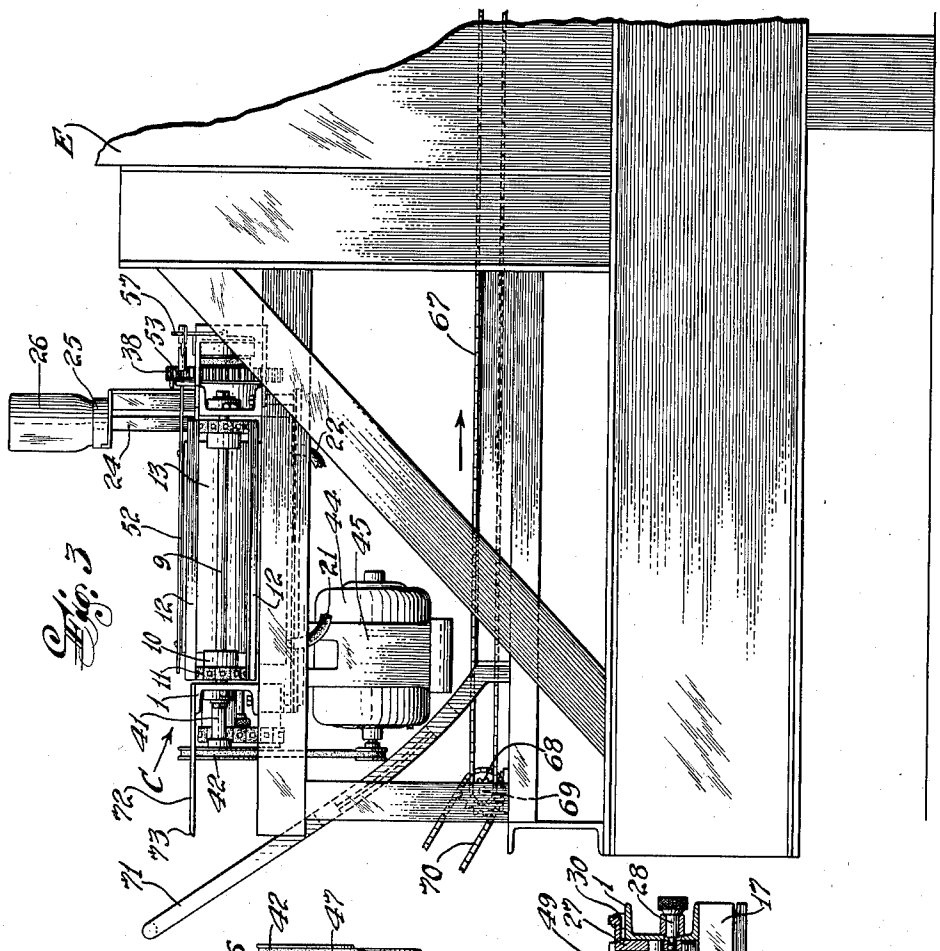


Fig. 3

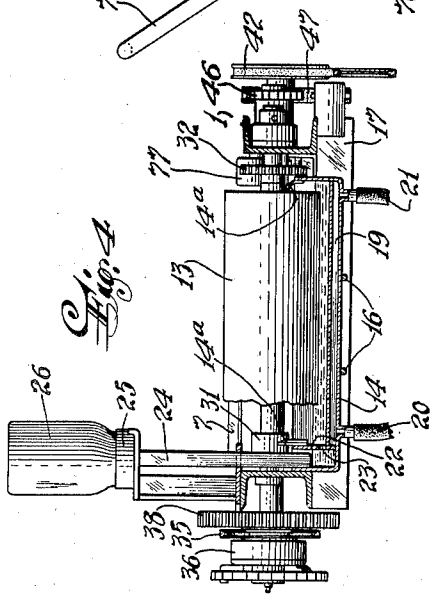


Fig. 4

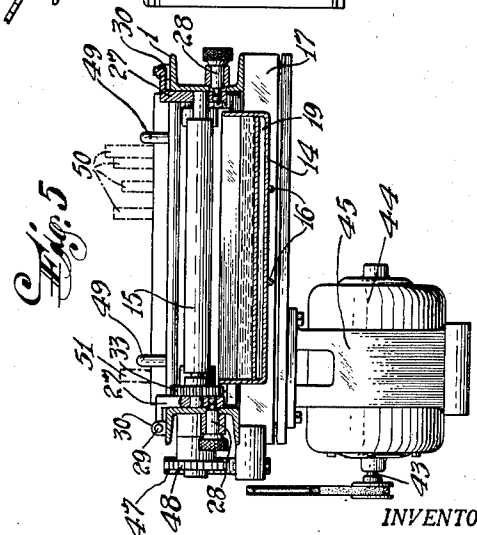


Fig. 5

INVENTOR.
Lloyd Quick
BY
Harry D. Cook,
ATTORNEY

Patented Mar. 11, 1952

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UNITED STATES PATENT OFFICE

2,588,874

GLUE APPLYING MACHINE FOR GLUE PRESSES

Lloyd Quick, Poughkeepsie, N. Y., assignor to James L. Taylor Manufacturing Company, a corporation of New York

Application April 3, 1947, Serial No. 739,235

4 Claims. (Cl. 118—1)

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This invention is related to those described in my copending application Serial No. 604,122, filed July 10, 1945, now Patent No. 2,537,279, and in United States Patent No. 2,408,064, dated September 24, 1946, and is particularly concerned with an apparatus for applying glue to objects, such as to the edges of thin boards which are to be united into a composite panel, and thereafter feeding the glued boards to a glue press in which they are glued together.

In my aforesaid application I have disclosed a conveyor system which comprises a loading or feeding portion and an unloading or take-off portion between which is a glue-applying unit, whereby fresh glue can be continuously and automatically applied to objects, such as pieces of lumber, during their movement from the feeding portion to the take-off portion without any wiping action between the objects or pieces of lumber and the conveyor system or the glue-applying unit that would prevent application of glue to the objects or cause an uneven application of glue to the objects, or accumulation of glue on the conveyor.

In United States Patent No. 2,408,064 is disclosed a glue press for gluing together objects, such as thin boards, to which glue has been previously applied by a gluing machine of the type above described.

Before my present invention, it was necessary for an operator to manually lift the glue-coated boards from the take-off portion of the conveyor system and turn ninety degrees (90°) or one hundred eighty degrees (180°), depending upon the length of the boards, in order to place said boards on the feeding conveyor of the glue press, which is a cumbersome, tedious and tiresome operation.

Therefore, one object of my present invention is to provide a novel and improved combination of such a glue-applying mechanism and a feeding conveyor for a glue press, so that movement of the glue-coated boards by the take-off portion of the glue-applying mechanism, can be automatically stopped in predetermined relation to the feeding conveyor of the glue press and the boards can be slid manually laterally from said take-off portion and deposited by gravity onto said feeding conveyor, thereby reducing the time, confusion and labor incident to transfer of the glue-coated boards to the glue press.

Further objects are to provide in apparatus of the character described, novel and improved means actuated by the boards for automatically stopping the take-off portion of the glue-applying mechanism; and to provide novel and improved means for adjusting said automatic stopping means to accommodate boards of different lengths.

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Other objects of the invention are to provide a novel construction, combination and arrangement of parts which shall be simple and reliable, and to obtain other advantages and results as will be brought out by the following description in conjunction with the accompanying drawings, in which

Figure 1 is a top plan view of one end portion of the apparatus constructed in accordance with the invention;

Figure 1*a* is a plan view of the other end portion of the apparatus beyond the dot and dash line X—X of Figure 1;

Figure 2 is a side elevational view of a portion of the apparatus shown in Figure 1;

Figure 2*a* is a side elevational view of a portion of the apparatus shown in Figure 1*a*;

Figure 3 is an end elevational view of the apparatus, observing the same from the plane of the line 3—3 of Figure 2*a*;

Figure 4 is a transverse vertical sectional view, on the line 4—4 of Figure 1;

Figure 5 is a similar view, on the line 5—5 of Figure 1;

Figure 6 is a fragmentary vertical longitudinal sectional view, on the line 6—6 of Figure 1;

Figure 7 is a transverse vertical sectional view, on the line 7—7 of Figure 1;

Figure 8 is a vertical sectional view, on the line 8—8 of Figure 7;

Figure 9 is an enlarged fragmentary horizontal sectional view of the mounting bracket for the pawl pin of the clutch mechanism;

Figure 10 is a fragmentary top plan view of a modified mount for the stopping lever of the conveyor system;

Figure 11 is a front elevational view thereof, and

Figure 12 is a side elevational view of said mount.

In general, the apparatus includes a glue-applying mechanism which comprises a conveyor system having a feed or loading portion A and a take-off or unloading portion B, the latter being juxtaposed to the feeding conveyor mechanism C of a glue press. The feed and take-off portions A and B are horizontally spaced apart and a glue-applying unit D is interposed between them.

The conveyor system includes a frame having side bars 1 which are connected by cross-bars 2, and the feeding portion A includes two shafts 3

and 4 journaled in the frame and each carrying a pair of sprockets 5 over which pass endless chains 6. Cross-bars 7 are secured to and extend transversely between the sprocket chains 6 to support boards to be coated, said bars preferably having thin outer edges to ensure minimal contact with the boards.

The take-off portion B similarly includes shafts 8 and 9 journaled in the frame and carrying sprockets 10 over which run sprocket chains 11 which carry bars 12 similar to the bars 7. Preferably, the feed portion and the take-off portion of the conveyor system are so arranged that the upper edges of the bars 7 and 12 on the upper reaches of the chains will be in substantially the same horizontal plane.

The glue-applying unit D includes a glue applicator roll 13 also journaled in the side bars 1 of the frame, a glue pot 14 and a doctor roll 15. The glue pot is removably supported on the frame by rods 16 removably inserted through apertures in transverse bars or hangers 17 which are welded or otherwise suitably secured to the undersides of the side bars 1 of the frame. Preferably, one end of each of the rods is screw threaded to fit a threaded opening in the corresponding bar 17, while the other ends of the rods have finger pieces or knobs 18. Preferably, a jacket 19 with inlet and outlet openings 20 and 21 is provided on the glue pot for the circulation of heating or cooling medium to warm or cool the glue within the pot. The pot also has a partition 22 formed with an aperture 23 to provide a well into which extends a vertical tube 24 that depends from a socket 25 in which is supported a suitable supply container 26 for the glue. With this construction, a uniform level of glue in the pot will be assured.

In normal operation of the apparatus, the glue applicator roll 13 dips into the glue in the pot so that the periphery of the roll picks up some of the glue as the roll rotates, and the doctor roll 15 controls the thickness of the film or layer of glue on the roll 13. The doctor roll is provided with mounting means whereby its position with respect to the roll 13 may be changed, and as shown, the doctor roll is mounted in swinging bearings 27 which are pivotally mounted in the respective frame bars 1 by means of screws 28 each of which has one end thereof threaded into an aperture in the corresponding arm and has an enlarged knurled head in its other end for ease of operation. Preferably, resilient scrapers 14a are secured to the end walls of the glue pot to engage the ends of the glue roll 13, both for preventing accumulation of glue on the ends of the roll and also for centering the glue pot laterally of the frame. The bars 17 position the glue pot longitudinally of the frame. For adjusting the doctor roll two adjusting screws 29 are mounted in blocks 30 on the frame bars 1, one at each side of each of the swinging bars 27, whereby the position of the doctor roll can be micrometrically adjusted and the amount of glue on the roll 13 can be precisely controlled or varied.

This construction also permits easy and quick removal of the doctor roll and the glue pot for cleaning or inspection. To remove the doctor roll, it is merely necessary to unscrew the screws 28 until their shanks are withdrawn from the apertures in the bearings 27, whereupon the doctor roll and the bearings can be lifted vertically upwardly from between the frame bars 1 without disturbing or altering the seating of the roll which was effected by the adjusting screws 29. The glue pot 14 can be readily lowered and removed by unscrewing the rods 16 and pulling them from beneath the glue pot.

The glue-applying roll is journaled in bearings 31 in the side bars 1, so that the highest point on its periphery projects slightly, for example, three-sixteenths ($\frac{3}{16}$) inch to one-fourth ($\frac{1}{4}$) inch, above the top edges of the cross-bars 7 and 12, and the shaft of the glue roll 13 carries a gear 32 which meshes with a pinion 33 on the shaft of the doctor roll whereby the doctor roll can be driven from the glue-applying roll.

In accordance with the invention, the glue-applying roll is driven so that its periphery travels at the same speed as the feed and take-off portions of the conveyor mechanism, and as shown, the shaft of the glue-applying roll projects beyond one of the frame bars and has a pulley 34 connected by a belt 35 to a clutch element 36 which is rigidly secured, as by bolts 37, to a gear 38 which is mounted for free rotation on the conveyor shaft 8 that is journaled in the frame bars 1 and 2. The gear 38 meshes with a driving pinion 40 on a driving shaft 41 also journaled in the frame and having a belt and pulley connection 42 with the shaft 43 of an electric motor 44 which is suspended in a bracket 45 from the underside of the frame. The conveyor shaft 8 is driven from the drive shaft 41, pinion 40 and gear 38, and through the clutch element 36 and a cooperating clutch member 39 drives the take-off portion of the conveyor system. The feed portion of the conveyor system is driven through a sprocket 46 on the shaft 8 over which runs a chain 47 which also is connected to a sprocket 48 on the conveyor shaft 4.

In normal operation of the machine, when the motor is running, the feed portion A and the take-away portion B of the conveyor system, and the glue-applying roll 13 are driven in the same direction so as to carry objects, such as boards placed on the feed portion of the conveyor, into contact with and over the glue-applying roll and thence onto the take-away portion of the conveyor which carries the boards to a discharge point. A separator rail 49 extends from the entrance or feeding end of the feed portion A to a point adjacent the glue-applying roll and outwardly beyond one end thereof so that a series of boards 50 may be placed in side by side relation on the bars 7 of the feed portion with another board 51 at the outside of said separator rail, whereby all of the boards except the one outside said rail will have glue applied thereto by the glue-applying roll 13. Generally, these boards are utilized to form one complete panel in a glue press, and the unglued board 51 produces one unglued joint when the edges of successive boards are passed against each other in the gluing operation. Therefore, each time a dry or unglued joint occurs it interrupts the production of a continuous ribbon of glued boards and thus determines the width of each glued panel. As shown in the drawings, there is a separator rail at each side of the feed portion of the conveyor. To facilitate movement of short unglued boards from the feed portion to the take-away portion of the conveyor one or more idler rollers 77 may be provided.

The operator may take a group of boards sufficient to make one composite panel and place them on edge on the cross-bars 7 with one board 51 outside the separator rail 49, as best shown in Figures 1 and 5 by dot and dash lines. The movement of the cross-bars carries the boards

along until they contact the glue roll 13 which, because it projects above the cross-bars, carries the boards toward the glue roll and delivers them to the cross-bars 12 of the take-off portion B. With this arrangement, the roll 13 acts as an integral part of the conveyor system and ensures complete application of glue not only because the weight of the boards presses them down onto the roll but because the roll construction and disposition applies glue even to "hollow jointed" boards which are boards with a longitudinal curvature. Also, because the peripheral speed of the glue roll is the same as the linear speed of movement of the conveyor portions A and B, there is no relative movement of the conveyor bars and the boards nor is there any wiping action between the surface of the glue roll and the edges of the boards, so that an even application of glue to the boards is ensured and the possibility of wiping or removal of the glue from the boards or uneven thickness of the glue coating, is obviated, as is also accumulation of glue on the conveyors.

When the boards 50 reach a predetermined point on the take-away portion of the conveyor system, the forward ends of the boards strike a stop arm 52 which actuates the clutch 36, 39 to stop the feed and take-away conveyors. As shown, this stop arm is secured in a post 53 which may be pivotally mounted in any one of a plurality of openings 54 in a supporting bracket 55 which is secured to one of the side bars 1 of the frame. One end of the stop arm overlies the upper reach of the take-off conveyor portions slightly above the tops of the bars 12, while the other end of the stop arm projects beyond the post 53 and has adjustably connected thereto by a screw 56, a push rod 57 which is pivotally connected at 58 to a pawl pin 59 which cooperates with a ratchet 60 that has an opening 62 in which is pivotally fitted an actuating arm 63 of a clutch dog 64 that is pivotally mounted on the clutch member 39 to connect and disconnect the latter from the clutch element 36 which has notches 65 to interlock with the dog 64. A spring 60a normally influences the ratchet 60 to hold said dog engaged with the element 36. The pawl pin 59 is slidably mounted in a bracket 61 and is normally influenced away from the ratchet 60 by a spring 66. When the ends of the boards on the take-off conveyor portion strike the stop arm 52, the latter is swung so as to actuate the push rod 57 and cause engagement of the pawl pin with the ratchet 60, whereby the dog 64 is disengaged from the clutch element 36. The clutch member 39 is thus stopped and being fixedly connected on the shaft 8, both the feed and take-off conveyor portions are also stopped. However, the glue-applying roll may continue to rotate to keep the glue agitated. When the boards are removed from engagement with the stop arm, the conveyor portions will be automatically started.

The take-off conveyor portion and the stop arm 52 are so related to the receiving opening or the loading station of a glue press that the glue-coated boards will be automatically stopped in proper position for easy manual sliding of the boards from the take-off portion and deposit thereof into said loading station or receiving opening upon a conveyor mechanism or a loading table. In Figures 1a, 2a and 3 of the drawings, the reference character E represents the frame of a glue press or other machine, for example, a glue press of the type disclosed in United States Patent No. 2,408,064, which includes the conveyor mechanism C. Any suitable type of conveyor mechanism may be used, but as shown conveyor chains 67 extend from the receiving end of the glue press and pass over sprockets 68 on a shaft 69 which may be driven in any suitable manner as by a chain and sprocket drive 70. A receiving guide frame 71 projects diagonally upwardly from the conveyor chains 67 to a point in spaced relation to one side bar 1 of the frame of the glue-applying mechanism so as to form receiving openings for the glue-coated boards between said receiving guide frame and the glue-applying machine. Guide arms 72 are secured to said side bar 1 and extend horizontally outwardly therefrom with their outer ends terminating at 73 so as to leave between them a space adequate for the passage of glue-coated boards. The conveyor chains 67 move in the direction of the arrow in Figure 3 at right angles to the direction of travel of the take-off conveyor portion, and are disposed directly beneath the latter.

In operation, the stop arm 52 is set by adjusting its post 53 in the proper opening 54 so that the glue-coated boards will be stopped with the whole length thereof above the conveyor chains 67. Thereupon, the operator standing alongside the receiving guide 71 will reach inwardly and pull the glue coated boards toward him over the guide arms 72 and then drop the boards by gravity onto the receiving guide which will carry them to the conveyor chains 67. These chains will then convey the boards to the pressing and drying mechanism of the glue press E. It will thus be seen that the boards can be placed on the feed portion of the glue-applying mechanism and the glue-coated boards can be removed from the take-off portion of the glue-applying mechanism about as fast as an operator can handle the boards, and the glue-coated boards can be deposited as fast as the operator can handle them directly into the feeding conveyor mechanism of a glue press or the like.

Figures 10, 11 and 12 show a modification of the adjustable mounting for the stop arm 52. Here the post 53 is rotatably mounted in a socket 74 which is carried by a U-shaped bracket 75, the arms of which embrace one of the side bars 1 and are tightly clamped in frictional contact therewith by a bolt 76. By loosening the bolt 76 so as to relieve the pressure of the arms of the bracket on the side bar 1, the bracket 75 can be slid along the side bar to locate the stop arm in the desired position.

While I have shown the machine as embodying certain details of construction, it should be understood by those skilled in the art that many changes can be made in the machine, and other relationships of the glue-applying mechanism and the feeding conveyor mechanism of the glue press or the like can be utilized, all within the spirit and scope of the invention.

Having thus described the invention, what I claim is:

1. A glue-applying machine comprising a glue-applying unit having a movable glue-carrying surface, a conveyor system for objects to be glued having feed portions and take-off portions disposed at opposite sides of said glue-carrying surface and movable in the same direction so that said objects are moved into and out of contact with said glue-carrying surface by said feed and take-off portions, respectively, driving means for both said conveyor portions, mechanism including a movable part actuated by said objects on said take-off portion for automatically stopping

said conveyor portions, and means mounting said movable part for adjustment relatively to said take-off portion to cause said stopping at a selected point.

2. The glue-applying machine as defined in claim 1, with the addition of means normally influencing said mechanism to cause starting of said conveyor portions when said objects are moved out of engagement with said movable part.

3. Apparatus of the character described, comprising a frame, a glue-applying unit thereon, a conveying system including feed and take-off portions on said frame at opposite sides of said glue-applying unit for moving to and from said glue-applying unit, driving means for said conveying system, mechanism to stop said driving means including a movable part to be engaged and actuated by objects on said take-off portion, means mounting said part on said frame for adjustment longitudinally of said take-off conveyor portion.

4. Apparatus of the character described, comprising a frame, a glue-applying unit thereon, a conveying system including feed and take-off portions on said frame at opposite sides of said glue-applying unit for moving to and from said glue-applying unit, driving means for said conveying system, mechanism to stop said driving means including a movable part to be engaged and actuated by objects on said take-off portion, a pivot member for said part, and means for mounting said pivot member on said frame at different points longitudinally of said take-off portion.

LLOYD QUICK.

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