

Nov. 4, 1952

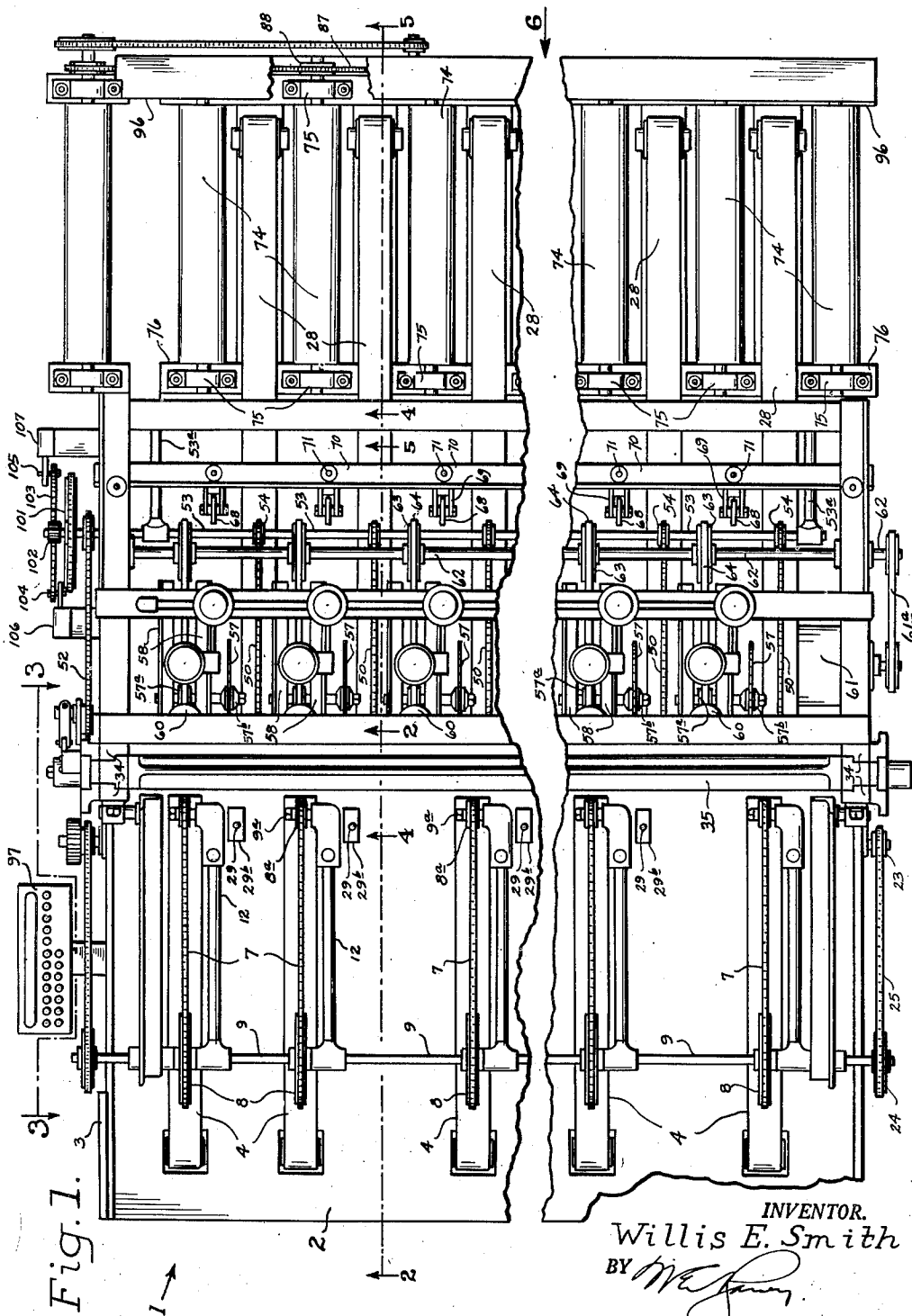
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2,616,501

COMBINED VENEER CLIPPER AND TRIMMER

Filed Nov. 12, 1947

7 Sheets-Sheet 1



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Nov. 4, 1952

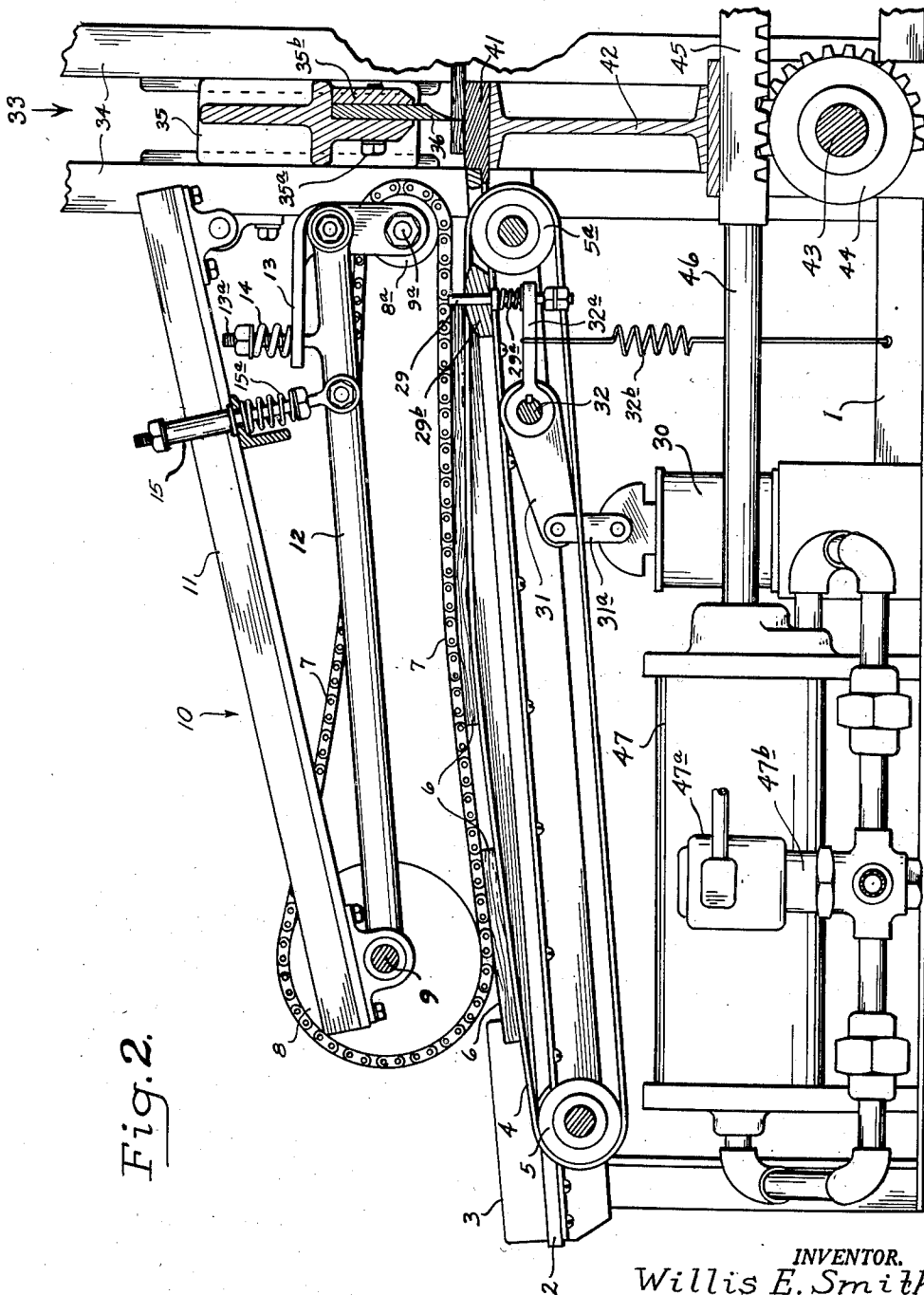
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COMBINED VENEER CLIPPER AND TRIMMER

Filed Nov. 12, 1947

7 Sheets-Sheet 2



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COMBINED VENEER CLIPPER AND TRIMMER

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7 Sheets-Sheet 3

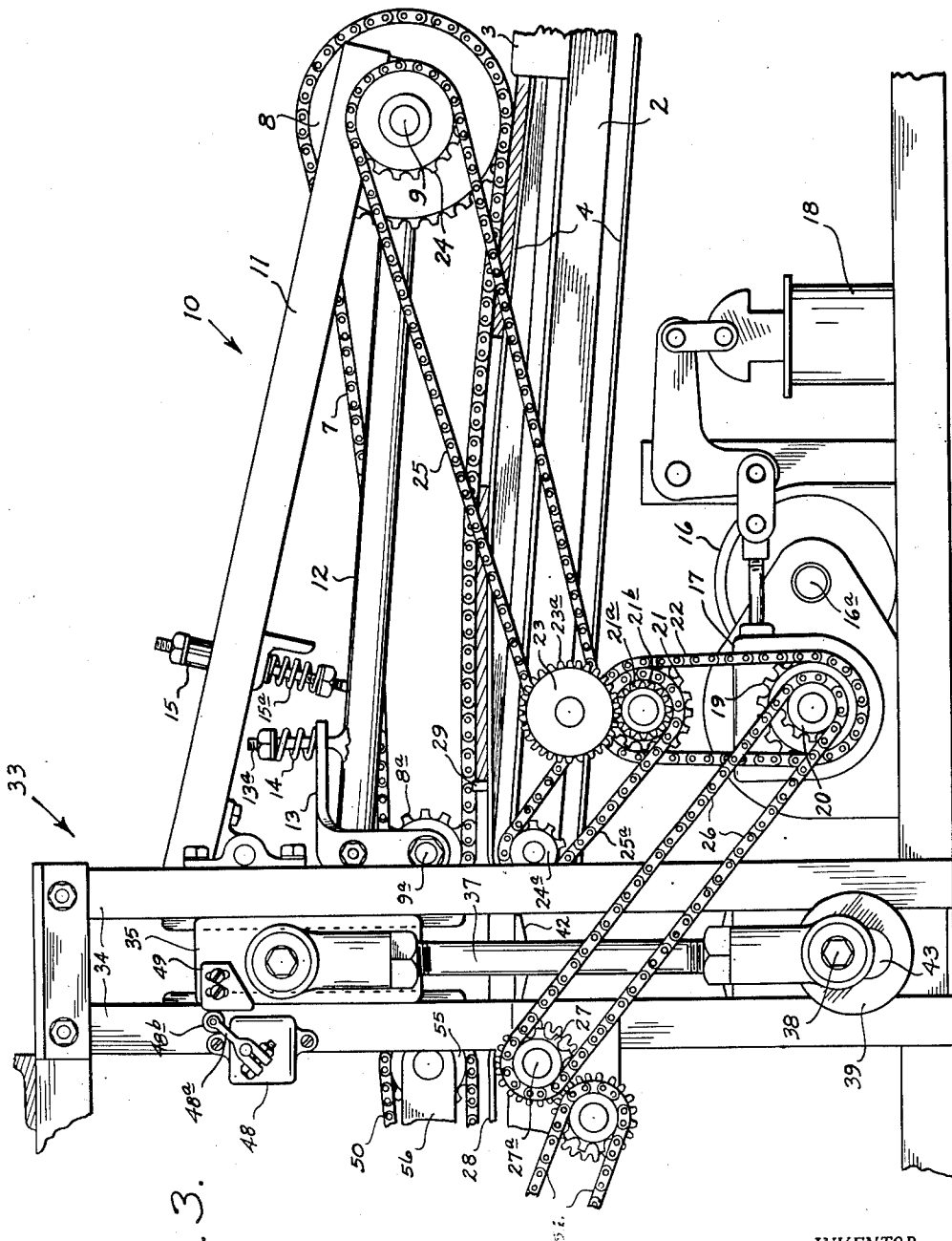


Fig. 3.

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COMBINED VENEER CLIPPER AND TRIMMER

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7 Sheets-Sheet 4

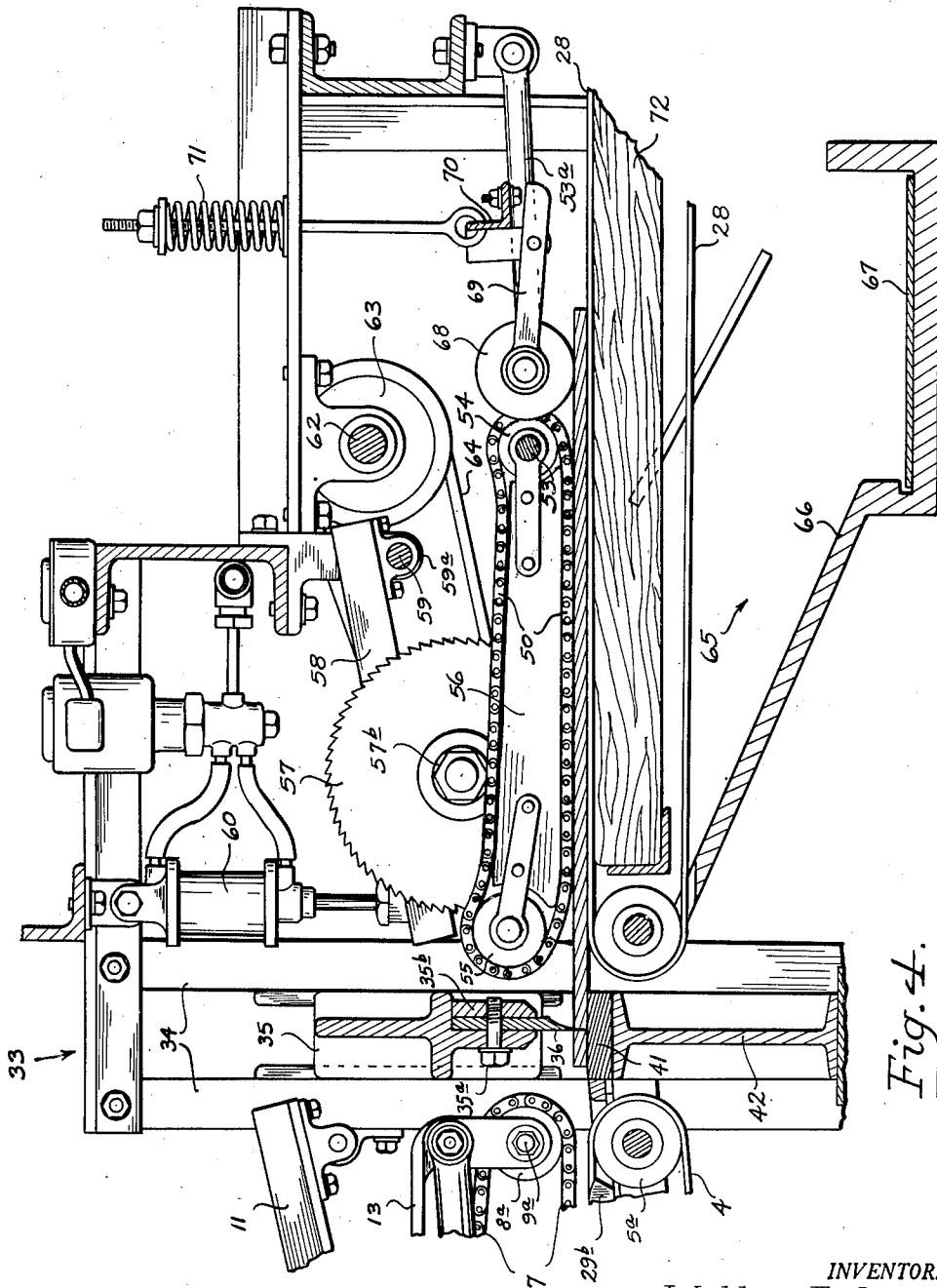


Fig. 4.

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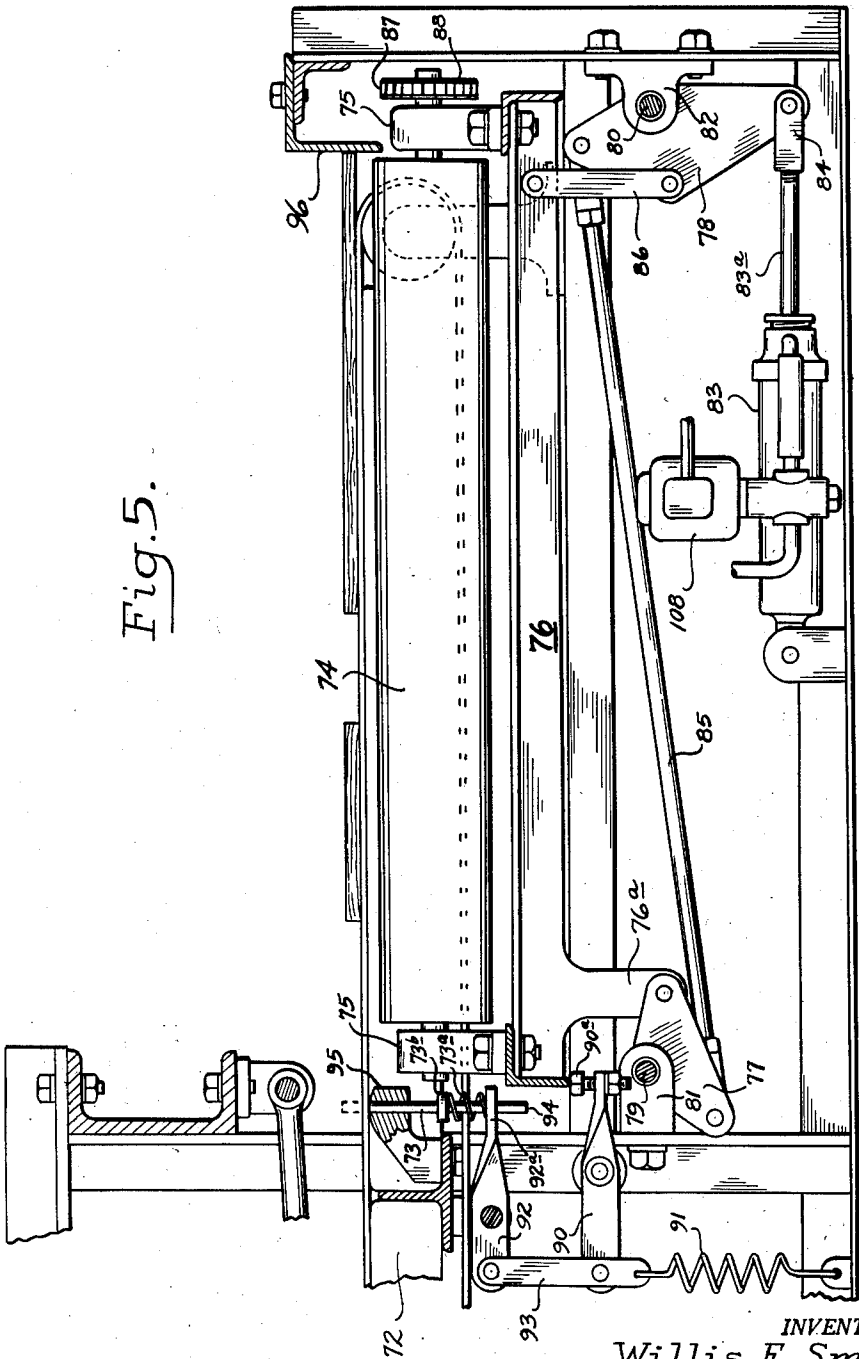
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COMBINED VENEER CLIPPER AND TRIMMER

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7 Sheets-Sheet 5

Fig. 5.



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COMBINED VENEER CLIPPER AND TRIMMER

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7 Sheets-Sheet 6

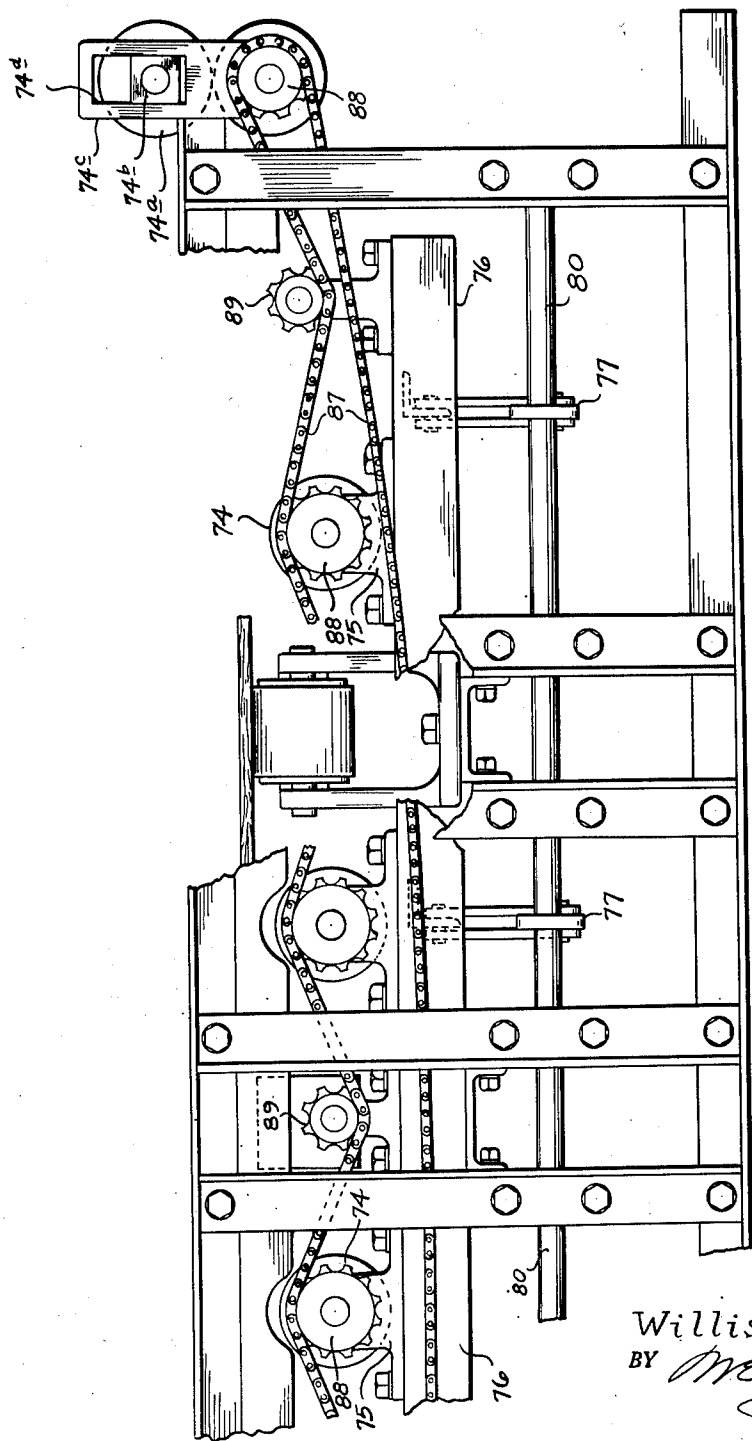


Fig. 6.

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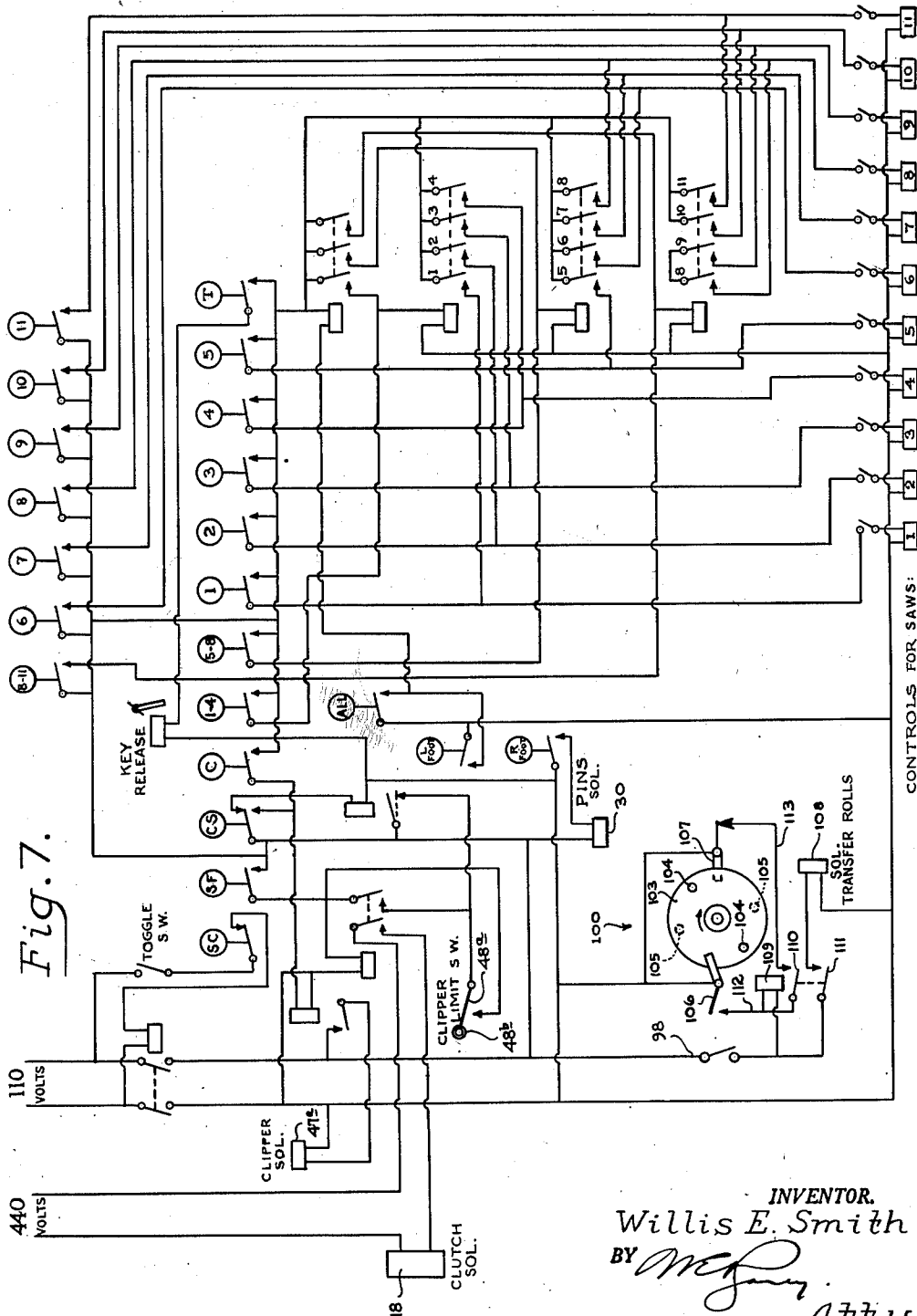
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COMBINED VENEER CLIPPER AND TRIMMER

Filed Nov. 12, 1947

7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

2,616,501

COMBINED VENEER CLIPPER AND TRIMMER

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Application November 12, 1947, Serial No. 785,487

4 Claims. (Cl. 164—48)

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My invention relates to the making of plywood and has particular reference to the recovery of useful sections from the separate sheets which go to make up plywood which otherwise would be rejected and unused. At the present time, it is common practice to peel from a log a continuous strip or sheet of wood of desired thickness. This is usually about one-eighth of an inch thick in the Douglas fir plywood industry. Because of the presence of defects, such as knots, pitchpockets, unequal surfaces, and the natural breaking of wood, the recovery of useful sheets from said strip is relatively inefficient. Also, if sections or panels of plywood are being constructed, it has been the practice only to utilize the full length of the bolt or log being peeled. Any sheets which do not extend the full length are rejected and diverted on to the scrap pile, because it is not economical to separate them, stack them, and return them to produce shorter panels.

The object of my invention is to provide a single machine which will efficiently and economically clip and saw selected portions from said strips so that they can be recovered and used, either to make plywood panels of maximum length or be used to make panels which are standard but are of shorter length than the full length of the bolt or log being peeled.

A further and more specific object of my invention is to provide a machine of this character which will accommodate successive sheets of plywood independently of their length or width and independently of the outline or imperfections thereof.

A further object of my invention is to provide a machine in which sheets having imperfections may be fed in only approximate alignment, and which will be automatically squared in the machine so as to produce rectangular panels.

A further object of my invention is to provide a machine of this character which will permit sheets to be fed into the machine manually, will automatically square them with the delivery chains, saws, and clipper blades, will space them apart in said machine so as to permit them to be selectively operated upon, will separate the good portions of said panels, and will automatically discharge the rejected portions.

A further object of my invention is to provide a machine in which the feeding mechanism will automatically stop under the clipper as it strikes a descending blow and then moves again to inoperative position. Due to said interruption of motion, the shearing is clean, the sheets being clipped are not crumpled or broken, said sheets

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are retained square to the clipped edge and may pass from said clipper to trimming saws, maintaining their rectangular shape, and be discharged with other reclaimed sections of the sheets of plywood, separate from the rejected trimmed and imperfect portions of the sheets, being thus selectively recovered or retrieved.

The details of my invention and the mode of operation thereof are hereinafter described with reference to the accompanying drawings, in which:

Fig. 1 is a plan view of a machine embodying my invention, said machine being shown fore-shortened longitudinally thereof;

Fig. 2 is a longitudinal section through the forward end of said machine, being taken on the line 2—2 in Fig. 1;

Fig. 3 is more or less a side elevation of said forward end of the machine, being taken on the line 3—3 in Fig. 1;

Fig. 4 is a longitudinal section taken through the middle portion of said machine on the line 4—4 in Fig. 1, being a prolongation of the section line 2—2 on which Fig. 2 is taken;

Fig. 5 is a longitudinal section taken on the line 5—5 in Fig. 1, being a prolongation of the section line 4—4 upon which Fig. 4 is taken;

Fig. 6 is an end view taken in the direction of the arrow 6 in Fig. 1, portions being shown broken away to disclose details of construction; and

Fig. 7 is a diagrammatic illustration of the electrical connections for said machine, said diagram carrying legends for the purpose of explanation of said diagram.

A machine embodying my invention comprises an elongated frame 1, in which sheets or boards are fed in at the left edge, as shown in Fig. 1, and are discharged at the right side, as shown in said figure. At the inlet end is a feed table 2, having a shoulder or guide 3 on its upper edge, as viewed in said figure. This projects above the level of the upper surface of the feed table and is used by the men feeding sheets or plies to aline that end of said sheets or plies with the feed table, more or less. In the plywood industry at the present time, it is common practice to allow one-fourth inch for trim for each one foot of length. Thus close alinement and register need not be maintained through said machine. All that is essential is that the ends of the feed sheets or boards adjacent said shoulder or guide be in substantial abutment therewith, because it is from this edge that all computations are made.

Recessed in said feed table, but extending upwardly therefrom, are a series of endless feed

belts 4. These belts are spaced at more or less uniform intervals across the upper surface of said feed table. Said belts are quite wide and extend about pulleys 5—5a, rotatable upon axes lying below the surface of said feed table. The intake and discharge ends of said belts, as they are arranged with respect to the feed table, lie substantially in the plane of said feed table, as is shown in Fig. 2. The intermediate portions, however, rise above the plane of said feed table several times the thickness of said boards or plies 6, so that a secure grip may be had between said endless feed belts and overlying feed chains 7. Said feed chains are aligned with the underlying feed belts and also are of endless form. The chains engage sprockets 8—8a, which are journaled upon axles 9—9a, respectively, and spaced apart and are carried by a feed chain bracket 10. Said bracket comprises a structural member 11 at each end and stiffener bars 12, arranged adjacent each of the feed chains. A brace 13 of angular form is provided for each stiffener bar, and a compression spring 14, encircling an upstanding threaded pin 13a, resiliently holds each of said stiffening bars in proper relation with the feed table, so that the lower course of each of said feed chains will be arranged properly to engage boards or plies moved along by the feed belts 4. The structural member 11 at each end of said feed chain bracket also is resiliently supported intermediate a supporting spring 15a and a spacer 15. The principal function of said spacer 15 is to hold the sprockets 8a upwardly so that the feed chains 7 do not run over and gouge the feed belts as they pass over the pulleys 5a when there are no boards or plies to separate them.

Said chains and belts, as well as other mechanisms, are driven by a motor 16, Fig. 3, having a shaft 16a. A clutch 17 is provided for said motor and it is actuated by a solenoid 18. When the clutch is in engagement, the drive sprocket 19 is driven by the motor shaft 16a, but the sprocket 20 for driving the rearward feed chains lying at the discharge side of the cutter mechanism will be driven at all times, independently of said clutch, which will hereinafter be described. Intermediate sprockets 21—21a, being of step-down type, are operatively connected with the drive sprocket 19 by means of a chain 22. Said sprockets 21—21a also are provided with a gear 21b, which engages a gear sprocket arrangement 23—23a for the feed chains 7. That is, the gear 23a meshes with gear 21b on the sprockets 21—21a so as to drive the gear and sprocket arrangement 23—23a. A sprocket 24 is keyed to the axle 9, and thus when endless chain 25, engaging sprockets 23 and 24, is driven, it rotates the axle 9 and the sprockets 8 for the feed chains 7. The sprockets 8a idle on their stub shafts 9a. The sprocket 21a is joined to a sprocket 24a by a chain 25a, and drives the feed belts 4. A chain 26 engages the sprocket 20, as well as the sprocket 27 on shaft 27a for the rearward belts 28.

Referring now to Fig. 2: The boards or plies 6 are fed upwardly across the feed table 2 by being engaged between the endless feed belts 4 and the feed chains 7. Adjacent the discharge end of said feed belts and feed chains is a series of pins 29, which are retractable, one being arranged adjacent each of said pairs of belts and feed chains. Said pins are moved in unison by a solenoid 30, which engages a lever 31, on a rock shaft 32, through a link 31a. Said rock shaft 32 has a series of arms 32a keyed thereto,

and each of said pins is resiliently mounted upon a coil spring 29a. Said pins are moved upwardly to the position they occupy in Fig. 2, to engage the forward edge of a board or ply, and are retracted from said position by coiled spring 32b. Thus when the solenoid 30 is energized, the pins tend to be moved up into intercepting position with relation to the boards or plies, and when said solenoid is de-energized with relation to the boards or plies, spring 32b retracts said pins.

The springs 29a under each of said pins perform a very important function. If said pins tend to be moved upwardly by the action of the solenoid 30 and they underlie a board or ply, said springs will compress and said board or ply will not be pierced or broken by said pins. Immediately after said board or ply passes beyond the line of said pins, the spring under each of said pins will push it up into position where it will intercept the next board or ply. Said plies, particularly when they are one-eighth inch plywood, are rather fragile. It is necessary, however, that said pins be held in intercepting position quite securely, and this is accomplished without damage to the boards by the arrangement of said springs about the pins so that they are resiliently mounted. Said pins are prevented from moving laterally, and thus are held in exact alinement by bearing blocks 29b surrounding said pins. Said pins are arranged alongside the endless feed belts 4, as is shown in Fig. 1, and thus, in the absence of said bearing blocks, the boards or plies might sag and engage said pins inadvertently, even though they were retracted. By arranging said bearing blocks to encircle said pins when they are retracted, the upper surface of each of said blocks 29b provides a smooth, curved surface about a pin to prevent inadvertent engagement of said plies and boards, producing tearing or damage thereof, when said boards or plies are moved along by the feed belts 4 and the overlying feed chains 7.

Said boards or plies are preferably fed into the feed table so they will present a straight forward edge. The pins 29 are aligned, and thus when the boards strike said pins, they will tend to square them with the feed table. The feed chains drag lightly over the boards or plies and the latter merely rest upon the feed belts. Thus they are not unyieldingly engaged by said feed mechanism, and the belts and feed chains are permitted to drag over them to pull the boards or plies tightly against the pins to square them. Arranged at the discharge end of said feed belts and feed chains is a plywood clipper 33, as shown in Figs. 2 and 3. The clipper 33 comprises a pair of spaced vertical guide members 34 and a reciprocating head 35 carrying a sharpened blade 36. Said blade is secured to the head by bolts 35a, which pass through a backing or clamping plate 35b to hold the blade 36 flatwise against the head to maintain said blade in transverse alinement.

Referring now to Fig. 3 as well as to Fig. 2: Pitmans 37 are arranged at each end of said blade. A crank pin 38 on a crank disc 39 moves said head and the blade over and above a base plate 41 in the clipper. Said base plate preferably is solidly supported by an I-beam 42 or other type of structural support. The crank disc 39 is rotated by a rock shaft 43, to which a segmental pinion 44 is secured. An overrunning rack 45 operatively engages the segmental pinion 44 to oscillate said crank disc 39 and

to move the cutter blade 35 up and down. Said overrunning rack 45 is secured to the end of piston rod 46 of a reciprocating piston-and-cylinder element 47. Said piston-and-cylinder element 47 preferably has a throw sufficient to cause the crank disc to turn approximately 180 degrees. It may optionally, however, rock the rock shaft and the crank disc 360 degrees so that at each alternate stroke of the piston rod, the cutter blade will pass through one complete cutting stroke and be moved from the position above the plywood down to sever a piece thereof and move back into its original position. This, however, is merely a matter of choice. The controls for said piston-and-cylinder element will be hereinafter described with reference to the electrical diagram.

One very important feature of the clipper mechanism, however, is an electrical make-and-break 48. (See Fig. 3.) It is arranged upon one of the guides 34 and is engaged so as to make-and-break an electrical circuit as the blade moves towards the base plate in severing a piece of plywood. Said make-and-break 48 is in the control circuit for the driving means for the feed chains 7 and the feed belts 4. Thus, when the clipper blade comes down to sever a piece of plywood, power is cut off from the feed chains and feed belts and their motion is stopped, so that while the blade is passing through the sheet of plywood, it is not being moved forwardly. This is particularly important when the front edge of a board of ply is to be clipped. If the feed belt and chains continue to push the board or ply forward, it would either crumple the piece of plywood, or would tend to move it out of square from the position in which it was initially arranged by the pins 29, as has heretofore been described. By stopping the forward progress, however, the clipping is done cleanly and the predetermined squared relation is not disturbed. Said electrical make-and-break has an arm 48a which actuates it, and a roller 48b is carried by the free end of said arm. It engages an adjustable block 49 on the head 35, and when said head, and therewith said block, moves down, said arm is permitted to swing outwardly and downwardly, clockwise, to cut off power from the feed chains and belts. If the rearward end of a board or ply is to be cut off, as shown in Fig. 2, no effort is made to stop the board or ply, because it is then engaged by the feed chains at the discharge side of the clipper and only a small piece is severed, and said piece is refuse and no care must be taken to see that it is not damaged. It is desirable, also, that said piece of refuse be spaced somewhat from the trailing edge of the reclaimed clipped piece of ply or board, and the continued movement thereof and the stoppage of said trimmed section separate said parts so that trimmer saws, hereinafter described, may cut up said piece of refuse without running the chance of "nicking" the board or ply reclaimed.

Referring next to Fig. 4:

The board or ply being trimmed has passed the line of the clipper blade and is engaged between overriding feed chains 50 and underlying feed belts 28. The feed belts are driven by the chain 26, as has heretofore been described, and the feed chains 50 are powered by an obliquely disposed chain 52, shown in Fig. 3, which leads to a transverse shaft 53, upon which all of the feed sprockets 54 for the feed chains are fixed. (See Fig. 1). The parts of the feed chains lying adjacent the clipper pass around idling sprockets

55. The sprockets 54 and 55 are held at proper spacing by a reach bar 56 for each of said feed chains. The transverse shaft 53 is journaled in the free ends of arms 53a.

A series of saws 57 are spaced across the frame, preferably at one foot intervals, as is shown in Fig. 1. They are carried by swinging brackets 58, respectively, pivotally mounted upon a shaft 59, having bearings 59a for said swinging brackets. Said brackets are moved upwardly and downwardly by double acting piston-and-cylinder elements 60, actuated by controls which will hereinafter be described in connection with the electrical diagram for said controls. Said saws normally are arranged above the plane of the boards or plies, and may selectively be actuated to move into operating position. The saws preferably are constantly running, being driven by a motor 61, acting through belt 61a to a common shaft 62. For each saw is a pulley 63, keyed to said shaft 62. An endless belt 64 engages said pulley and a saw pulley 57a on the mandrel 57b for each saw. Said saws rotate at high speed, and thus when they are moved into operating position, illustrated in Fig. 4, they will cut transversely the board or ply engaged by the feed chains and belts 50-28 at such time.

The machine illustrated is adapted to take a piece of plywood or a board 12 feet long. There would thus be 11 saws if they are arranged at one-foot intervals, capable of sawing each board or piece of plywood into lengths one foot long, if all of said saws were depressed. It is possible, therefore, to cut a board or sheet of plywood in any selected length at one-foot intervals. It is to be remembered that plywood is cut $\frac{1}{4}$ inch long to the foot, and thus the dimensions given are only approximate. That is to say, a 12 foot piece of plywood actually is cut 148 inches long, and each of the so-called one foot intervals indicated are actually $12\frac{1}{4}$ inches spacing from center to center. Within these limits, therefore, said spacings are maintained. Under said trimmer saws is arranged a pit 65, and it is into this pit that the portions of the boards or plies, which are to be disposed of, are discharged. That is to say, refuse is discharged from a machine embodying my invention at this point, and it is permitted to fall into a trough 66, having sloping sides and a trash belt 67 forming the bottom thereof. The parts to be discharged in this manner preferably are cut into short lengths so they will pass readily into the pit between the feed belts and will slide down the sloping floor of the trough and be carried away by the trash belt. A weighted roller 68 is arranged laterally intermediate each of the belts 28 and feed chains 50, and normally is permitted to move under gravity to a plane below that at which it lies in Fig. 4. This tends to push the trash below the belts 28 so that it will be disposed of on the trash belt 67 in the trough 66, as has been described. Said weighted roller performs another function; namely, it causes the boards 6, which span the said feed belts 28 and are to be retrieved, to move without slipping thereon until the trailing edge of each board passes beyond the point of engagement with said weighted rollers. Said weighted rollers are carried by the free end of arms 69, and said arms are joined by a structural member 70, which is supported by a coil spring 71 to a fixed part of the frame or machine. This may be adjusted so that a correct amount of weight will be imposed by said roller 68 upon the sheets

or plies to perform the functions previously described.

Boards or plies, which are discharged from the trimmer saws and are to be retrieved or recovered, are moved along by the belts 28. Said belts are supported by narrow timbers 72, extending longitudinally of the machine. Said timbers are slightly narrower than the belts 28 and thus interpose no obstruction to the discharge of trash from said machine. They support the upper span of the belt, however, and cause the course for said boards or plies to extend in a more or less continuous plane. At the left-hand side of Fig. 5, which is at the offbearing side from the saws, a series of pins 73 may be moved upwardly to intercept the forward edge of a board or ply before it passes along on said belts to laterally discharging rollers 74. As is shown in Fig. 1, said rollers rotate upon axes which extend longitudinally of the machine, and thus the boards or plies which are to be retrieved are caused to change direction at a 90 degree angle on said machine and be discharged at the upper right-rear edge of the machine, as viewed in said Fig. 1. The plane of the upper portion of the belts 28 lies above the periphery of said rollers when they are depressed, as is shown in Fig. 5. The rollers 74 may be lifted to a point where the upper portions thereof lie above the plane of the belts, and then they will engage the under surface of the boards or plies and cause them to be shifted transversely of the machine.

Each roller 74 is journaled in a pair of journal bearings 75, supported by a frame 76, which underlies the rollers. Said frame 76 is a subframe, as far as it relates to the general frame of the machine, and is movable therein. A pair of bell cranks 77-78 are pivotally mounted upon through shafts 79-80, extending the width of the machine. Bearings 81 and 82, respectively, support said cranks through shafts 79 and 80, said bearings being supported by upright portions of the main frame of the machine. The shaft 80 is rotated or oscillated by a piston-and-cylinder element 83, as is shown in Fig. 5, the piston rod 83a thereof, being joined by a shackle 84 to bell crank 78. Said bell crank is fixed to said shaft 80, and thus when said shaft rotates, it causes similar operating devices for each of the rolls to be actuated simultaneously with the one to which said shackle is directly secured. In each of said mechanisms for lifting said rollers, a connecting rod 85 joins the bell cranks 77 and 78 therein to cause them to rotate simultaneously. The bell crank 77 moves clockwise about the axis of the through shaft 79 when it lifts the subframe 76, and thus the roller which is supported thereby. The bell crank 78 rotates counter-clockwise in performing the same function. A depending leg 76a on said frame 76 is pivotally joined to the bell crank 77, and the bell crank 78 is operatively joined to the other end of said frame by a link 86, pivotally joined at its lower end to said bell crank 78. At its upper end, it is pivotally joined to the frame 76. Said rollers are rotated by a single, continuous chain 87, which engages a sprocket 88 on each of the rollers 74. This is shown most clearly in Fig. 6. Said chain follows a sinuous course and is engaged intermediate the sprockets 88 by idler sprockets 89. Said idler sprockets cause the chain to engage a greater portion of the periphery of the sprockets 88, and also may be used as tighteners to promote close working engagement between

said chain 87 and the sprockets 88 on the rollers 74.

Abutting said frame 76, adjacent the leg 76a thereof, is a pivoted lever 90, carrying an adjustable tappet bolt 90a at the free end thereof. That is to say, when the frame 76 is lowered, it bears against the head of said tappet bolt 90a and rocks the lever 90 clockwise. When the weight of said bracket and the supporting mechanism is lifted, a coil spring 91 rocks said lever counter-clockwise. Said lever is joined to an operating lever 92 lying above it by means of a pivoted link 93. The pivot axes of said levers 90 and 92, respectively, are arranged so that a small pivotal movement of the lever 90 will be translated into a greater arcuate movement of the operating lever 92. That is, said lever 90 is pivotally mounted adjacent its middle, while the operating lever 92 is mounted so that the link 93 is closer to said pivot axis thereof than is the free end thereof. At said free end 92a of each lever 92 is a pin 73, which may be lowered to the position shown to permit boards or sections of plywood to pass thereover, or may be lifted to the position shown in dotted outline in Fig. 5, to intercept sections of plywood or boards by engaging the forward edges thereof. Each pin is supported by a coil-encircling spring 73a, which engages a shoulder 73b on said pin by one end and the free end of the operating lever 92 by the other end. Said pin 73 passes through a bearing block 95, which guides the movement of said pin. The upper surface thereof is curved so as to prevent a sagging board or ply from engaging said bearing block and becoming "hung-up" when the pin 94 is depressed. It is thus apparent that when the rollers 74 are lifted so as to engage the boards or plies, simultaneously therewith or slightly in advance of said movement the series of pins 73 are lifted to prevent any further boards or plies from being moved along by the belts 28 into overlying position with respect to the rollers 74. Likewise, when said rollers are lowered, said pins are retracted to permit boards or plies to move into overlying position, as is shown in Fig. 5. The first of said boards or plies is permitted, when said pins are retracted, to move into abutment with a pendent rail 96 at the discharge end of said belts. Thus by predetermining the timing of lifting and lowering of said rollers, boards or plies are permitted to move over the full length of the rollers before the latter are lifted, and thus all boards or plies in overlying position are simultaneously shifted laterally of the machine in such arrangement that they may be stacked in layers upon a transfer truck (not shown) corresponding in width, more or less, to the length of said rollers. The timing mechanism for operating the piston-and-cylinder element 83 will be hereinafter described in connection with the timer and the electrical diagram. An overlying idler roller 74a (Fig. 6) is arranged at the discharge side of the bank of rollers 74 and engages the upper surface of plies or boards moved by said rollers into discharging position from said machine. Said overlying idler roller is in stacked alinement with the last roller at the discharge side of said machine, and holds, with said roller, the sheets or boards as they are moved from said machine and causes them to lie flatwise in a selected layer thus built up. Said overlying idler roller is carried by squared blocks 74b, in a vertical framework 74c, having an elongated slot 74d therein. The mass of said idler roller 74a tends to cause the blocks 74b

at the ends thereof to lie at the lower end of said slots 14d.

It is my purpose to control the movement of all of the various parts of this machine by distant controls and preferably by electrical means. In Fig. 7, I have shown an electrical diagram, in which all of said parts are indicated either symbolically or by legends. As is shown in Fig. 1, push-button control is provided, and said controls are arranged in banks upon a keyboard 97. Said keyboard is shown laterally displaced with respect to the frame of the machine. In actual practice, said keyboard is arranged upon a stand, arranged at one side of and in an elevated position with respect to said machine. Thus the operator may look down upon the entire machine and view the operation of the several boards or plies passing therethrough. Said keyboard is arranged more or less in alinement with one edge of the intake side of the machine, because it is at this point that a better view of the plies or boards being operated upon must be maintained. That is to say, it is necessary that the operator view quite carefully the condition of the boards to be retrieved, the alinement of said boards with respect to the positioning means at the intake side of said machine, and the surface of said boards, with the end in mind that useful portions will be clipped and sawed therefrom.

In said diagram, I have indicated that electrical energy shall be supplied at different voltages. This is cited by way of illustration and is not critical. I have found that 440-volt lines can be supplied to the clutch solenoid 18, because it is required to perform heavy work. One hundred and ten volt lines may be supplied for the other controls, because, in the main, they are only small solenoids which move relays and perform other similar light work. The saws have been numbered 1 to 11, inclusively, as in a typical operation, where the maximum length of plies to be accommodated is 12 feet long plus the additional wastage which is common practice, and has been commented upon heretofore. Similar symbols have been adopted for other operations, and said symbols are indicated in the diagram and preferably are placed upon the keys or push-buttons in the keyboard. The limited area of the keyboard, as is shown in Fig. 1, prevents them from being illustrated, and thus they have been eliminated from said figure.

For example, the legends and the initials on said electrical diagram have the following meaning: "Clutch sol." means the solenoid control which operates the clutch 17 for making operative and inoperative the feed chains 7 and feed belts 4 running to the forward end of the machine. That is, said clutch is used to engage and disengage power supplied to the belts 4 and chains 7, which feed sections of plywood to the clipper 33. "Clipper sol." indicates the clipper solenoid 47a, which operates a valve 47b controlling the flow of fluid to the piston-and-cylinder element 47 for the clipper 33. The switch marked "Toggle sw." is a manual switch in the electrical circuit running to the entire keyboard which, when opened, will make the keyboard and the controls carried thereby ineffective, because they will no longer be supplied with electrical energy. The switch marked "Clipper limit sw." is the electrical make-and-break 48 carried by the upper end of the guiding members 34, and which is opened when the clipper head 35 is lowered toward operative position and is closed when

the clipper head 35 assumes the position shown in Fig. 3. The legend "Pins sol." means that this symbol covers the solenoid 30, which controls the position of the pins 29, which square the board initially with the clipper. The legend "R-foot" is a control button not in the bank on the keyboard, but which is operated by the right foot of the operator and opens and closes the circuit to said solenoid 30. The legend "L-foot" indicates a switch which is also off the keyboard and is operated by the left foot of the operator. This is shown in parallelism with a button marked "All." Either of these buttons, when actuated, causes all of the saws to be lowered into cutting position, as when a section is to be cut into short lengths and directed into the trough 66 and to be carried away by the trash belt 67. The legend "SC" indicates a key in the keyboard which, when depressed, will stop all chains. That is, the depression of said key will stop not only the feed chains 7 and belts 4 which move the board or ply into the clipper, but will stop all feed and transfer chains, belts and rollers throughout the entire machine, and is thus more or less of a safety key. The next key to the right is marked "SP." This cuts the power from the feed belts 4 and feed chains 7 alone, but permits the off-bearing chains to continue to operate. That is, when said key is depressed, it actuates the solenoid 13, which throws out the clutch 17 from the power supply for said feed chains. The next switch key or button to the right is lettered "CS." The depression of this key causes the clipper to strike a blow and stop, and also causes the feed chains to be stopped. The next button is marked "C" and is merely a switch for applying power to the piston-and-cylinder element by closing solenoid 47a to valve 47b, which operates the clipper 33. The remaining keys and the legends applied thereto relate to the numbers of the saws 57 which are to be actuated. For example, number 1 indicates the upper saw, as viewed in Fig. 1, and number 11 indicates the lower saw, as indicated in said figure. The intermediate saws are numbered with intermediate consecutive numbers. It is to be noted that some keys are marked 1 to 4, 5 to 8, 8 to 11, and these keys are connected in series so that the depression of said push-buttons will cause saws bearing the same numbers to be depressed, that is, moved into operative position with relation to a board or section of plywood passing beneath said saws, respectively. Similar numbers are given to the relays which control said saws in banks, and to the individual relays for the saws individually, for ease in tracing the electrical diagram from the control buttons to the saws to be actuated.

The key marked "T" is a trip or clearing mechanism which actuates the solenoid marked "Key Release". It is to be understood that the keys or buttons in the keyboard are spring-raised and are latched in lowered position by a latch in the same manner as the keys in an adding machine. The pushing of the button marked "T" causes the solenoid marked "Key release" to be actuated, which pulls out all of the trips for said buttons and causes them all to be returned to inoperative position.

In the diagram, it is to be understood that all switches are spring actuated except the switch marked "Toggle sw.", the switch 92 at the lower left-hand side which controls the supply of current to the timer 100, and the individual switches for the saws marked 1 to 11, inclusive. In said diagram, also, certain switch fingers are joined

by broken lines to indicate that they are mechanically tied together but are electrically separated. With the foregoing explanation, and by the use of conventional symbols, it is believed that anyone skilled in the art will be able to understand the operation of said machine without tracing each circuit and the actuation of each control.

It seems necessary, however, to describe that portion thereof which constitutes a timer mechanism 100 for lifting and lowering the rollers 74 and therewith the pins 94. This is illustrated at the lower left-hand side of said diagram. Reference is had, also, to Fig. 1. On the upper side of the frame in Fig. 1 and keyed to the shaft 53 is a disk 101, which is joined by some reduction means (not shown) to a small pinion 102, which drives a timer gear 103 at substantially lower speed. Said timer gear has pins 104 and 105 extending laterally from the face thereof. Pins 104 actuate the switch of a make-and-break 106, and pins 105 perform a similar function with switches of a make-and-break 107. Thus at predetermined points with relation to the movement of the feed belts 28, said make-and-breaks 106 and 107 are actuated and they close the circuit to a solenoid 108, operating the valve for a piston-and-cylinder element 83. This is done through a relay 109, which, when energized, closes switch points 110, 111. As has been pointed out, said switch points are normally held open by a spring and are closed only when the electromagnetic relay is closed. The make-and-breaks 106 and 107 are pivotally mounted and are rocked when they are engaged by the pins 104 and 105, respectively, on the timer gear. Thus, when the pin 104 rocks the make-and-break 106, it causes current to flow from the supply through said make-and-break 106, through connection 112, switch point 110, connection 113, to the make-and-break 107. Said make-and-break 107 is normally spring-closed and remains closed until it is engaged by one of the pins 105 to open said circuit through the connection 113. Thus, to actuate the solenoid 108, it is necessary, first, for the make-and-break 106 to be closed to actuate the relay 109 and to close the circuit to the make-and-break 107 and to the solenoid 108. Thus the current flows through two different circuits to the relay 109 and actuates the solenoid 108 as long as either of said make-and-breaks 106—107 are closed. When a pin 105 opens the make-and-break 107, then it overcomes the spring tension in said switch and opens the circuit through line 113. The circuit through the connection 112 will already have been opened, because said make-and-break 106 is spring opened. Thus the time that the solenoid is maintained actuated is the time between which the make-and-break 106 is closed and the make-and-break 107 is opened. The timing may be varied selectively by moving the pins 104—105 about the circumference of the timer gear 103. There are a plurality of holes spaced at more or less uniform intervals around said gear, and the number of times per revolution that a circuit is made through said make-and-breaks 106 and 107 is controlled by the number of pins 104 and 105, respectively, that are placed in said gear and extend laterally therefrom, and, also, their relation one with the other.

I claim:

1. In a machine for retrieving selected intermediate sections from an elongated sheet of material, material conveying means for advancing a sheet along a path extending longitudinally of said machine, said conveying means comprising

a pair of opposed material engaging members adapted frictionally to engage the opposite faces of said sheet but to slide over said faces when the sheet is stopped, movable material cutting means mounted transversely of said path adjacent the terminal end thereof, and a series of laterally aligned interrupting pins carried by said machine in advance of said cutting means, said interrupting pins including means selectively movable to a position intersecting said path at a point intermediate the beginning of said path and the location of said cutting means to stop and laterally to align a sheet passing along said path, said interrupting pins being retractable to a position clear of said path.

2. In a machine for cutting selected intermediate sections from a sheet of material, material conveying means for passing a sheet along a path extending longitudinally of said machine, a clutch means operable selectively to stop said conveying means, said conveying means comprising a pair of opposed material engaging members adapted frictionally to engage the opposite faces of said sheet, a reciprocable cutting means mounted adjacent the terminal end of said path and movable to and from a position intersecting the path, means bearing on said cutting means and joined operatively to said clutch means to stop said conveyor in response to a movement of the cutting means toward intersection of said path, and interrupting members mounted in advance of said cutting means along said path, said interrupting members including means selectively positionable to intersect said path and to stop a sheet passing along said path and to align said sheet, said interrupting member means being resiliently mounted to yield if a sheet overlies them when they are selectively actuated to be positioned to intersect said path.

3. In a machine for retrieving selected intermediate sections from a sheet of veneer, material conveying means for passing a sheet of veneer along a path extending longitudinally of said machine, said conveying means having a feed and a discharge end and comprising a pair of opposed material engaging members adapted frictionally to engage the opposite faces of said sheet of veneer, cutting means arranged transversely of said path adjacent the discharge end of said conveying means, and a laterally aligned series of interrupting pin means mounted intermediate said cutting means and the feed end of said conveying means, said series of pin means being movable in unison by a rock shaft from a retracted position below said path to an extended position intersecting said path in advance of said cutting means, a separate spring means interposed intermediate said rock shaft and each pin to yield and prevent movement of a pin if a sheet of veneer overlies that pin when movement to said extended position is attempted.

4. In a machine for cutting selected intermediate sections from a sheet of veneer, material conveying means for passing a sheet of veneer along a path extending longitudinally of said machine, a clutch means selectively for operating or stopping said conveying means, said conveying means comprising a pair of opposed material engaging members adapted frictionally to engage the opposite faces of said sheet but to slide over said faces when the sheet of veneer is stopped, a reciprocable clipper blade cutting means movable to and from a position intersecting said path to clip a sheet of veneer passing therealong, control means operatively connected with said clutch

means and responsive to a reciprocable movement of said clipper blade to actuate the clutch and stop the conveying means, a series of interrupting pins carried by said machine in advance of said cutting means, said interrupting pins including means selectively positionable to intersect said path and to engage the forward edge of a sheet passing along said path before that sheet reaches said clipper blade, said interrupting pins being movable to said intersecting position from a position clear of said path and out of engagement with a sheet of veneer passing along said path, said pins being resiliently mounted to yield if a sheet of veneer overlies them when they are actuated toward said position intersecting said path, and said pins being arranged in series in parallel alignment with and adjacent said clipper blade but in advance of the blade so a sheet of veneer is aligned prior to passing said blade.

WILLIS E. SMITH. 20

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