Dec. 30, 1952 B. G. PRICE ET AL 2,623,589

VENEER CLIPPER

Filed Sept. 5, 1950 4 Sheets-Sheet 1

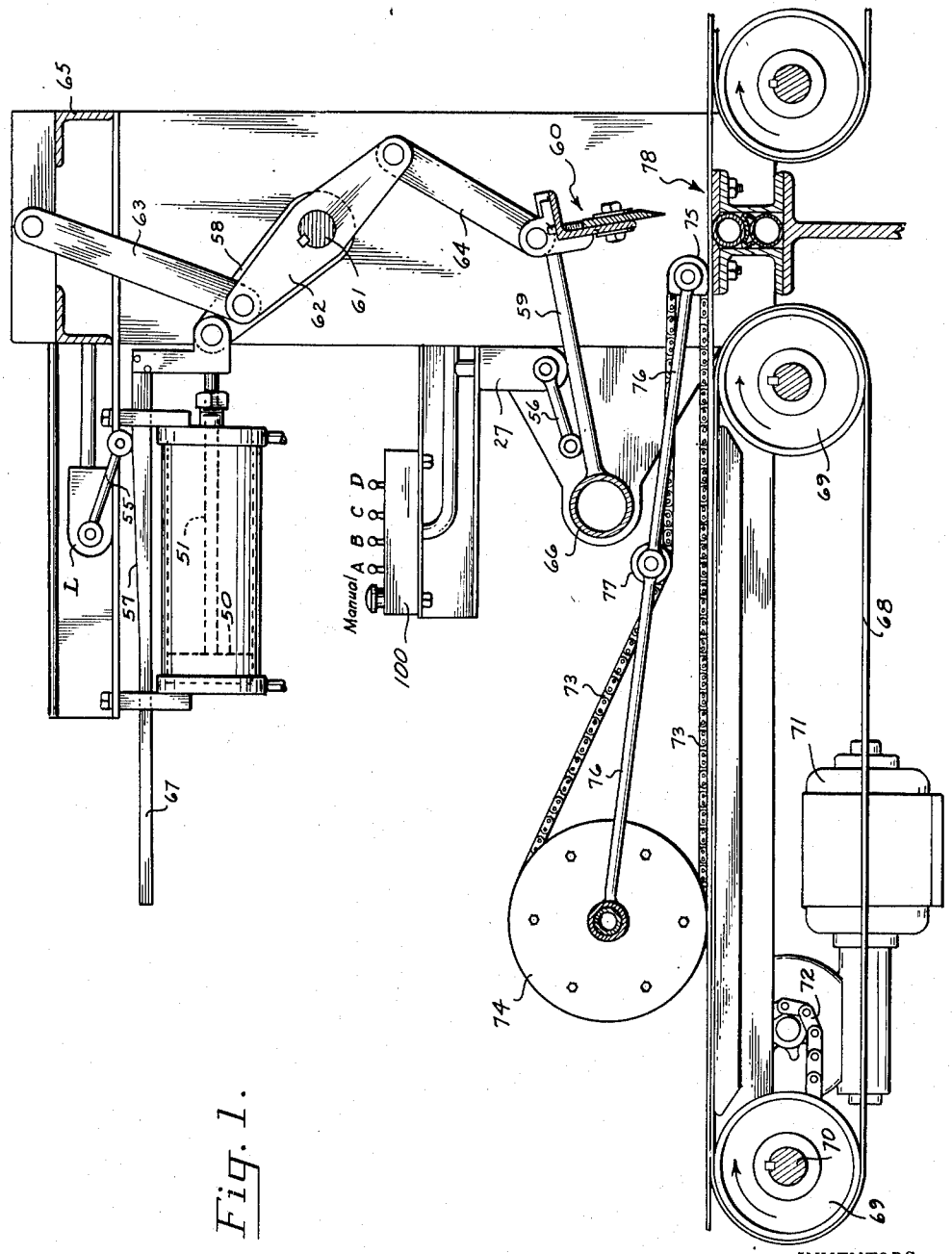


Fig. 1.

INVENTORS
Kenneth C. Desler
and Burton G. Price
BY
Atty.

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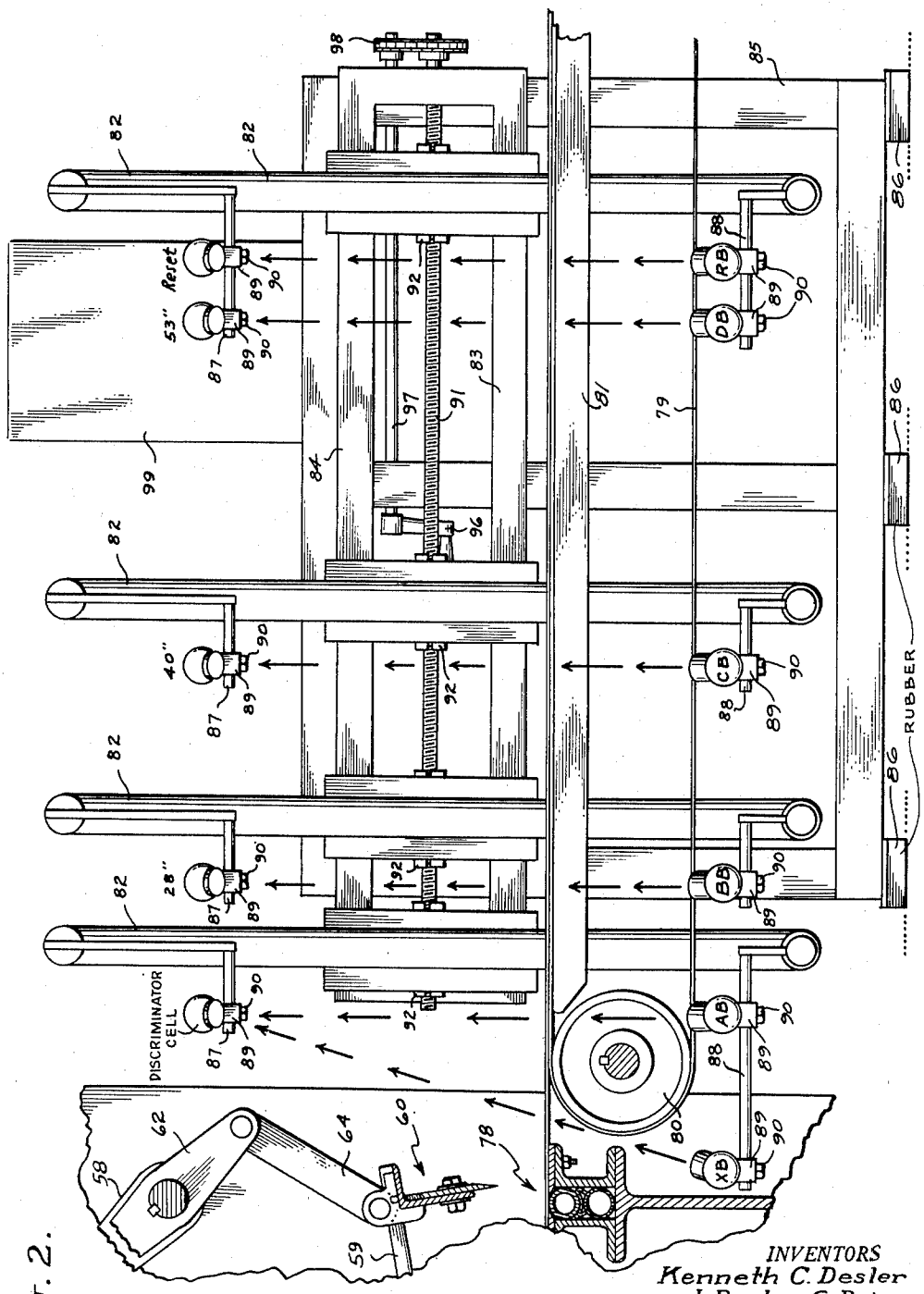


Fig. 2.

INVENTORS
Kenneth C. Desler
and Burton G. Price
BY
Atty.

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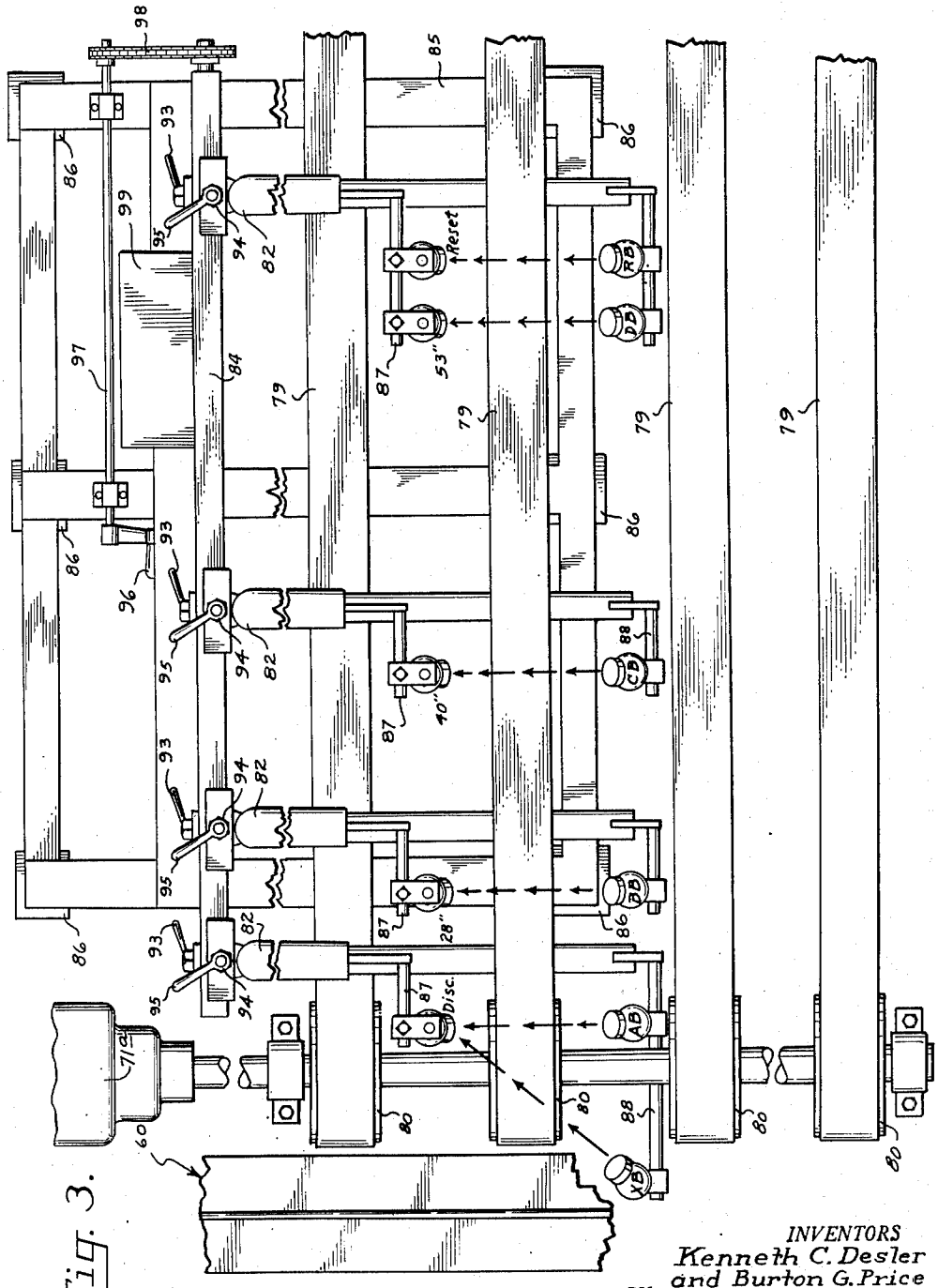


Fig. 3.

INVENTORS
Kenneth C. Desler
and Burton G. Price
BY
Atty.

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VENEER CLIPPER

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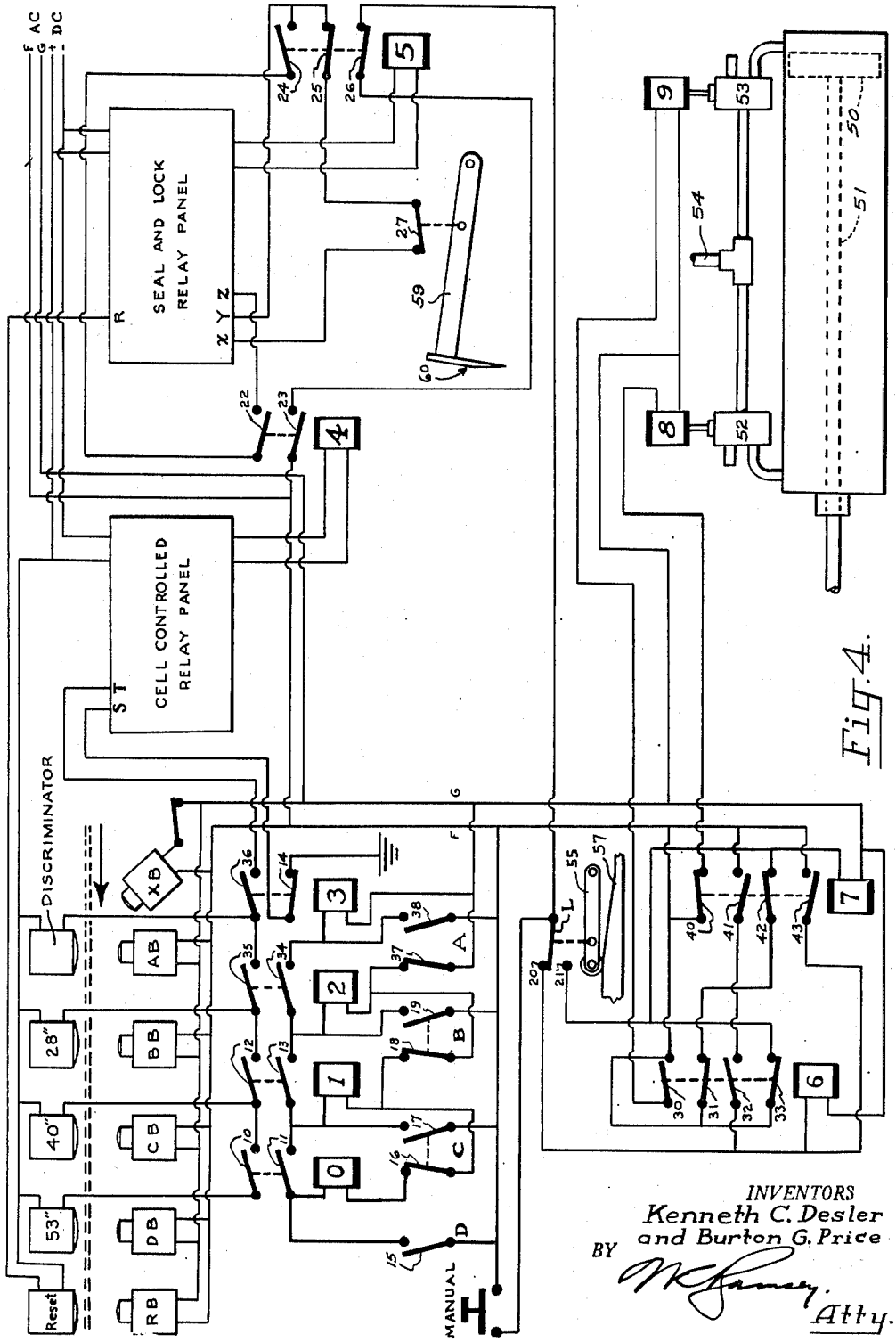


Fig. 4.

INVENTORS
Kenneth C. Desler
and Burton G. Price
BY
Atty.

Patented Dec. 30, 1952

2,623,589

UNITED STATES PATENT OFFICE

2,623,589

VENEER CLIPPER

Burton G. Price and Kenneth C. Desler, Vancouver, Wash., assignors to Vancouver Plywood Co., Vancouver, Wash., a corporation of Washington

Application September 5, 1950, Serial No. 183,132

12 Claims. (Cl. 164—49)

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This invention relates to a veneer clipper such as is employed by the plywood industry to clip or cut a continuous sheet of veneer or parts thereof into pieces of preselected size.

One object of our invention is to provide a veneer clipper wherein actuation of the blade assembly is controlled, automatically, to make a cut each time the leading edge of the continuous sheet travels a preselected distance beyond the blade assembly, yet, wherein an optional manual control can take over at any time to cut a flaw from the sheet.

In the Pacific Northwest, which leads all other regions in logging operations and in timber resources, the production of plywood is a major industry. The typical plywood board is fabricated from a number of thin layers of veneer which are glued together so the grain of each layer is at right angles to that of its neighbor. Each individual ply or veneer is the end product resulting from a long and complex process of formation. At the plywood mill, this process begins when a log is snaked from the pond, trimmed to length, and the bark removed. Thereafter, the log is fed to a huge, steam-driven, veneer lathe where a continuous strip of veneer, usually ⅛ inch thick, is peeled from the revolving periphery. This sheet is cut to lengths commensurate with temporary storage facilities (for example, 1,000 ft. lengths) and is fed, on belts, to horizontal storage racks. These storage racks terminate adjacent the feed belt of the veneer clipper where the elongate continuous sheets are cut to smaller sizes correlated to the dimensions desired in the finished plywood board (for example, 53, 40, or 28-inch lengths). At the off-bearing side of the clipper, the pieces of veneer are stacked selectively, according to predetermined lengths, and are transported to a kiln for drying. The cured pieces are then ready for the final trim and for assembly into plywood boards. It is the veneer clipper per se, however, with which our invention is concerned.

The typical veneer clipper consists of correlated feed and off-bearing belts, respectively, which feed the continuous sheet to and convey the cut pieces from a clipper blade assembly. The clipper blade describes a rapid operating cycle consisting of a down stroke cut into the continuous sheet and a return stroke. Generally, actuation is provided by means of a solenoid controlled air cylinder which operates through a toggle or eccentric mechanism. The clipper operator, in days gone past, sat on the

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off-bearing side of the clipper assembly, with the control panel before him and made the size cuts desired with reference to ruled lines marked along the clipper frame. Some veneer clippers placed the operator on the feed side where size cuts were made with reference to regularly spaced and pivotally mounted dogs or fingers which were carried by the outboard feed chain. Selected ones of these dogs were pivoted into indicating position upon the outboard feed chain ahead of the clipper blade by a helper. These methods were unsatisfactory, however, since the cuts were only accurate within the limits of human judgment and the pivotal dogs were spaced on one inch centers so that no fractional inch cuts could be indicated. Accordingly, a semi-automatic clipper control was devised wherein a rotary drum was mounted to ride on the surface of the veneer as it was fed to the blade and this drum tripped a mercury switch after a preselected length had passed thereunder. This control, too, was possessed of certain inherent disadvantages since the drum would often slip and would skip over entirely all broken spaces in the sheet. In fact, our experience with the drum-type clipper control has shown there is an inherent inacuracy of at least one inch in each cut made. For this reason, the control must be set at least one inch oversize and such a practice is wasteful of material.

The most recent proposals for an automatic veneer clipper control suggest the use of photoelectric cells and beams located along the path of travel of the continuous sheet. Thus, a cut would be made each time the leading edge of the sheet traveled a preselected distance beyond the blade as measured by an interception of the photoelectric cells. These proposals appear to offer a simple solution, but, in fact, are deceptive. For example, if a 53-inch cut were desired, the operator would activate that photoelectric cell which is 53 inches from the blade and, when the leading edge of the continuous sheet intercepts the light beam, the blade would make a cut. It must be remembered, however, that one of the primary responsibilities of the operator is to cut out all the large flaws or holes in the sheet. This, it is proposed, could be done by providing an optional manual control which the operator could actuate to cut from the continuous sheet those sections having flaws or holes therein. For example, an automatic 53 inch cut might be made automatically when

the leading edge of the continuous sheet interrupted the 53 inch cell. Thereafter, a manual cut might be made to eliminate a flaw or hole by clipping off, from the continuous sheet, a small flaw-containing piece. What would happen, however, and this is where the deception enters the picture, when the leading edge of this small, flaw-containing piece interrupts the 53-inch light beam? Obviously, the photoelectric cell would act on it as if it were the leading edge of the continuous sheet and would cause the clipper to make a false cut. That is, the 53-inch cell would be interrupted by the leading edge of the small, flaw-containing piece, rather than by the leading edge of the continuous sheet, and the cell immediately would actuate the clipper. A cut made under such conditions is termed a "false cut." Such a false cut would produce a piece of veneer far short of the desired length and would be wasteful of material. Accordingly, we have turned our inventive efforts toward the provision of an automatic, photoelectric cell controlled, veneer clipper wherein false cuts are eliminated. Furthermore, we have refined and simplified our clipper control to a point where a minimum of electronic equipment, such as relays and vacuum tubes, is required. Such a control is extremely accurate, yet it can be assembled in a minimum time at a minimum cost for use with a majority of existing blade assemblies.

Another object of our invention is to provide an automatic veneer clipper wherein a preselected group of a plurality of parallel circuit photoelectric cells must be intercepted before the clipper blade is actuated, thus eliminating the false-cut propensities thereof.

A further object of our invention is to provide a correlated anti false-cut and reset means for an automatic veneer clipper wherein the anti-false-cut means renders the clipper control inoperative to make further automatic cuts each time the clipper begins a cutting stroke until the reset means renders the clipper control operative again after all cut pieces have cleared the control zone.

Yet another object of our invention is to provide a make-and-break switch for the circuit controlling an automatic veneer clipper whereby the terminal movements of the clipper blade render the circuit inactive and active, sequentially, so the blade must complete each cutting stroke before any further control signals may be dictated thereto.

Still further, one of the objects of our invention is to correlate the lineal speeds of the feed and off-bearing belts of an automatic veneer clipper so the speed of the latter is substantially greater than the feed speed whereby cut pieces of veneer become spaced adjacent the terminal end of the off-bearing belt.

Another object of our invention is to provide a variable size control zone adjacent the off-bearing belt of an automatic veneer clipper wherein the control zone is preconditioned by a locking relay to render the control zone active and inactive, selectively, as dictated by a reset photoelectric cell and beam projecting across the terminal end of the control zone.

These and other objects and advantages of our invention will be described with reference to the accompanying drawings, wherein:

Fig. 1 is a side view, partially in section, showing the feed belt side of our veneer clipper together with the clipper blade assembly and automatic controls adjacent the operator's station;

Fig. 2 is a side view, partially in section, similar to Fig. 1 but showing the off-bearing side of our veneer clipper together with the control zone defined by the photoelectric cells and beams;

Fig. 3 is a plan view of the mechanism shown in Fig. 2 and indicates more clearly the relationship of the photoelectric cells and beams to the off-bearing belt and the mechanism by which the location of the photoelectric cells can be varied at will; and

Fig. 4 is a schematic diagram with various parts of the veneer clipper shown as symbols to better disclose the operation thereof.

Referring to the drawings by reference characters, we have shown our invention in conjunction with a conventional veneer clipper blade assembly generally indicated at 60. Such an assembly is keyed to a free float rod 61 (as at 37 in Fig. 2 of United States Patent 2,394,324—see column 1, page 2, line 25 therein) which carries a plurality of eccentric or toggle mechanisms 62 and the reciprocable blade mechanism. These toggle mechanisms 62 pivotally carry arms 63 and 64 which, in turn, pivotally link with the main frame 65 and the blade assembly 60, respectively. The free float rod 61 is caused to rotate and reciprocate, vertically, by means of an air motor having a piston 50 and a connecting rod 51 joined thereto by means of a toggle link 58. An accurate cutting alignment is maintained for the blade assembly 60 by means of a radius guide bar 59 journaled on a shaft 66 and carrying the control arm 56 for actuating a switch 27. As best seen in Fig. 4, air is supplied to and exhausted from the respective sides of the piston 50 by means of two solenoid-controlled valves 52 and 53 which mutually are fed from an air supply line 54. Thus, the clipper blade assembly is actuated by the solenoid-controlled air piston 50 to describe a rapid operating cycle consisting of a down stroke flying-cut into the continuous veneer sheet and a return stroke each time the toggle mechanism travels over center. The continuous veneer sheet is cut as the piston 50 passes the mid-point of travel during each stroke.

Referring again to the toggle link 58 and the connecting rod 51 of Fig. 1, it will be seen that the junction point of these two elements carries an L-shaped member 67 which travels to and fro with the movements of the toggle mechanism and air piston. A sloping cam 57 is cut into the top face of this member 67 for cooperation with the follower arm 55. As will be hereinafter described, the follower arm 55 is also a control arm for actuating a make-and-break switch L.

The means by which the continuous sheet of veneer is fed to the reciprocating clipper blade assembly 60 best takes the form of a feed belt 68 turning on pulley wheels 69. The left hand or drive pulley wheel 69 is keyed to a shaft 70 which, in turn, is driven by an electric motor 71 geared thereto by means of a chain and sprocket mechanism 72. While we have shown no particular mechanism for varying the speed of the electric motor 71, it is to be understood that such a mechanism may be provided, if desired, in order that the lineal velocity of the feed belt can be variable within certain limits. Bearing on the top of the feed belt 68 and

riding therewith we have shown a riding chain 73 and two idler sprockets 74 and 75. The riding chain 73 is tensioned by means of a dual arm 76 and wheel 77. Thus, as the continuous sheet of veneer is fed to the clipper blade assembly 60, it is pressed flat and held in tight contact with the feed belts 68. At the terminal end of the riding chain 73 and adjacent the blade assembly 60, we have shown the conventional hollow shaft pneumatic-bearing assembly 78. This assembly 78 coacts with the clipper blade and the riding chain to insure an accurate, clean, cut each time the blade assembly describes a cycle.

Referring now to Figs. 2 and 3, we have therein shown the off-bearing side of our veneer clipper. Thus, four identical off-bearing belts 79 are shown riding on pulley wheels 80 with the under surface of the upper belt portions bearing on discontinuous table members. These off-bearing belts, together with feed belts, define a path of travel for feeding the continuous sheet to and conveying the cut pieces from the clipper blade assembly. Motive power to actuate the off-bearing belts 79 may be derived from any conventional mechanism, as for example, from an electric motor 71*a* similar to the electric motor 71. Suffice to say, the means to drive the off-bearing belt should also have a variable speed regulator in order that the lineal speeds of the feed and off-bearing belts may be correlated to the requirements of the clipper. For example, experience has taught that the lineal speed of the off-bearing belt 79 must exceed that of the feed belt 68 by a substantial amount in order to space the cut pieces of veneer as they leave the clipper blade assembly 60. For reasons to be later described, the ratio of the speed of the feed belt to the off-bearing belt should be in the neighborhood of 1 to 5, or greater.

The control zone, a blanketed interception of which automatically actuates our veneer clipper, is defined by a plurality of mated photoelectric cells and light sources which project beams across the path of the off-bearing belt 79 as shown in Figs. 2 and 3. Reading from the clipper blade assembly along the off-bearing belt, the light sources are identified as XB, AB, BB, CB, DB, and RB. These sources are located beneath the plane of the off-bearing belts 79 and they project a plurality of light beams to a mated plurality of photoelectric cells located above the plane of the feed belt. Respectively, the photoelectric cells are identified as a discriminator cell, 28-inch cell, 40-inch cell, 53-inch cell, and reset cell. Thus, the discriminator cell (disc.) is fed by two separate beams originating with the XB and AB light sources. The particular dimensions which we employ to identify the photoelectric cells are meant to be examples only and are variable at the will of the operator in a manner to be hereinafter described. Suffice to say, 28-inch, 40-inch, and 53-inch lengths of veneer are quite common in the Douglas fir plywood industry of the Pacific Northwest. Such dimensions, however, need not restrict the scope of our inventive concept.

The photoelectric cells and light sources are mounted for lateral movement on U-shaped arms 82 slidably carried on double tracks 83 and 84. These tracks, in turn, are secured to a braced frame 85 which rests on rubber pads 86 independent of the remainder of the veneer clipper assembly. Thus, the rubber pads isolate the cell and light source frame so vibration cannot be transmitted from the clipper blade assembly and belts to the light sources and photoelectric cells. Each of the arms 82 has, pendent therefrom, an L-shaped bracket and rod 87 carrying one or more of the photoelectric cells and a similar bracket and rod 88 carrying one or more of the light sources. Each photoelectric cell and light source, in turn, is adjusted laterally along its mated bracket and rod by means of a pierced guide 89 and is secured thereto by means of a nut 90. Such a lateral adjustment is, however, only made to align the photoelectric cell and its light source. A major lateral adjustment of both the photoelectric cell and the light source is then made by means of the elongate threaded rod 91 in a manner now to be described.

Each of the arms 82 carries an elastic locking nut 92 selectively engageable with the threaded rod 91 by means of an adjusting wrench 93. Furthermore, each arm 82 carries a locking nut 94 adapted to bear upon the upper track 84 when cinched tight by means of the handle 95. The threaded rod 91 is rotated by means of a crank handle 96 operatively joined thereto through a journaled rod 97 and a chain and sprocket mechanism 98. Thus, any one or all of the arms 82 may be adjusted by loosening the corresponding locking nut 94, tightening the corresponding elastic nut 92 with the adjusting wrench 93, and rotating the crank handle 96. This turns the chain and sprocket 98 and the threaded rod 91 to cause those arms 82 engaged therewith by means of the elastic nut 92 to travel laterally along the space between the off-bearing belts 79. For example, if the operator desires to define a 48-inch control zone with the photoelectric cells and light source, he may do so by shifting either the 40-inch photoelectric cell and light source or the 53-inch photoelectric cell and light source. If the former is to be shifted, the elastic locking nuts 92 holding the rest of the arms 82 are loosened and the elastic locking nut 92 holding the 40-inch photoelectric cell and mated light source is tightened to engage the threaded rod 91. Then, after the locking nut 94 holding the 40-inch arm is loosened, the crank handle 96 is rotated and the 40-inch photoelectric cell and light source CB, as a unit, are moved to the right (as seen in Fig. 2) until they assume the 48-inch location. Thereafter, the locking nut 94 is again tightened so as to bear on the upper track 84 and secure the 40-inch arm in place.

The schematic wiring diagram for our veneer clipper is shown in Fig. 4. A majority of the wiring and electrical elements shown in this figure, in practice, are located within the wiring box 99 located atop the cell and light source frame 85. While, for the sake of clarity, no wiring has been shown in Figs. 2 and 3, it is to be understood that the wiring and connections of Fig. 4 are present in Figs. 2 and 3. Thus, each photoelectric cell and each light source is wired to the wiring box 99 and this box, in turn, is electrically joined to a source of current and to the control panel 100 shown in Fig. 1. The control panel switches lettered M, A, B, C, and D correspond to the manual, A, B, C, and D switches shown in Fig. 4. Similarly, the discriminator, 28-inch, 40-inch, 53-inch, and reset photoelectric cells shown in Figs. 2 and 3 correspond to the similar symbolic representations in the upper left-hand corner of Fig. 4. The same holds true with respect to the light sources RB, DB, CB, BB, AB, and XB. The various elements of Fig. 4 will now be described.

Numerals 0 to 9 inclusive have been assigned to solenoids. Each of these solenoids has a movable armature which is spring biased to one extreme position so as to describe a to-and-fro movement when energized and de-energized, respectively. Solenoids 0 to 7 inclusive control one or more switches as indicated in the diagram and solenoids 8 and 9 control the valves 52 and 53, respectively, for actuating the air piston 50. For example, the solenoid 0 controls switches 10 and 11 which are spring biased to the open or break position and which are closed against this spring bias when the solenoid 0 is actuated. Similarly, solenoid 6 controls the four switches 30, 31, 32, and 33. Switches 30 and 32 are normally open whereas switches 31 and 33 are normally closed so that solenoid 6, when energized, closes switches 30 and 32 and opens switches 31 and 32. The switch 27 is controlled by the arm 56 which is spring biased to travel up and down to open and close the switch 27 as the clipper blade assembly 60 reciprocates during the cutting cycle. Similarly, the switch L, bridging either contact 20 or contact 21, is secured to the follower arm 55 which rides on the cam 57 to travel with the movement of the clipper blade toggle mechanism. Thus, switch L completes the circuit across either contact 20 or contact 21 while the clipper blade assembly 60 is at rest, yet, while this mechanism is actually cutting, the switch L is between contacts and both 20 and 21 are open. We employ the term "make-and-break" switch to describe the cam-actuated switch L since the contacts 20 and 21 are alternately made and broken while the clipper arm is at rest or traveling, respectively.

In the upper center portion of Fig. 4, we have shown a box labeled "cell-controlled relay panel." In actual practice, the solenoids 4 together with the switches controlled thereby, the connections S and T, and a standard photoelectric cell and light source are all integral parts of a standard photoelectric relay panel. Such a panel may be purchased on the open market as a unit. For example, the General Electric standard line photoelectric relay numbered CR7505–K2 and bearing catalog numbers 5363268G2 and G3 or the Westinghouse relay number RX1 are of this type. These relay panels conventionally include a photoelectric cell, a light source, one or more transformers, potentiometers, capacitors, resistors, and amplifier tubes. Furthermore, such a relay panel conventionally rectifies its own supply of A. C. current to produce direct current for the amplifier tubes, etc. We have obviated the need for illustrating much of this mechanism, such as the rectifier tubes, by indicating, in our schematic diagram of Fig. 4, a source of direct current for this and the other relay. Since the remainder of the mechanism (with one exception) is conventional, it will be readily understood by one skilled in the art. One important point of departure from the conventional relay panel is to be noted, however. Thus, our schematic diagram of Fig. 4 indicates that the cell-controlled relay panel is served by a circuit containing four photoelectric cells which are arrange in parallel (53-inch, 40-inch, 28-inch, and discriminator). The conventional photoelectric relay serves but one photoelectric cell. However, by connecting our photoelectric cells in parallel, we have eliminated the necessity for supplying a separate relay panel for each photoelectric cell. Furthermore, the parallel arrangement of our cells is of aid in preventing false cuts as will be hereinafter described.

In the upper right-hand corner of Fig. 4, we have shown a box labeled "Seal and lock relay panel." This panel is a conventional high speed photoelectirc relay panel incorporating special features, such as a small aperture mask on the photoelectric cell, which make the relay panel useful in effecting a limit switch action of a special nature. Furthermore, this relay panel includes three connections which may be used as self seal-in or lock-out connections. Such connections, when effected, will seal the relay in the energized position and/or lock out the relay in the de-energized position. Thereafter, the photoelectric relay will operate just once and will hold the relay closed or open until an external switch, in series with the above connections, is opened temporarily. This photoelectric relay panel, also, may be purchased on the open market. Examples of such relay panels include the General Electric relays numbered CR7505–N110G11 to G16 and the Westinghouse relay RR5. In our schematic diagram, the connections for the seal-in and lock-out features have been indicated by the letters X, Y, and Z. Thus, when a circuit is made joining the connections X and Y, the relay is locked out and the solenoid which is controlled thereby (solenoid 5) is locked in the de-energized position. Similarly, when a circuit is made joining the connections Y and Z, the relay is sealed in and the solenoid controlled thereby is sealed in the energized position. Whereas the actual physical construction of the cell-controlled relay and seal-and lock relay panel forms no part of our invention, their use in conjunction with our novel veneer clipper and the manner in which they coact with the remainder of the circuit does fall within the scope of our invention.

The solenoid 4, which is shown energized in Fig. 4, is, symbolically, the solenoid relay which is controlled by the cell-controlled relay panel. Thus, two positions may be defined for the cell-controlled relay panel and the solenoid 4. In the normal or operative position, the cell-controlled panel is energized only when the solenoid 3 is energized to open the switch 14 and remove the ground seal connection therefrom. If this ground connection is broken to allow the cell panel to operate, and if light is shining on one of the photoelectric cells so as to transmit an impulse to the connection T, the solenoid 4 is energized and the switches 22 and 23 are open as shown. The second position for the cell panel is defined only when no impulse is transmitted to the connection T. That is to say, the cell-controlled relay panel will de-energize the solenoid 4 and close the switches 22 and 23 only when all those photoelectric cells which are in circuit therewith are dark. This is for the obvious reason that we have joined our photoelectric cells in parallel with the connection T as previously set forth. An examination of Fig. 2 will reveal that the control zone defined by those photoelectric cells which are in circuit with the cell panel can be darkened only by a continuous piece of veneer. For example, were a 30-inch piece of veneer to be clipped by the blade assembly while the control zone is 40 inches in length, the trailing edge of this 30-inch piece would allow the light source XB to project a beam on the discriminator photoelectric cell before the cut piece has traveled far enough to darken the 40-inch cell. Thus, at least one of the photo-

electric cells is light at all times except when a piece of veneer is in position to effect an automatic cut.

Solenoid number 5 is the relay which is controlled by the seal and lock relay panel. In the normal or de-energized position of this solenoid, the spring bias therefor holds the switch 24 in the open position and the switches 25 and 26 in the closed position. It will be noted that the reset photoelectric cell is in circuit with the seal and lock relay panel via the connection R. Thus, whenever light shows on the reset cell, the impulse is sent to the connection R and the seal and lock relay panel seeks to energize the solenoid 5 to reverse the position of the switches 24, 25, and 26. It is at this point that the lock-out feature of this relay comes into play. As heretofore explained, when the circuit from X to Y via the switches 27 and 25 is completed, the seal and lock relay panel locks the solenoid 5 in the de-energized position until a switch in series therewith is temporarily opened. While the seal and lock relay panel is thus locked in the de-energized position, any impulse which is sent from the reset cell to the panel via the connection R is frustrated and is of no effect. That is to say, while the panel is locked out, the solenoid 5 must remain de-energized. To remove the lock out, the circuit joining X and Y must be temporarily broken. In our veneer clipper control, this temporary break is accomplished by means of the switch 27 which is controlled by the clipper blade assembly 60 as shown symbolically in Fig. 4. Thus, when the clipper arm 59 moves down opening the switch 27, the lock-out circuit is broken and the lock out is removed allowing the solenoid 5 to become energized. If a light beam is then showing on the reset cell, the impulse via connection R which has been, up to this time, frustrated, takes over and the solenoid 5 is energized. This reverses the position of the switches 24, 25, and 26. As the clipper arm 59 and assembly 60 complete a stroke, the switch 27 is again closed. This, however, is of no effect since the lock-out circuit is then broken at switch 25. A typical sequential movement of the solenoid 5 is as follows: (1) Initially, solenoid 5 is de-energized, light is showing on the reset photoelectric cell from the light source RB and the switch 27 is closed since the clipper blade assembly 60 is at rest. (2) The clipper blade assembly 60 begins a cutting cycle whereupon the switch 27 is opened breaking the lock-out circuit. (3) The reset cell sends an impulse to the seal and lock relay panel via the connection R and the solenoid 5 is energized to reverse the position of the switches 24, 25, and 26. (4) The clipper blade assembly 60 completes its cycle of movement and returns to the position shown in Fig. 4 to again close the switch 27. This, however, is of no effect since the lock-out circuit has been broken when the switch 25 moves to the open position.

The seal-in feature of the seal and lock relay panel completes an electronic lock or seal in the energized position of the solenoid 5 whenever the circuit Z, 22, 24, Y is completed. For example, if the light beam feeding the reset cell is intercepted, the connection R no longer sends an impulse to maintain the solenoid 5 in the energized position. Thus, the spring bias of the solenoid 5 would return the same to the position shown in Fig. 4 whenever the reset cell went dark if it were not for the seal-in feature. However, if the seal-in circuit is completed at the moment the reset cell is darkened, the connection R is of no effect and the solenoid 5 will remain energized until a switch in series with the circuit Z, 22, 24, Y is temporarily broken. This temporary break is most commonly effected by the switch 22. It will be remembered that the switch 22 is open whenever the solenoid 4 is energized by the cell-controlled relay panel. This, in turn, takes place, whenever an impulse is sent to the connection T by light shining on one of the photoelectric cells then in circuit with the cell panel. Thus, the seal-in circuit is broken whenever light shines on one of those size cells or the discriminator cell which is then in circuit since, at that time, the cell panel energizes the solenoid 4 to open the switch 22. A typical sequential actuation is as follows: (1) The solenoid 5 is energized, solenoid 4 is de-energized, and an uninterrupted beam is projected to the reset photoelectric cell (i. e. a piece of veneer has just been cut by the automatic mechanism). (2) If, at this moment, a small piece of veneer intercepts the reset beam, the solenoid 5 will remain energized since the circuit Y, 24, 22, Z is completed. (3) As the piece of veneer which has been automatically cut moves laterally away from the clipper blade assembly 60, the light source XB projects a beam on the discriminator cell and the connection T causes the cell-controlled relay panel to energize the solenoid 4. This opens the switch 22 and breaks the seal-in circuit. Thereafter, if the reset beam is intercepted, the solenoid 5 is free to move to the de-energized position.

The operation of our veneer clipper will be explained with reference to three separate types of operation. These are: (1) a manual operation; (2) an automatic 40-inch cut operation; and (3) a false cut prevention operation. In each of these types, an operator is seated adjacent the control panel 100 overlooking the feed belt 68 whereon a continuous sheet of veneer is being fed to the clipper blade assembly. Thus, the operator is in the most advantageous position to detect flaws. The normal position of the respective control elements is as follows: Switches 10 and 11 are normally open and are closed by the solenoid 0; switches 12 and 13 are normally open and are closed by the solenoid 1; switches 34 and 35 are normally open and are closed by the solenoid 2; switch 14 is normally closed and switch 36 is normally open—these positions are reversed by the solenoid 3; switches 15, 17, 19, and 38 are normally open while switches 16, 18, and 37 are normally closed—the position of these switches is reversed by the toggle switch mechanisms A, B, C, and D on the control panel 100; the switch A is seldom used except when the operator desires to cut an extraordinarily small piece of veneer. In such a case, the discriminator light source AB and the discriminator photoelectric cell serve as a small size cutting zone. That is to say, if the operator wishes to clip successive small pieces, he merely throws the switch A on the control panel 100 and the discriminator photoelectric cell will become a cell for small sized cuts.

Returning to the normal operation of elements, the switch L contacts either 20 or 21; the switches 22 and 23 are normally closed but the solenoid 4 is energized a majority of the time to open these switches; switch 24 is normally open and switches 25 and 26 are normally closed but the solenoid 5 will reverse the position of all three when energized; the switch 27 is normally closed but is opened by the clipper blade assembly; switches 30, 31, 32, and 33 are tied together, are shown in their spring biased position with the solenoid 6

de-energized, and are all reversed when the solenoid 6 is energized; similarly, the switches 40, 41, 42, and 43 are shown in the position they assume when the solenoid 7 is energized—this position being reversed when the solenoid 7 is de-energized; the solenoids 8 and 9 each open the respective valves 52 and 53 to the supply position when energized and reverse the valves to the exhaust position when de-energized—they are coupled to the circuit so that one valve supplies while the other exhausts.

Manual operation

The manual operation of our veneer clipper is independent of the automatic control mechanism to allow the operator to cut a flaw from the continuous sheet any time such a flaw may appear. For example, no matter which size the operator has selected for an automatic cut, if a broken space or series of splits or breaks, pitch pockets or knotholes is fed to the clipper blade assembly 60, the operator can cut these out by pushing the manual button twice—once just ahead of the flaws and once just behind the flaws. As the manual button is depressed against its spring bias, a pulse is fed from the feed line F of the A. C. current source across the manual button, across L29, through the solenoid 6 to energize the same and back to the ground line G. When the solenoid 6 is energized, the position of the switches 30, 31, 32, and 33 is reversed and the solenoid 7 is de-energized. This is for the reason that the previous feed of current to the solenoid 7 was from the feed line F across the switch 31 and switch 42, through the solenoid and back to the ground line G. When the solenoid 6 is energized, however, the switch 31 is opened to break this circuit. Such a de-energization of the solenoid 7 reverses the position of the switches 40, 41, 42, and 43. Thus, while the solenoid 8 was previously energized across the switch 40, it is now de-energized and, whereas the solenoid 9 was previously de-energized, it is now energized across the switch 30. The movement of the solenoids 8 and 9 moves the valves 52 and 53, respectively, and supplies air to the right face of the piston 50 and exhausts air from the left face thereof. The movement of the piston 50 causes the toggle mechanism to move over center and the clipper blade assembly describes a rapid cut and return stroke clipping the continuous sheet of veneer. As the clipper blade assembly 60 moves, two switch movements take place. The first of these concerns the switch L which is controlled by the follower arm 55 riding on the cam face 57. So long as the assembly is actually moving, the switch L is between the contacts 20 and 21 so no further pulse can be dictated to the solenoid-controlled valve assembly until the switch L reaches the contact 21. The switch L, then, is a make-and-break switch which is controlled by the movements of the clipper blade assembly to render the circuit active and inactive, sequentially, as the assembly begins and completes a cutting stroke whereby the assembly must complete each cutting stroke before any further control signals may be dictated to the valves. The second switch movement concerns the seal and lock relay panel and the switch 27. As the clipper blade assembly 60 descends to begin a cutting cycle, the switch 27 is opened to break the circuit X, 27, 25, Y which is the lock-out circuit. This allows the solenoid 5 to be energized by the seal and lock relay panel via the connection R and the reset photoelectric cell. Thereafter, an automatic cut cannot be made by the mechanism until the manual cut piece intercepts the reset cell to again de-energize the solenoid 5.

As previously explained, the veneer clipper must complete one stroke before another impulse can be dictated thereto since the switch L travels between the contacts 20 and 21 during each cutting stroke. Thus, it is the make-and-break switch L which determines the minimum size cut which our invention can make. For example, if the manual button is held in the depressed position, the clipper blade assembly 60 will make a series of very rapid cuts, each of which begins as the make-and-break switch L contacts one of the points 20 or 21. The distance which the continuous sheet of veneer travels while the make-and-break switch moves from one of these contacts to the other determines the minimum cut. If the lineal velocity of the feed belt is approximately 120 feet per minute, we have found this minimum cut will produce a small piece of veneer approximately 2 to 4 inches in length.

Automatic 40-inch operation

If the operator wishes to effect a series of automatic 40-inch cuts, he must select a control zone commensurate therewith. This is done by moving the double pole switch C of the control panel 100 to place the 40-inch photoelectric cell, the 28-inch photoelectric cell, and the discriminator cell in circuit with the cell-controlled relay panel. The switch 17 is closed to energize the solenoid 1 and close the switches 12 and 13. The closing of switch 13 energizes the solenoid 2 which closes switches 34 and 35. The closing of switch 34 energizes the solenoid 3 which opens switch 14 and closes switch 36. The opening of the switch 14 will remove the ground seal from the cell-controlled panel and allow the panel to function. Thereafter, the operator need only watch the feeding continuous sheet of veneer to detect any flaws since our automatic mechanism will effect a cut each time the continuous sheet of veneer intercepts and blankets the 40-inch, 28-inch, and discriminator cells. That is to say, the control zone which is defined by the 40-inch photoelectric cell must be blanketed entirely before the mechanism will effect an automatic cut.

When a piece of veneer substantially blankets this control zone, the discriminator, 28-inch, and 40-inch cells are darkened to dictate a pulse or precondition the cell-controlled relay panel via the switch 12, switch 35, switch 36 and connection T. The cell panel then will de-energize the solenoid 4 reversing the positions of the switches 22 and 23. A pulse is then fed from the feed line F of the A. C. source across the switch 23, across the switch 26, to the make-and-break switch L where the sequential operation becomes identical with that followed in a manual operation. That is to say, the solenoid 6 is energized, the solenoid 7 is de-energized, the valve 52 is opened to exhaust and the valve 53 is moved to the supply position causing the clipper blade assembly 60 to make a cutting stroke. As the assembly opens the switch 27, the lock-out circuit is broken and the solenoid 5 is no longer locked in the de-energized position. Accordingly, the reset photoelectric cell sends an impulse to the connection R and the seal and lock relay panel causes the solenoid 5 to be energized reversing the switches 24, 25 ,and 26. No further impulse can then be sent to the make-and-break switch L since the circuit over which this impulse must travel is

broken when the switch 26 opens. Furthermore, as the solenoid 5 moves to the energized position, it is sealed in by the seal-in circuit. This circuit is momentarily made from the connection Z, across the switch 22 and the switch 24, to the connection Y. This temporary seal in of the solenoid 5 is removed as soon as the cut piece of veneer clears the first discriminator beam which is fed from the light source XB. Such clearance allows the connection T to receive an impulse. The impulse causes the cell-controlled relay panel to energize the solenoid 4 and break the seal-in circuit as the switch 22 opens. The cut piece of veneer now picks up speed as it moves across and out of the control zone on the fast off-bearing belt 79. As this cut piece intercepts the reset photoelectric cell, the connection R causes the seal and lock relay panel to de-energize the solenoid 5 and, in effect, "reset" the control mechanism. By this time, the clipper blade assembly 60 has completed its cycle of movement so the switch 27 is made and the solenoid 5 is again locked out in the de-energized position.

False cut prevention operation

As previously set forth, one of the objects of our invention is to incorporate a false cut prevention mechanism or an antifalse cut means in an automatic veneer clipper. This we have done by correlating the action of five separate mechanisms. (1) The speed of the off-bearing belt has been increased in the ratio of approximately 5 to 1 over that of the feed belt to space substantially the cut pieces of veneer as they leave the control zone. (2) The reset photoelectric cell and light source have been placed adjacent the terminal end of the control zone to reset or precondition the circuit in response to a clearing of the control zone by all cut pieces. (3) The photoelectric cells and the discriminator cell have been placed in parallel so that the control zone must be substantially blanketed to effect an automatic actuation of the clipper blade assembly. (4) The make-and-break switch L renders the circuit inactive and active, sequentially, as the clipper blade assembly begins and completes a cutting stroke so the assembly must complete each cutting stroke before any further control signals may be dictated to the circuit. (5) The seal-in and lock-out circuits have been correlated to (*a*) the impulses dictated from the photoelectric cells to the cell-controlled relay panel and the solenoid 4 and (*b*) to the movements of the clipper blade assembly 60, respectively.

Let it be assumed that the operator has selected the 40-inch photoelectric cell and a piece of veneer has blanketed the control zone causing the clipper blade assembly to make a cut. As the clipper blade assembly comes to rest after making the cut, the solenoid 5 is energized and sealed in this energized position because the solenoid 4 is de-energized and no light is falling on the 40-inch, 28-inch and discriminator photoelectric cells. The seal-in circuit prevents a reset of the mechanism if a small piece of veneer passes under the reset photoelectric cell at this moment. The operations to be examined, however, result from the manual operation of the clipper blade assembly 60 by the operator before the automatic cut piece of veneer has had time to move out of the control zone. For example, if a large broken space appears on the feed side of the clipper blade assembly, the operator must make a manual cut to dispose of the broken space. The small piece thus cut should not and will not, with our invention, cause the mechanism to effect a false cut. This false cut is prevented by the coaction of the five preventive mechanisms listed above and, in combination, they are termed an antifalse cut means.

Sequentially, as the original, automatically cut, piece begins to move away from the clipper blade assembly 60, the beam from the light source XB, which is located directly adjacent the blade, shines on the discriminator cell causing the cell-controlled relay panel to energize the solenoid 4 and remove the seal-in circuit. If one or more successive manual cuts are now made, the original automatically cut piece and the successive manual cut pieces will intercept the reset cell as they leave the control zone. Each such interception of the reset photoelectric cell de-energizes the connection R to cause the seal and lock relay panel to de-energize the solenoid 5. Assuming the seal-in circuit has been broken, the first de-energized pulse to the connection R will cause the seal and lock relay panel to reset the solenoid 5 by de-energizing the same. Successive de-energized pulses will either (1) reset the circuit if the solenoid 5 is energized when the pulse occurs or (2) have no effect if the solenoid 5 is already de-energized when the pulse occurs. Similarly, successive make-and-break cycles of the switch 27, caused by the cutting movements of the clipper blade assembly 60, will act as follows: (1) If the solenoid 5 is energized when such a cycle begins, the solenoid 5 remains energized. (2) If the solenoid 5 is de-energized when such a cycle begins, the opening of switch 27 removes the lock-out and the reset eye and connection R will energize the solenoid 5. Therefore, as successive manual cuts are made, the solenoid 5 will reciprocate between the energized and de-energized positions. At any rate and in any event, the final position of the solenoid 5 (that is, the position assumed after the last manual cut has been made) will be the de-energized position as shown in Fig. 4. Furthermore, this de-energized position will be assumed prior to the time the continuous sheet of veneer is in position for another automatic cut. This is so since the off-bearing belt carries the manual cut piece past the reset cell (off-bearing belt speed 600 feet per minute) before the feed belt places the uncut piece in position to blanket the control zone (feed belt speed 120 feet per minute). Accordingly, this cycle of operation determines the speed to which the off-bearing belt must be set. For example, the manual cut piece of veneer must travel from the blade to the reset photoelectric cell before the continuous sheet travels 23 inches since the conventional minimum automatic cut is determined by the 28-inch eye and this eye is placed 23 inches from the blade (there is a 5-inch delay in the mechanism between the interception of a cell and an actual cut by the blade). If the reset eye is 55 inches away from the blade, the ratio of 23 to 55 would appear to be approximately 1:2½. However, to allow for the inertia of the cut piece of veneer as it picks up speed and to allow for a safety factor, experience has taught that this ratio should be 1:5. Accordingly, 120 feet per minute is to 600 feet per minute as 1 is to 5.

As above explained, the final position of the solenoid 5 is the de-energized position. In this position, the clipper mechanism is ready for another automatic cut. Thus, the manual cut pieces have traversed the control zone and have intercepted the reset photoelectric cell without

causing a false cut. The mechanism which serves this function is termed an "antifalse cut means." The correct function of this mechanism is of major importance to the plywood industry since a maximum number of usable pieces of veneer can be produced from the continuous sheet. Furthermore, the false cut prevention has been accomplished with a veneer clipper control which requires a minimum of electronic equipment.

In accord with the objects of our invention, we have provided an automatic veneer clipper wherein a preselected group of a plurality of parallel circuit photoelectric cells must be intercepted before the clipper blade is actuated. This preselected group which may, for example, include the 40-inch photoelectric cell, 28-inch cell, and discriminator cell, is selected by the operator. This is to say, the operator may vary the extent of the control zone at will. Furthermore, we have correlated our antifalse cut and reset mechanism so the antifalse cut mechanism renders the clipper control inoperative to make further automatic cuts each time the clipper begins a cutting stroke yet the reset mechanism renders the clipper control operative only after all cut pieces have cleared the control zone. The reset mechanism includes the reset photoelectric cell and the connection R together with the solenoid 5. The antifalse-cut mechanism includes the reset photoelectric cell and the make-and-break of the switch 27 as correlated to the movements of the clipper blade assembly 60 to lock or seal the solenoid 5. Each of these features of our invention cooperates with each of the other features thereof to eliminate the false cutting of a veneer clipper. Furthermore, our automatic veneer clipper is extremely accurate yet it requires a minimum of electronic equipment and can be adapted for use with the majority of existing blade assemblies in a minimum of time at a minimum cost.

We claim:

1. In an automatic veneer clipper having a clipper blade assembly and a path of travel defined by correlated feed means for feeding a continuous sheet to said clipper blade assembly and off-bearing means for conveying cut pieces therefrom, a spaced plurality of mated photoelectric cells and beams projecting across the off-bearing portion of said path to define a control zone interceptable by veneer traversing the path of travel, an electric circuit means for effecting an automatic actuation of said clipper blade assembly in response to a predetermined length of interception of said control zone, and reset means for preconditioning said circuit in response to the clearing of said control zone by all cut pieces, said electric circuit means being inoperative to effect said actuation when said control zone is not preconditioned, each said mated photoelectric cell and beam being correlated to one of a series of desired automatic veneer cut sizes and each being connected selectively in parallel with said circuit to preselect a corresponding control zone size so that said preselected zone must be substantially blanketed to effect an automatic actuation of said clipper blade assembly.

2. In an automatic veneer clipper having a reciprocable clipper blade assembly and a path of travel defined by correlated feed belt means for feeding a continuous sheet to said reciprocable clipper blade assembly and off-bearing belt means for conveying cut pieces therefrom, a spaced plurality of mated photoelectric cells and beams projecting across the off-bearing portion of said path to define a control zone interceptable by veneer traversing the path of travel, an electric circuit means preconditionable to effect an automatic reciprocation of said clipper blade assembly in response to interception of said control zone, manual means for reciprocating said clipper blade irrespective of the condition of said control zone, and antifalse cut means including a reset photoelectric cell and beam adjacent the terminal end of said control zone for preconditioning said circuit in response to the clearing of said control zone by all cut pieces including those which may have been cut by said manual means, each said mated photoelectric cell and beam being correlated to one of a series of desired automatic veneer cut sizes and each being connectable selectively in parallel with said circuit to preselect a corresponding control zone size so that said preselected zone must be substantially blanketed to effect an automatic actuation of said clipper blade assembly.

3. In an automatic veneer clipper having a clipper blade assembly and a path of travel defined by correlated feed means for feeding a continuous sheet to said clipper blade assembly and off-bearing means for conveying cut pieces therefrom, a spaced plurality of mated photoelectric cells and beams projecting across the off-bearing portion of said path to define a control zone interceptable by veneer traversing the path of travel, said photoelectric cells being connectable selectively with an electric circuit means which when preconditioned will effect an automatic actuation of said clipper blade assembly in response to a preselected length of interception of said control zone, said electric circuit means being preconditioned by a locking relay means movable between positions rendering said control zone active and inactive, selectively, as dictated by a reset photoelectric cell and beam joined thereto and projecting across said path of travel adjacent said control zone, and means controlled by said clipper blade assembly for normally locking said relay in said active position and for unlocking said relay when said assembly begins a cutting stroke.

4. In an automatic veneer clipper having a reciprocable clipper blade assembly and a path of travel defined by correleated feed belt means for feeding a flaw containing continuous sheet to said reciprocable clipper blade assembly and off-bearing belt means for conveying cut pieces therefrom, said clipper blade being operative to cut pieces from said sheet while the sheet is moving, a spaced plurality of mated photoelectric cells and beams projecting across the off-bearing portion of said path to define a control zone interceptable by veneer traversing the path of travel, said photoelectric cells being connectable selectively in parallel with an electric circuit means which when preconditioned will effect an automatic reciprocation of said clipper blade assembly in response to an interception of said control zone, said electric circuit means being preconditioned by a locking relay means movable between positions rendering said control zone active and inactive, selectively, as dictated by a reset photoelectric cell and beam joined thereto and projecting across said path of travel adjacent the terminal end of said control zone, manual means for reciprocating said clipper blade assembly to cut flaws from said sheet, and means controlled by the reciprocation of said clipper blade assembly for normally locking said relay in said active posi-

tion and for unlocking said relay when said assembly begins a reciprocal cutting stroke.

5. In combination with the operable blade assembly of an automatic clipper, correlated feed and off-bearing means, respectively, for feeding a sheet to and conveying cut pieces from said blade assembly, an electric circuit means for actuating said assembly in response to the interception of a preselected group of a plurality of photoelectric cells having beams projecting across spaced portions of said off-bearing means, said photoelectric cells being joined to said circuit in parallel so that said preselected group must be blanketed before said assembly is actuated, antifalse cut means controlled by the movements of said blade assembly for rendering said circuit inoperative to make further automatic cuts each time said assembly begins a cutting stroke, and reset means projecting across said off-bearing means adjacent said cells for rendering said circuit operative to make further automatic cuts in response to the passage of a cut piece.

6. In combination with an automatic clipper mechanism having a blade assembly which is operable to cut a moving sheet of work material, longitudinally aligned feed and off-bearing conveyor means mounted adjacent said blade assembly to move a sheet of work material unidirectionally past the latter, an electric circuit means joined to said clipper mechanism to actuate said blade assembly in response to the interception of a preselected group of a plurality of photoelectric cells having beams projecting across spaced portions of said off-bearing means, manual means for actuating said blade assembly, antifalse cut means including a locking solenoid relay controlled in response to the movements of said blade assembly selectively to interrupt and complete said electric circuit, and reset means projecting across said off-bearing means adjacent said cells for actuating said antifalse cut means.

7. In combination with the operable blade assembly of an automatic clipper, correlated feed and off-bearing means, respectively, for feeding a sheet to and conveying cut pieces from said blade assembly, an electric circuit means for automatic actuation of said assembly in response to the interception of a preselected group of a plurality of photoelectric cells having beams projecting across spaced portions of said off-bearing means, said photoelectric cells being joined in parallel whereby said preselected group must be blanketed to affect said automatic actuation, said circuit having a manual control means for actuation of said blade assembly whereby flaws may be cut from said sheet, antifalse cut means controlled in response to the movements of said blade assembly selectively to interrupt and complete said electric circuit respectively to prevent and allow automatic actuation of said blade assembly, and reset means projecting across said off-bearing means on the off-bearing side of said cells for actuating said antifalse cut means in response to the passage of a cut piece.

8. In combination with a reciprocable clipper blade normally defining a position at rest above an elongated, moving work sheet, electrically controlled actuation means responsive to an electric pulse for reciprocating said blade from said position and back thereto to effect a slicing movement through said moving work sheet, and continuously operating feed and off-bearing means moving at dissimilar, constant velocities respectively to feed said elongated work sheet to and convey smaller, spaced, sliced pieces of said work away from said blade; a plurality of mated photoelectric cells and beams projecting across said off-bearing means to define a control zone interceptable by said moving work, electric circuit means joined to said actuation means and responsive to a blanket interception of a preselected portion of said control zone to reciprocate said blade by transmitting an electric pulse to said actuation means, said electric circuit means including a locking solenoid relay means movable between an active position completing the electric circuit to said actuation means and an inactive position interrupting the same, manual control means joined to said actuation means and supplementing said electric circuit means for reciprocating said blade irrespective of the condition of said control zone, blade controlled switch means normally locking said solenoid relay means in said active position to prevent movement thereof and operable in response to a reciprocal movement of said blade to unlock said solenoid relay means and permit movement of the latter to said inactive position, reset photoelectric cell and beam means mounted on the off-bearing side of said mated photoelectric cells and beams and operable, in response to an uninterrupted reception of said reset beam by said reset cell, to move said locking solenoid relay means, when unlocked, to said inactive position, said reset cell and beam means further being operative, in response to an interception of said reset beam by said smaller sliced pieces of work, to move said locking solenoid relay means to said active position, cell controlled solenoid relay means for preventing the movement of said locking solenoid relay means from said inactive position to said active position so long as said control zone preselected portion is blanketed, and make and break switch means in series with said electric circuit means and said actuation means and controlled by the reciprocal movements of said blade sequentially to break and make said electric circuit as said blade begins and completes a reciprocal slicing movement.

9. In combination, a reciprocable clipper blade normally at rest, actuation means responsive to an electric pulse for reciprocating said blade from said position and back thereto to effect a slicing movement through a moving work sheet, continuously operating feed and off-bearing means moving at dissimilar velocities respectively to feed said work sheet to and convey smaller, sliced pieces of said work away from said blade, a plurality of mated photoelectric cells and beams projecting across said off-bearing means to define a control zone interceptable by said moving work, electric circuit means joined to said actuation means and responsive to a blanket interception of a preselected portion of said control zone to reciprocate said blade by transmitting an electric actuation pulse to said actuation means, said electric circuit means including a locking solenoid relay means movable between an active position completing the electric circuit to said actuation means and an inactive position interrupting the same, manual control means joined to said actuation means and supplementing said electric circuit means for reciprocating said blade to slice said work, reset cell and beam means mounted on the off-bearing side of said mated cells and beams and operable, in response to an uninterrupted reception of said reset beam by said reset cell, to move said locking solenoid relay means to said inactive position, said reset cell and beam means

further being operative, in response to an interception of said reset beam to move said locking solenoid relay means to said active position, and make and break switch means in series with said electric circuit means and said actuation means and controlled by the reciprocal movements of said blade sequentially to break and make said electric circuit as said blade begins and completes a reciprocal slicing movement.

10. In combination with a clipper blade, said clipper blade normally being at rest and being mounted for reciprocal slicing movement, continuously operating feed and off-bearing means respectively for feeding an elongated work sheet past and conveying cut work pieces from said clipper blade to define a unidirectional path of travel, said feed and off-bearing means being operable at constant, different velocities, a plurality of photoelectric cells having mated beams projecting across spaced portions of said off-bearing means for interception by said work, an electric circuit means intermittently and automatically operable to reciprocate said clipper blade in response to the blanket interception by said continuous sheet of a preselected group defined by less than all of said beams, said clipper blade being operable to slice said work sheet while the sheet is moving at the velocity of said feed means, locking solenoid relay means joined in series with said electric circuit means and movable between an active position completing said electric circuit and an inactive position interrupting the same, and reset means including a reset photoelectric cell having a mated beam projecting across said continuously operating means at a point on the off-bearing side of said mated cells and beams selectively for moving said locking solenoid relay means between said two positions in response to the movement of said work with respect to said reset beam.

11. In combination with a clipper blade, said clipper blade normally being at rest and being mounted for reciprocal slicing movement, continuously operating means for feeding an elongated work sheet past said clipper blade to define a unidirectional path of travel for said work, a plurality of photoelectric cells having mated beams projecting across said continuously operating means for interception by said work, an electric circuit means intermittently and automatically operable to reciprocate said clipper blade in response to the blanket interception by said continuous sheet of a preselected group of said beams, locking solenoid relay means movable between an active position completing said electric circuit and an inactive position interrupting the same, and reset means including a reset photoelectric cell having a mated beam projecting across said continuously operating means selectively for moving said locking solenoid relay means between said two positions in response to the movement of said work with respect to the interception of said reset beam.

12. A clipper control, comprising a clipper blade having electric actuation means for reciprocating said blade, means continuously for moving an elongated piece of work past said blade at a constant velocity, said blade being operable to cut said work while the work is moving, automatic means including a plurality of photoelectric cells for energizing said electric actuation means in response to a blanket interception of the cells by said work, manual means independent of said automatic means for energizing said electric actuation means, and antifalse cut means responsive to the position of said work and to the movement of said blade selectively to prevent operation of said automatic means and to allow operation thereof, said antifalse cut means including an electric relay controlled switch joined in series with said automatic means and electric actuation means.

BURTON G. PRICE.
KENNETH C. DESLER.

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