Dec. 11, 1962 C. D. KOHLER 3,067,885

AUTOMATIC PANEL FEEDER

Filed Feb. 24, 1959 3 Sheets-Sheet 1

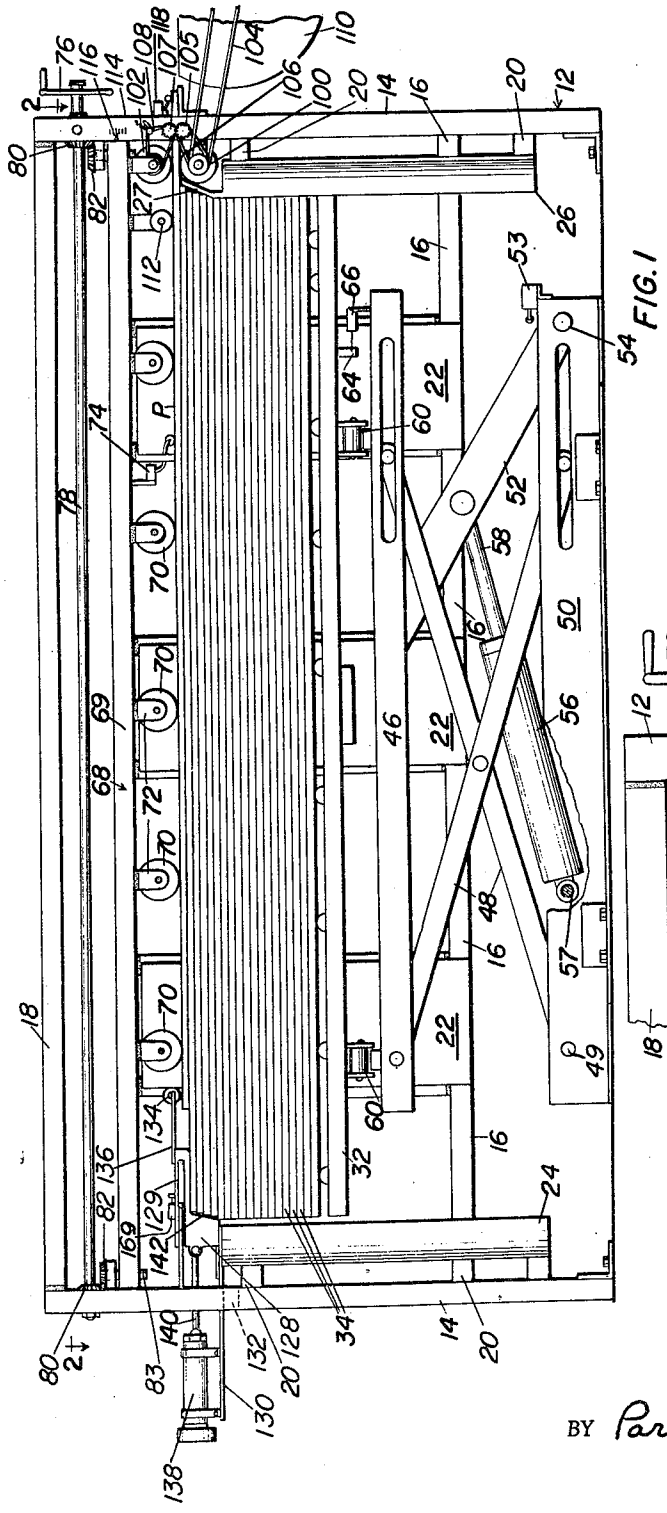

FIG. 1

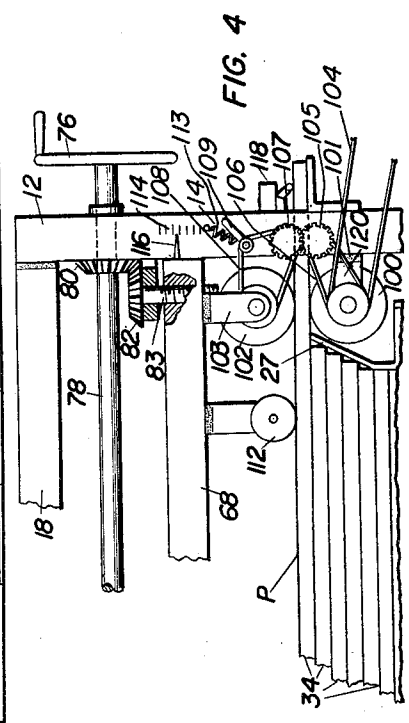

FIG. 4

INVENTOR
Conrad D Kohler

BY Parker & Philpitt

ATTORNEYS

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AUTOMATIC PANEL FEEDER

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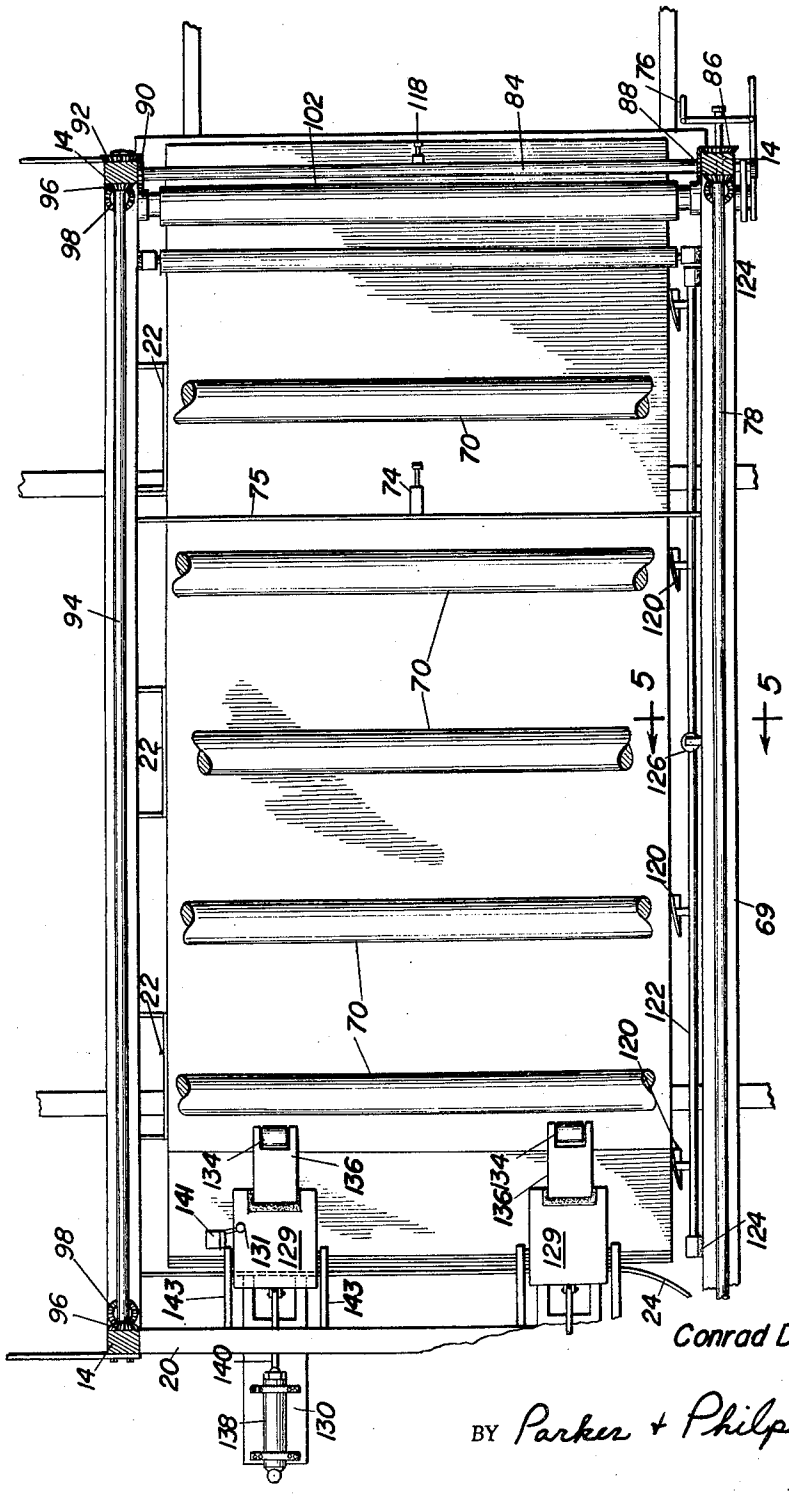


FIG. 2

INVENTOR
Conrad D Kohler

BY Parker & Philpitt

ATTORNEYS

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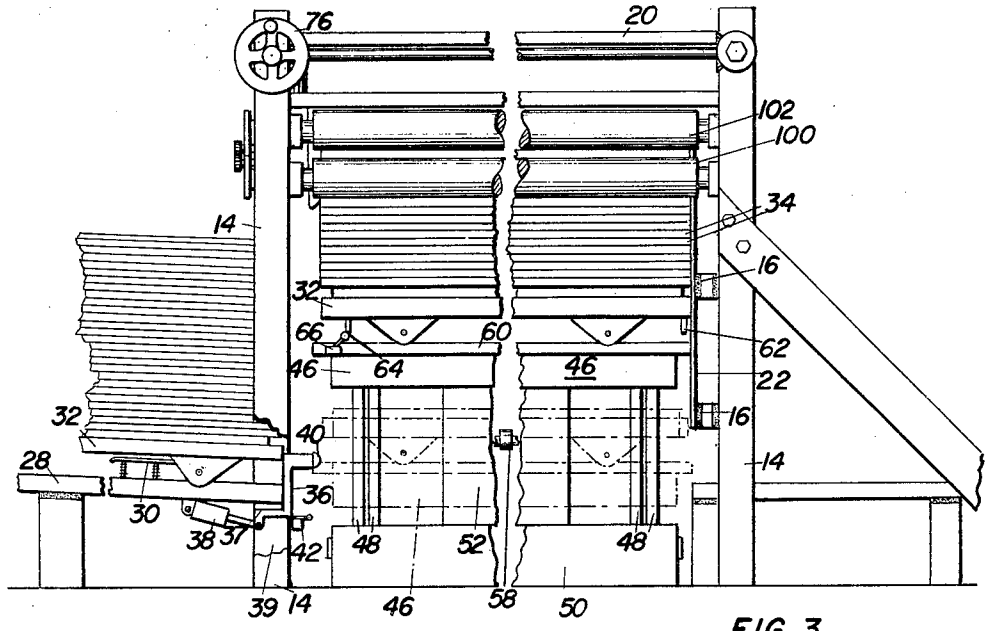


FIG. 3

FIG 6

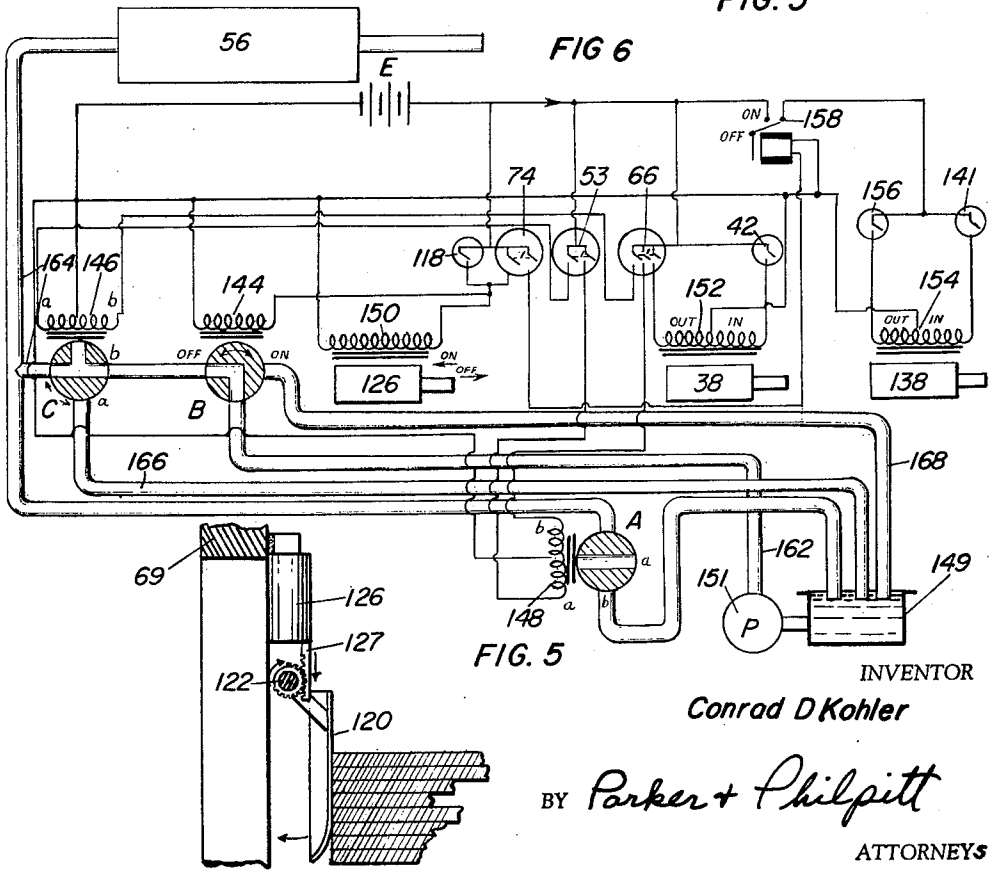


FIG. 5

INVENTOR

Conrad D Kohler

BY Parker + Philpitt

ATTORNEYS

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3,067,885

# AUTOMATIC PANEL FEEDER

Conrad D. Kohler, R.R. 2, Woodland Road, Sheboygan, Wis.

Filed Feb. 24, 1959, Ser. No. 795,238
13 Claims. (Cl. 214—8.5)

This invention generally relates to an automatic panel feeder, and more particularly pertains to an apparatus for automatically feeding rough panels of plywood to a trimming machine.

In accordance with conventional practice, rough plywood panels are fed to a first edge trim machine that is adapted to trim one pair of opposite sides of the panel, after which the direction of movement of the panel is transferred 90° and the ends of the panel are equalized by being fed, behind suitably provided dogs, on a second crosscut trim saw machine; the dogs being provided for purposes of maintaining positive control of the cut in order to achieve absolute squareness in the panel. Since all four edges of the panel are rough when the panel is fed into the first trim machine, positive control of the panel is not necessary, therefore the use of dogs is omitted in the first machine in favor of either rubber-faced plates or a corrugated chain. However, in order to achieve absolute square cuts relative to the side trim in the first machine, the second machine is provided with means whereby the panel is picked up in front of dogs and is pushed through the cutters in the second machine. It is therefore necessary that the timing of the panel feed to the first machine be regulated by the position of the dogs on the second machine in pushing it through the cutters of the second machine. It is accordingly desirable and one of the purposes of this invention, to provide a means whereby a panel can be fed to the first machine in response to a given position of the dogs on the second machine so that there will be no halt or intermittent feed action in the second machine, thereby speeding up the overall cutting and trimming processes.

Accordingly, the instant invention provides an apparatus adapted to feed rough plywood panels to a first trim machine in response to the position of the feed dogs on the second trim machine. More specifically, the instant invention includes means for stacking a plurality of rough plywood panels, carried on a dolly, on an elevator platform adapted to rise in such a way as to place the panels in juxtaposition to a pair of push feeder members, which are adapted to selectively push a single panel into a feed means that feeds the panel onto the first trim machine. The feeding occurs in response to the position of the feed dogs on the second trim machine. The instant apparatus includes means for feeding panels of varying thickness, and also includes a means to insure that the panels are fed either one at a time or in controlled stacks of several panels to the first trim machine. It is pointed out that the aforementioned elevator platform rises as either a single panel or a group of several panels are fed off the stack to bring a succeeding panel or panels into position. When the last (bottom) panel has been fed from the elevator platform, suitable automatic means causes the platform to drop to its lowermost position so that the empty dolly may be pushed from the machine, and a new, fully loaded dolly placed thereon, so that the feeding sequence may progress with a new stack of panels.

It is accordingly an object of this invention to provide an automatic panel feeder adapted to overcome the disadvantages inherent in the prior art panel feeders.

Still another object of this invention is to provide an automatic panel feeder adapted to feed panels either one at a time or several at one time from a stack containing



a plurality of such panels, said panels being fed to plywood trimming machines.

A further object of this invention is to provide an automatic panel feeder having an elevator platform means for raising a plurality of stacked panels to a feeder means so that said panels are fed either one at a time or in multiples from the machines, and including a means for lowering the elevator platform when the last panel has been fed from the stack.

Still another object of this invention is to provide an automatic panel feeder for feeding plywood panels to panel trimming machine, said machines being arranged at right angles to one another for sequentially making right angle cuts at the edges of said panel, the operation of the instant panel feeder being governed by the position of a first cut panel or panels relative to its time of entry into the second panel trimming machine.

An added object of this invention is to provide an automatic panel feeder adapted to sequentially feed a panel or panels from a plurality of panels stacked on a dolly removably received by the feeder, said panel feeder simultaneously ejecting an empty dolly after the last panel has been fed therefrom and admit another fully loaded dolly to the feeder.

Additional objects and many of the attendant features of this invention will be better understood upon consideration of the following detailed description and drawings wherein:

FIGURE 1 is a side elevational view of the instant invention partially broken away;

FIGURE 2 is a plan view partially broken away of the instant invention taken on line 2—2 of FIGURE 1;

FIGURE 3 is an end view of the instant invention, as viewed from the right hand side in FIGURE 1;

FIGURE 4 is an enlarged elevational view, partially broken away, of a portion of the structure shown at the right hand side of FIGURE 1;

FIGURE 5 is a sectional view taken on line 5—5 of FIGURE 2; and

FIGURE 6 is a schematic diagram of the electrical and hydraulic control system which can be used in conjunction with the instant invention.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views there is shown in FIGURE 1 a view of a panel feeder **12** constructed in accordance with the instant invention. The panel feeder **12** is supported by four spaced vertical posts **14** that are bolted or otherwise fixedly attached to the floor. Each of the vertical posts **14** is formed of any suitable configuration of structural member, such as either a box beam or a channel member. A pair of horizontal beams **16** are attached at their respective ends to a pair of the vertical posts **14**, as can be seen in FIGURE 3, and extend longitudinally of the apparatus. In addition, a pair of upper longitudinal beams **18** of similar construction likewise each have their respective ends fixedly attached to the vertical posts **14** at opposite sides of the feeder **12**, and transversely extending beams **20** are attached to the vertical posts **14** at the left hand end of the feeder **12** (see FIGURE 2). Thus the beam elements **14**, **16**, **18** and **20** serve to provide a framework for the instant structure.

A plurality of vertical plates **22** are fixedly attached by welding or the like to the inner face of each of the longitudinal beams **16**, said plates being hereinafter referred to as fence plates, since they are adapted to arrest and align a stack of plywood panels as they are rolled into the feeder **12**. At the respective ends of the apparatus **12** there are provided curved guide plates **24** and **26**, said guide plates serving to center a load of plywood panels within the feeder apparatus as the load

rolls into said apparatus. It is pointed out that the right hand plate 26 has a forwardly bent portion 27 at its upper end and that said plate constitutes a stationary panel restraining fence.

The instant apparatus further includes a pair of loading rails 28 having a spring-loaded shoe 30 on its upper surface for arresting movement of a loaded dolly 32 of plywood panels 34 as it moves down the rails 28 toward the feeder 12. At the right hand end of the rails 28, as viewed in FIGURE 3, there is a pair of control gates 36 that are adapted to stop the loaded dolly 32 as it rolls toward the feeder 12, so as to prevent entry of the dolly into the feeder 12 as long as another dolly is already resting thereon. The gate 36, shown in FIGURE 3, is adapted to be retracted from the dolly arresting position, shown in FIGURE 3, by means of a pair of double acting air cylinders 38, only one of which is shown, attached to the bottom of the rails 28, said air cylinders 38 being actuated in a manner hereinafter set forth and each having its armature connected to a gate 36. The gates 36 are substantially Z in shape and are respectively pivotally connected by pivots 37 to the vertical posts 39 upon which rails 28 are supported. Each gate 36 is provided, at its upper end, with a resilient bumper 40. The bumpers 40 serve to push an empty dolly 32 out of the feeder 12 when the empty dolly is in its lowermost position, all of which will be described in greater detail hereinafter under the heading of "Operation of the Apparatus." A microswitch 42 is attached to the right hand side of the loading rails 28, and is so connected as to actuate the air cylinders 38.

The feeder 12 itself includes a collapsible elevator 44 having an elevator platform 46 connected by a suitable and conventional scissors member 48 pivotally connected by a pivot 49 to a base member 50. The platform 46 is adapted to be raised by a lift plate 52 which has one end pivotally connected at 54 to the base 50, said plate 52 having its upper end in sliding contact with the under surface of the platform 46. The lift plate 52 is actuated by a hydraulic lift cylinder 56, having one end pivotally connected to the base member 50 at 57 and having an armature 58 pivotally connected to the lift plate 52.

When the elevator platform 46 has been raised to its uppermost position, the lift plate 52 is adapted to trip a microswitch 53 which, in a manner hereinafter described, causes the cylinder 56 to be deactivated so that the elevator platform is allowed to drop to its lowermost position.

The upper surface of the elevator platform 46 is provided with a pair of spaced tracks 60 upon which dolly wheels of dolly 32 are adapted to roll as the dolly enters the feeder 12 from the loading rails 28. It is pointed out that the dolly 32 is provided with a stop-detent 62 extending downwardly from its right hand end, as viewed in FIGURE 3, and a switch actuating detent 64 extending downwardly from the left hand end of the dolly. The stop-detent 62, in conjunction with the gates 36, serves to arrest movement of a full dolly onto the elevator platform 46 as the dolly rolls toward the feeder 12. The detent 64 serves to actuate a microswitch 66 on the upper left hand side of the platform 46, as can be most clearly seen in FIGURE 3. The microswitch 66 is connected to a suitable solenoid valve, hereinafter described, which in turn actuates the lift cylinder 56, said switch 66 being closed when it is actuated by the detent 64 as a full dolly rolls onto the platform 46. Closure of the switch 66 actuates the lift cylinder 56, causing the loaded elevator platform to be raised into panel feeding position. The feeding position is at any level of the elevator dependent upon the height of the stack being fed, but always at a level where the top of dolly 32 is at a higher level than the bottom of the impact plates 22, thus not only squaring the stack 34, but prohibiting dolly 32 from jamming the elevator assembly by being caught in the space beneath the lower edge of the plates 22.

A panel hold-down frame 68, having longitudinally extending beams 69, is mounted for up and down movement at the upper end of the feeder 12, said hold-down frame being provided with a plurality of unyielding restraining means, transversely extending hold-down rollers 70, adapted to contact the uppermost panel P on the dolly 32. The opposite ends of the hold-down rollers 70 are attached to a plurality of downwardly extending bracket members 72, which are fixedly attached to the beams 69. The hold down frame 68 is also provided with a microswitch 74, which is attached to a bar 75 extending between the beams 69 and is adapted to be contacted by the uppermost panel on the stack 34. The microswitch 74 is suitably connected, in a manner hereinafter described, to means adapted to arrest upward movement of the elevator platform 46 upon contact of the panel P with the switch 74. The hold down frame 68 is adapted to be raised and lowered through a suitably provided linkage actuated by a crank 76. When the crank 76 is rotated it drives a shaft 78 to each end of which is attached a bevel gear 80. Each of the bevel gears 80 is in driving contact with a bevel gear 82 which is drivingly connected to a threaded shaft 83 threadedly engaged with the frame 68; thus, when the shaft 78 is rotated by crank 76, rotation of the beveled gears 82 results, which in turn causes the frame 68 to be either raised or lowered, as desired. To insure an equal lift force on all four corners of the frame 68, a counter shaft 84 is drivably connected to the crank 76 through beveled gears 86 and 88, said shaft 84 in turn being connected through suitable beveled gears 90 and 92 to a shaft 94 which is parallel to shaft 78 at the opposite side of the feeder 12. The shaft 94 is suitably connected through beveled gears 96 and 98 to the frame 68 in the same manner as gears 80 and 82.

At the right hand end of the feeder 12 there is a pair of feed rollers 100 and 102, which are driven through belts 104, 106 and 108 from a first trim machine 110 through a pair of meshed gears 105 and 107. It is pointed out that the belt 108 passes over an idler roller 109 having the axle thereof located in a slot 111 in the post 14. The belt 108 is held under tension at all times when the frame 68 is either raised or lowered by a spring 113 having one end attached to the slidable idler roller 109, and the other end to the post 14. The roller 100 is attached to the posts 14 through brackets 101 on the feeder 12, while the roller 102 is attached through bracket 103, to the hold down frame 68. Rollers 100 and 102 feed the panels off the stack 36 in a manner described below. The hold down frame 68 is further provided with a thickness-determining roller 112 rotatably attached to the frame 68 adjacent to the feed rollers 100 and 102. The thickness of the panel to be fed can be adjusted on a gauge and pointer arrangement 114 and 116, pointer 116 being fixedly attached to the hold down frame 68, and the gauge 114 being etched or otherwise engraved on the post 14. It is emphasized that the roller 112 is always in contact with the uppermost panel P on the stack 34 when said panel is being fed from a machine 12. An additional microswitch 118 is attached to the right hand end of the feeder 12 between the vertical posts 14, said microswitch 118 being actuated by the panel P as it is being fed from the machine.

It is pointed out that in order to properly align the panels 34 against the fence plates 22, the instant apparatus is provided with a plurality of positioner arms 120, located adjacent the upper side of the panel feeder 12. The positioner arms 120 are each fixedly attached to a rotatable shaft 122, having its opposite ends journaled in bearings 124, fixedly attached to the beam 69 (see FIGURE 2), not shown in FIGURE 1 in order to clarify said figure. The shaft 122 is actuated by a double-acting air cylinder

126 also attached to beam 69 and having the armature 127 thereof drivably connected with the shaft 122 by means of a rack and pinion arrangement (FIGURE 5). The positioner arms 120 are activated through the microswitch 74 in a manner hereinafter described.

Actual feeding of the panels from the stack 34 is instituted by a pair of pusher shoes 128 slidably mounted on a pair of supporting brackets 130, which are fixedly attached to a cross frame element 132, which is connected at its opposite ends to the respective side posts 14 located at the left hand side of the panel feeder, as viewed in FIGURES 1 and 2. The feed shoes 128 each have a pusher finger 129 and a guide wheel 134 attached thereto and extending forwardly therefrom at the end of a bracket 136. The guide wheels 134 serve to hold down the left hand end of the uppermost plywood panel P. While the fingers 129 are shown to be of thickness to feed one panel, it is emphasized that they may be made thick enough to feed any desired number of panels at a time. The feed shoes 128 are each actuated by double acting air cylinders 138, fixedly mounted on the brackets 130, and having the armature 140 thereof connected to the feed shoes 128. It is pointed out that each feed shoe is provided with an angled surface 142 at its leading edge, which surface 142 serves to break loose a number of the panels at the top of the stack 34, in the event the panels have become stuck together through the presence of excessive glue therebetween.

In order to stop and reverse the action of the cylinders 138, one of the fingers 129 has an upwardly extending detent 131 fixedly attached to its upper surface, said detent being adapted to close a microswitch 141 fixedly attached to one of a pair of guide bars 143 associated with the fingers 129. Closure of the switch 141 serves, in a manner hereinafter described, to reverse the action of the cylinders 138 and thus withdraw the fingers 129.

Referring now to FIGURE 6, which is a schematic diagram of the electrical and hydraulic portions of the instant invention, there is provided in the hydraulic system three solenoid actuated valves A, B and C. A single action actuating solenoid 144 is associated with the valve B and is connected, through the normally open microswitches 74 and 118, across a D.C. power source E. The valve C is actuated by a double action solenoid 146 having the opposite ends thereof selectively connectable to one side of the power source E through the switches 53 and 66 respectively. The valve A is provided with a double action solenoid 148 having the opposite ends thereof selectively connectable to one side of the power source E by means of the switches 53 and 66. It is also pointed out that the valves A, B and C are associated with a fluid reservoir 149 having a pump 151 connected thereto, and are adapted to selectively feed fluid to, or allow exit of fluid from, the lift cylinder 56 through the pipelines 162, 164, 166 and 168, in a manner hereinafter set forth in greater detail.

The spring loaded alignment cylinder 126 is activated by a single action solenoid 150 connected through the switches 74 and 118 across the power source E. In addition, the gate actuating cylinders 38 are each actuated in opposite directions by a double action solenoid 152 having its opposite ends selectively connectable to one side of the power source E through the switches 42 and 66 respectively.

In addition, the pusher cylinders 138 are actuated by a double action solenoid 154 having its respective ends selectively connectable to one side of the power source E through the switch 141 on the panel feeder, and a switch 156 on the second trim machine, which latter switch is actuated by the position of the dogs on said second machine. The switches 141 and 156 are in turn connected to E through what might be termed a safety switch 158, which is of the relay type. The switch 158 is closed by the closure of the switch 74 which serves to complete the circuit for the relay actuating coil.

Thus the switch 158 is closed only when the topmost panel on the stack 34 is in position to close the switch 74 so that the cylinders 138 can be actuated only when the topmost panel is in proper feeding position.

*Operation of the Apparatus*

In describing the operation of the instant invention, reference is had to the schematic diagram in FIGURE 5 and the showings in FIGURES 1 through 3 in particular. In describing the sequence of operation of the instant invention, it will be assumed that the elevator platform 46 is at its lowermost position, that is, in horizontal alignment with the upper surface of the loading rails 28. In operating the instant invention, a full dolly 32 is rolled onto the loading rails 28 until the stop detent 62 on said dolly is in abutment with the stop gates 36. When the elevator platform 46 drops to its lowermost position it trips the microswitch 42, which in turn actuates the solenoid 152 to cause the armature of the cylinder 38 to move in, causing the gates 36 to tilt free of the detent 62, thereby releasing the dolly 32 and allowing the same to roll onto the elevator platform 46. It is pointed out that just prior to entry of the dolly 32 onto the platform 46, the bumpers 40 push off an empty dolly, causing the same to roll off the elevator platform 46 beneath the fence plates 22.

Before proceeding further, it is pointed out that the hold down frame 68 is adjusted for the desired thickness of either a single panel P or a predetermined number of panels by adjusting, through the action of the crank 76, the distance between the roller 112 and the upper edge of the offset portion 27 on the arcuate plate 26.

As the loaded dolly 32 rolls onto the elevator platform 46, the downwardly extending detent 64 on the rear of said dolly trips the microswitch 66, which serves to simultaneously reverse the solenoid 152, causing the armature of the cylinder 38 to move in, closing the valve A and at the same time energizing the solenoid 146 to open the valve C to the lift cylinder 56 and the reservoir 149, through the valve B and the pipelines 162 and 164, thereby causing fluid to flow through the pipelines 162 and 164 into said cylinder and in turn causing said cylinder to lift the elevator platform 46 through the action of the lift plate 52. The platform 46 is in this manner raised to the point where a panel feeding cycle begins.

The elevator platform 46 continues to rise until the top panel P closes the microswitch 74, which energizes the solenoid 144, causing valve B to be rotated 90° counterclockwise, valve A remaining closed at the same time, thus causing the platform 46 to remain at this desired height by shutting off the cylinder 56 from the reservoir 149, and thereby locking therein, the fluid already contained therein. Simultaneously, the solenoid 150 is energized, causing the armature of the alignment cylinder 126 to be drawn inwardly, thereby causing the alignment arms 120 to push the top panels against the fence plates 22, which insures that the panels are all fed to the first machine 110 in the same lateral position. It is pointed out that the closure of the switch 74 also causes closure of the relay switch 158.

The top panel or group of panels is now in position to be fed to the first machine 110 when it is signalled to do so by the closure of the microswitch 156 on the second machine. When the switch 156 is closed the armatures of the air cylinders 138 are activated and move the pusher shoes 128 toward the top panel or panels, depending on the thickness of the shoes 128 with the guide wheels 134 riding on top of the top panel, thus insuring that only the desired number of panels are fed at a time. The top panel or group of panels is pushed into the powered feed rollers 100 and 102 and at the same time the angled surface 142 on the pusher shoes breaks loose the panels following directly beneath the top group of panels, pushing said under panels against the offset 27 on plate 26. The steel thickness roller 112 at the discharge end of the

machine serves to hold the load firmly at the desired height so that only the desired number of panels are fed at a time, said roller 112 having been set at a specific height by use of the scale 114 and pointer 116. The outward movement of the pusher shoes is halted and reversed when the detent 131 on one of said shoes trips the switch 141 (see FIGURE 2) which, since the switch 156 has opened, reverses the solenoid 154 and causes reversal of movement of the armature of each cylinder 138.

The powered feed rollers 100 and 102 then proceed to feed the top panel or group of panels to the first trim machine 110 where the panel or panels are picked up by a power-driven chain on said machine and fed to the cutters. As the panel or group of panels feeds through the rollers 100 and 102 the topmost panel finally moves free of the microswitch 74, causing said switch to open. However, at the same time, switch 118 is still closed by the panel P, thereby retaining the valve B in a counterclockwise rotated position, thus insuring that the elevator mechanism does not proceed to lift the panels to a greater height. When the top panel clears the switch 118 both switches 74 and 118 are then open, thus deactivating the solenoid 144, causing the solenoid valve B to rotate clockwise 90°, and at the same time deactivating the solenoid 150, causing the armature of the alignment cylinder 126 to be reversed, allowing the alignment arms 120 to move away from the panels 34. At this point the switch 158 opens, deactivating the solenoid 154 and thus the cylinders 138. Since the valve B is now open to the reservoir 149 and the cylinder 56, fluid is pumped from the reservoir 149 to the lift cylinder 56, causing said cylinder to raise the elevator platform 46 until the next top panel contacts and closes the microswitch 74, at which time the valve B turns to the right and the platform 46 stops. The above cycle of feeding is repeated.

The above steps continue until the last panel releases the switch 118, thus deactivating the solenoid 144, causing the valve B to turn to the left, and in addition, elevator plate 52, in tripping microswitch 53, causes valve C to turn counterclockwise 90° or "*a*" position, thus short circuiting the pump 151 to the reservoir 149. The closure of the switch 53 also reverses the solenoid 148 opening the valve A, thereby allowing fluid to flow out of the lift cylinder 56 due to the downward weight of the elevator platform 46 on the lift plate 52. The platform 46 proceeds to drop until it contacts and closes the switch 42 on the rails 28, which activates the cylinder 38 in the manner described above, causing the next loaded dolly 32 to be released from the rails 28 to move onto the elevator platform 46. At the same time the bumpers 40 move the empty dolly 32 off the elevator platform 46 under the fence plates 22.

It is emphasized that the above cycle of operation may be repeated continuously as long as loaded dollys of plywood panels are fed onto the loading platform 28.

It should be obvious from the above description that the instant invention serves to provide a particularly useful panel feeding apparatus for use in conjunction with plywood trimming machines, which apparatus insures that panels are continuously fed to said machines without undue delay in the feeding cycle. The instant apparatus is substantially fool-proof and is fully automatic once it is started in operation; and, as pointed out above, operation will continue as long as loaded dollys of plywood panels are fed onto the loading platform 28.

In conclusion, while there has been illustrated and described a preferred embodiment of my invention, it is to be understood that since the various details of construction may obviously be varied considerably without really departing from the basic principles and teachings of this invention, I do not limit myself to the precise constructions herein disclosed and the right is specifically reserved to encompass all changes and modifications coming within the scope of the invention as defined in the appended claims.

What is claimed:

1. An automatic panel feeder adapted to sequentially feed a predetermined number of flat panels at one time from the top of a stack of panels comprising: a loading platform; a releasable gate means on said loading platform adapted to selectively hold thereon a movable dolly of stacked panels, an elevator platform, an elevator platform raising means connected to said platform, said elevator platform being adapted to selectively assume a position in alignment with the upper surface of said loading platform; an automatic means for releasing said gate means thereby releasing said dolly of panels from said loading platform for movement onto said elevator platform; a panel feed means adapted to feed the topmost number of panels from said stack onto an auxiliary machine; a panel pusher means adapted to move said topmost number of panels into feeding engagement with said feed means; an actuating means for actuating said elevator platform, raising means for raising said elevator platform until said topmost number of panels is positioned for engagement with said panel pusher means; an arresting means adapted to stop upward movement of said elevator platform when said topmost number of panels is in position for engagement with said pusher means; and automatic means for actuating said panel pusher means to push the topmost number of panels into feeding engagement with said panel feeding means; means for automatically actuating said elevator platform raising means upon complete clearance of said topmost number of panels from the panel feeder to raise said elevator platform a distance equal to the thickness of said number of panels, thereby bringing the next predetermined number of panels in the stack into alignment with said panel pusher means, whereby successive panels are adapted to be automatically, sequentially fed from the panel feeder, a detecting means adapted to lower said elevator platform to its lowermost position upon the feeding of the last panel on said stack from the panel feeder, and an ejector means for ejecting the empty dolly from the elevator platform when said elevator platform reaches its lowermost position, said ejector means and said gate means being simultaneously actuated so as to release a loaded dolly of panels from said loading platform for movement onto said elevator platform, whereby a successive stack of panels is adapted to be fed from the panel feeder without interruption.

2. An automatic panel feeder, as set forth in claim 1, wherein the elevator platform raising means comprises a lift member having one end bearing against the underside of the elevator platform, said lift member being actuated by a hydraulic lift cylinder, and wherein the means for arresting upward movement of said elevator platform comprises a microswitch located on the panel feeder above the topmost panel on the stack, said microswitch being adapted to be closed by said topmost panel, the closure of said microswitch actuating a valve means to close flow of fluid to said hydraulic lift cylinder.

3. An automatic panel feeder, as set forth in claim 1, wherein the means for arresting upward movement of said elevator platform comprises a first microswitch located at the intake side of said panel feeder means, and a second microswitch located at the discharge side of said panel feeder means, said first microswitch being adapted to be contacted and closed by said topmost panel as the elevator platform rises, said first and second microswitches being connected to a means adapted to stop the elevator platform raising apparatus, thereby arresting upward movement of the elevator platform upon closure of said switches whereby when said topmost number of panels is being fed from the panel feeder it closes both of said microswitches, thereby maintaining the elevator platform in arrested position until said topmost number of panels completely clears the panel feeder, including the second microswitch.

4. An automatic panel feeder as set forth in claim 3,

wherein the elevator platform raising means comprises a lift member driven by a hydraulic lift cylinder, and the lift arresting means includes a valve connected to said cylinder and is adapted to be closed in response to the closed position of said microswitches so as to arrest fluid flow to said cylinder and thus movement of said cylinder and therefore upward movement of elevator platform.

5. An automatic panel feeder, as set forth in claim 1, wherein the means for arresting upward movement of said elevator platform comprises a first microswitch located at the intake side of said panel feeder means, and a second microswitch located at the discharge side of said panel feeder means, said first microswitch being adapted to be contacted and closed by said topmost panel as the elevator platform rises, said first and second microswitches being connected to a means adapted to stop the elevator platform raising apparatus, thereby arresting upward movement of the elevator platform upon closure of said switches whereby when said topmost number of panels are being fed from the panel feeder it closes both of said microswitches, thereby maintaining the elevator platform in arrested position until said topmost panel completely clears the panel feeder, including the second microswitch.

6. An automatic panel feeder for consecutively feeding panels from the top of a stack of panels comprising:

(*a*) a main frame including vertical support members;

(*b*) an elevator means within said frame adapted to receive said stack of panels and to urge said stack upwardly in said frame;

(*c*) longitudinally extending beams mounted above said elevator on said vertical support members;

(*d*) unyielding restraining means dependent from said beams and disposed in a generally horizontal plane for positively limiting the upward movement of said stack by contacting the topmost panel therein;

(*e*) a stationary panel restraining fence secured to said frame adjacent one end of said elevator, said fence having a horizontal top edge spaced downwardly with respect to the plane of said restraining means;

(*f*) panel pusher means secured to said frame at the opposite end of said elevator for initiating movement of panels from the top of said stack by displacing them towards and across the top edge of said fence;

(*g*) panel feed means mounted on said frame and on said beams in position to receive panels displaced by said panel pusher, said panel feed means completing the removal of the panels displaced by said panel pusher means during the operation of said automatic panel feeder.

7. An automatic panel feeder as in claim 6 wherein means are provided for adjusting said restraining means vertically.

8. An automatic panel feeder as in claim 6 wherein said restraining means comprises a plurality of rollers having axes generally perpendicular to the direction of movement of said panels and having stack contacting surfaces which are substantially co-planar.

9. An automatic panel feeder as in claim 6 wherein said elevator means has a stack receiving position and panel feeding positions and wherein automatic means are provided to trigger the raising of said elevator means from said panel receiving position to panel feeding position in response to the entry of a stack of panels into said elevator.

10. An automatic panel feeder as in claim 9 wherein means are provided for automatically arresting the upward movement of said elevator when said stack reaches a panel feeding position.

11. An automatic panel feeder as in claim 9 wherein means are provided for automatically lowering said elevator to its stack receiving position when a stack of panels has been completely expelled from the machine.

12. A cyclic panel feeder adapted to sequentially feed a predetermined number of flat panels at a time from the top of a stack of panels, comprising:

(*a*) a frame;

(*b*) elevator means within said frame adapted to receive said stack of panels and to urge said stack upwardly in said frame;

(*c*) vertically adjustable, longitudinally extending beams mounted above said elevator means in said frame;

(*d*) a plurality of transverse, co-planar, hold-down rollers spaced longitudinally from one another along said beams and depending therefrom for positively limiting the upward movement of the said stack by contacting the topmost panel therein as the elevator means rises;

(*e*) means for interrupting the operation of said elevator when the top of said stack comes into contact with said hold-down rollers and for preventing further operation of said elevator until after a feeding cycle has progressed to the extent that the predetermined number of panels being fed during said cycle has cleared said stack;

(*f*) a stationary panel restraining fence secured to said frame adjacent one end of said elevator, said fence having a horizontal top edge spaced downwardly with respect to the plane of said restraining means;

(*g*) panel pusher means secured to said frame at the opposite end of said elevator for initiating movement of panels from the top of said stack by displacing them towards and across the top edge of said fence;

(*h*) panel feed means, including an upper feed roller mounted transversely on said beams in alignment with said hold-down rollers and a lower feed roller mounted upon said frame outside said fence, said feed rollers being in position to receive panels displaced by said panel pusher, said panel feed means being adapted to complete the removal of the predetermined number of panels displaced from said stack by said panel pusher means.

13. A cyclic panel feeder adapted to sequentially feed a predetermined number of flat panels at a time from the top of a stack of panels, comprising:

(*a*) a frame;

(*b*) elevator means within said frame adapted to selectively assume a loading position for receiving a dolly of stacked panels;

(*c*) means connected to said elevator means for initiating the operation of said elevator in an upward direction in response to the arrival of said dolly at its proper position on said elevator means, thus urging said stack upwardly in said frame;

(*d*) vertically adjustable, longitudinally extending beams mounted above said elevator means in said frame;

(*e*) unyielding restraining means dependent from said beams and disposed in a generally horizontal plane for positively limiting the upward movement of said stack by contacting the topmost panel therein, while permitting longitudinal movement of said topmost panel;

(*f*) means for interrupting the operation of said elevator when the top of said stack comes into contact with said restraining means and for preventing further operation of said elevator means until a feeding cycle has progressed to the extent that the predetermined number of panels being fed during said cycle has cleared said stack;

(*g*) a stationary panel restraining fence secured to said frame adjacent one end of said elevator, said fence having a horizontal top edge spaced downwardly with respect to the plane of said restraining means;

(*h*) panel pusher means secured to said frame at the opposite end of said elevator for initiating movement of panels from the top of said stack by displacing them towards and across the top edge of said fence;

(*i*) panel feed means mounted on said frame and on said beams in position to receive panels displaced by said panel pusher, said panel feed means completing the removal of panels displaced by said panel pusher means during a given cycle in the operation of said automatic panel feeder;

(*j*) means for detecting the exhaustion of said stack and for returning said elevator means to said loading position in response thereto.

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