April 21, 1936. E. PARKER 2,038,000

WOOD FABRICATING MACHINE

Filed June 22, 1935

Fig.1.

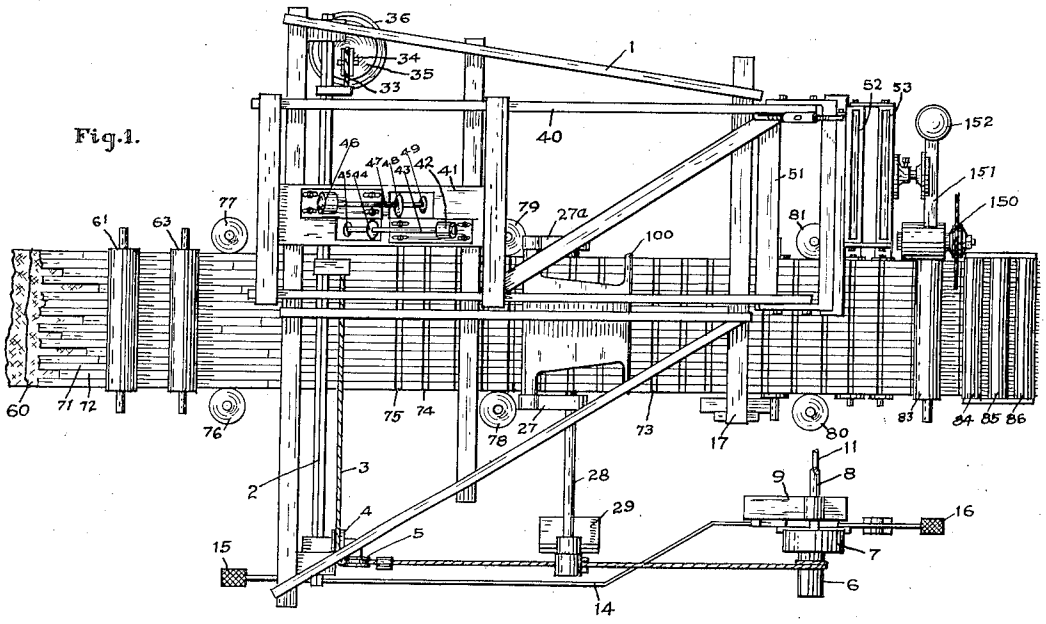
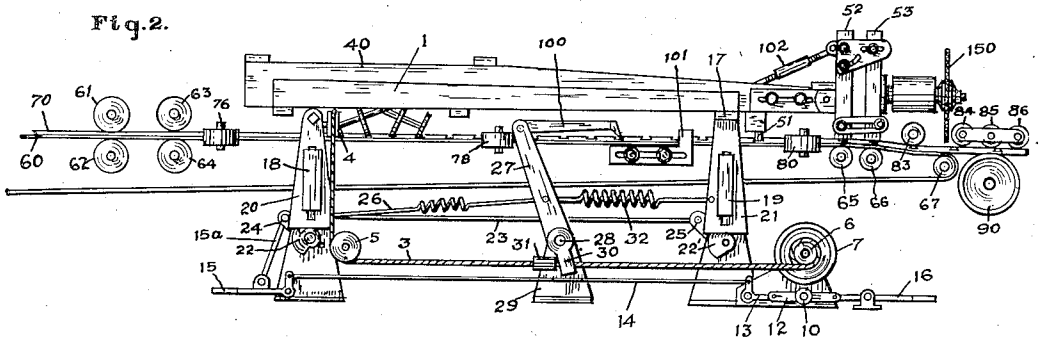


Fig.2.



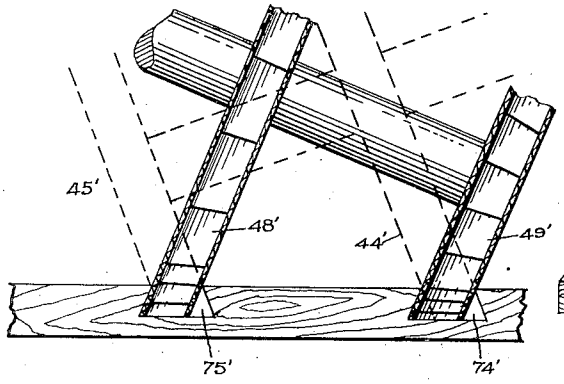
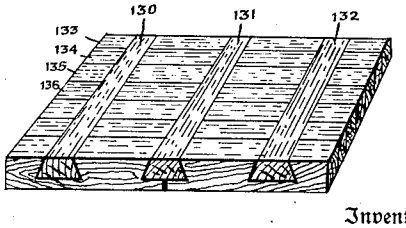


Fig.3.

Fig.4.



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WOOD FABRICATING MACHINE

Emmett Parker, Portland, Oreg.

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4 Claims. (Cl. 144—3)

My invention relates to improvements in wood fabricating machines in which narrow strips or sticks of wood are joined together by common bonds in lateral and end abutting relationship to form panels of unlimited length.

The principal object of my invention is the provision of a unit for the manufacture of the product above described which may be operated with a minimum of labor and which will produce uniform and smooth work.

A second object is the provision for use of lumber by-products now wasted.

A third object is the production of wood panels of distinctly superior appearance and durability.

Other objects and advantages of my invention will be apparent in the following discourse wherein the significance of the reference numerals in the accompanying drawing, details of construction and operation of a representative machine embodying my invention, and the particular advantages thereof are explained.

Figure 1 represents a view of the top of the machine from which parts of usual construction have been omitted.

Figure 2 represents a view of the side of the machine as illustrated in Figure 1.

Figure 3 represents a view of an enlarged fragment of a typical cutting tool, of the machine particularly illustrating the manner of engagement thereof with the work.

Figure 4 represents a view in perspective of the panel typical of the product of the machine.

A conveyor **60** of convenient design provides a work table upon which are assembled in end and lateral abutting relationship continuous courses of sticks as **71** and **72** in a manner to provide for the staggering of end joints. These sticks are conveniently trimmed to some length equal to multiples of a chosen unit of length. This conveyor is drawn into the machine intermittently by an action coordinated with the bonding operations.

Two pairs of rolls **61** and **62**, and **63** and **64** insure identity of motion of the conveyor **60** and the stock **71** and **72**. A pair of side rolls **76** and **77** compress the assembled sticks laterally as the stock passes therebetween.

Above the thus travelling stock and conveyor, a carriage **1** is mounted to reciprocate transversely. Mounted on the carriage **1** is a framework **40** upon which are adjustably mounted two motors **42** and **46** each driving an arbor as **43** and **47** respectively, symmetrically inclined from the horizontal. These arbors, **43** and **47**, each carry two cutter-heads **44** and **45**, and **48** and **49** respectively, of such dissimilar diameters and equal bevels as to provide for the disposition of the lowermost portions thereof in a plane parallel with but slightly below the plane of the upper surfaces of the sticks as **71** and **72**. This relationship is particularly illustrated in Figure 3. In this relationship, a forward stroke of the carriage **1** will provide for transversely grooving or dadoing the assembled sticks as **71** and **72** as illustrated in Figure 1 at **74** and **75**.

Since the two pairs of cutter-heads **44** and **45**, and **48** and **49** respectively, are symmetrically inclined from the horizontal, the cutter-heads **48** and **49** will engage the work as illustrated in Figure 3 by **48'** and **49'**, and the cutter-heads **44** and **45** will engage the work as **44'** and **45'** in a fashion complementary to the first two, and if the two pairs traverse the same grooves successively, a dovetail cross-section of the grooves as illustrated at **74'** and **75'** in Figure 3 will be provided. Also, with each movement of the conveyor **60** with its burden of assembled sticks as **71** and **72**, through a distance equal to twice the chosen unit, before mentioned, or the distance between grooves, the carriage **1** makes one effective transverse movement to form two complete dove-tail dado-channels in this wise.

The cutter-heads **44** and **45** cut two oblique channels across the stock in fresh wood; the cutter-heads **48** and **49** oppositely inclined and symmetrically formed traverse the grooves made by the cutter-heads **44** and **45** in the preceding stroke, thus completely forming two dove-tail dados with each effective stroke of the carriage **1**.

A pawl **100** engages alternate completed dado-grooves to move the stock and conveyor **60** through the machine between effective strokes of the carriage **1**; side-rolls **78**, **79**, **80**, and **81** retaining the stock is proper lateral relationship.

Attached to the opposite end of the framework **40** and in adjustable relationship with said cutter-heads are two hoppers containing keys of the form represented in Figure 4 at **130**, **131**, and **132**. These hoppers are adjustable in angular and linear spacing and are so adjusted as to feed two keys as **130** and **131** in Figure 4 into two adjacent dado-grooves at each effective stroke of the carriage **1**; this operation being simultaneous with the work of the cutter-heads before described.

To reduce the friction of the entering keys, two rolls **65** and **66** immediately beneath the hoppers **52** and **53**, and disposed in two different levels, act as fulcra over which the stock is bent by the roll **83** to open the dado-grooves slightly.

Attached to the hopper 53 is motor driven saw 150 mounted on the tilting-arm 151 and counterbalanced by the weight 152 so that the saw 150 may be lowered at will to cut off the fabricated stock into desired lengths at any particular effective stroke of the carriage 1.

Beyond the saw 150, a sander the drum of which is represented at 90 and the pressure rolls 84, 85, and 86, is appended to receive the stock cut to length and polish the same in the usual manner.

Because of the relatively great dimensions of a machine of this character proportioned to produce panels of practical dimensions, and the variable behavior of wood in process of working in the matter of size and form, it is not practical to attempt to rigidly relate the guided course of the carriage 1 to the required paths of the cutter-heads as determined by linear measurements from previously formed grooves separated by such distances as would be comprised in the expanse of a floor wherein the panels are required to match. It is necessary to provide a special device forming an important element in my invention as follows:

The frame-work 40 is slidably mounted upon the carriage 1 so that it may shift longitudinally with respect to the conveyor 60 or transversely of the direction of the movement of the carriage 1. In this movement, which is relatively slight, the frame-work 40 is actuated by entrance of a guide 51 mounted underneath the frame-work 40 into a previously cut dado-groove situated some ten or twelve feet distant from the groove about to be cut by the first entering cutter-head during the same stroke of the carriage 1. Thus, it may be depended upon that each ten or twelve feet of stock prepared will contain precisely the same number of grooves and keys and that succeeding runs of stock will match as to critical spacing of said keys used as well for decorative effects as for structural purposes.

The carriage 1 is slidably mounted at one end on the guide-rail 2 and supported at the opposite end upon two standards of which the front one 21 is shown in Figure 2. The slide 17 forms a sliding contact bearing on the said standards as 21.

The carriage 1 is actuated in the forward or effective stroke by a power mechanism conveniently constructed as follows:

A power driven shaft 11 carrying a friction wheel 10 is mounted in a yoke 12 in turn supported at opposite ends by a pedal lever 16 and a bell-crank 13 connected by the rod 14 to a pedal 15 in such a manner as to provide for the contacting of said friction wheel 10 with a driven friction wheel 7 when both pedals 15 and 16 are depressed.

Attached to the driven wheel 7 is a drum 6 adapted for reeling the rope 3 in turn passing over the sheaves 5 and 4 to a suitable place of attachment of the end thereof to the guide-rail 2 secured to the carriage 1 and slidably mounted in the standards as 20. When both pedals 15 and 16 are depressed the carriage 1 will move forward through an effective stroke.

A weight 35 suspended in a dash-pot 36 upon the rope 33 led over the sheave 34 and attached to the guide-rail 2 serves to return the carriage 1 to its rearward position.

To provide for raising the carriage and cutter-heads clear of the work during the return stroke of the carriage while the conveyor and stock thereupon are moving forward a special mechanism is required to operate coordinately with the movement of the carriage during the return stroke.

A lug 31 secured to the rope 3 engages a depending yoke 30 during the effective or forward stroke of the carriage near the forward limit of travel of the latter serving to rotate the shaft 28 in a counterclockwise direction as viewed in Figure 2. The crank-arms 27 and 27a are rigidly secured to the shaft 28 and at the upper ends thereof are pivotally attached to opposite sides of the pawl 100 which upon engagement of the lug 31 with the yoke 30, recedes to the position shown in Figure 2. Upon return of the carriage in the rearward stroke the lug 31 is disengaged from the yoke 30 thus allowing the spring 32 to actuate the crank-arm 27, pawl 100, stock in process as the sticks 71 and 72, and conveyor 60 in the feeding movement when the stock moves from left to right.

If for any reason, the motion of the conveyor and stock thereupon is arrested or retarded, the carriage 1 may move rearwardly while the pawl 100 and attached members remain in the retracted position without damage to any part of the machine. Such relative positions of the pawl 100 and carriage 1 are shown in Figure 1.

Two cams 22 and 22' operate to lift the carriage 1 and cutter-heads mounted thereupon above the work during the return stroke of the carriage. These cams 22 and 22' are tied together by means of the cranks 24 and 25 secured to the respective shafts of said cams, and the tie-rod 23 connecting said cranks. The cams are actuated by means of a spring-rod 26 pivotally attached at opposite ends to the crank 24 and pawl-crank 27 respectively. Thus when the carriage 1 begins to recede in rearward motion the pawl-crank 27 and cams 22 and 22' immediately rotated in a clockwise direction effecting the feeding of the stock and the lifting of the carriage. The succeeding effective or forward stroke is controlled by the two pedals 15 and 16. When the pedal 15 is depressed the cams 22 and 22' are actuated in anti-clockwise rotation and the carriage is lowered to the cutting position by means of the link 15a pivotally attached at opposite ends to the pedal 15 and crank 24 respectively. The carriage, however, will not begin to move forward into the cut until the pedal 16 is also depressed as before explained.

It will be observed that the adjustment of the various elements of the machine acting directly upon the stock are referred to the guide 51 and not to the frame of the machine. The spacing of the cutter-heads 45, 44, 48, and 49, the hoppers 52 and 53, the cut-off saw 150, and the relationship of each thereof to the guide 51, are all adjustable to provide for precise registration of the successive operations, and as well to provide for variant spacings of the keys as 130, 131, and 132 in Figure 4 within practicable limits. It will also be apparent that various thicknesses of stock may be handled by the provision of obvious expedients well understood in the art.

The precise form of mechanism and manner of construction thereof illustrated and described is representative of the numerous equivalents of the various elements of the complete machine and is not intended to limit the scope of the invention which may obviously be extended to comprise many special forms by the application of engineering skill and the embodiment of many expedients commonly practiced in machine design.

Applicant does, however, contemplate as his in-

vention the particular combination of woodworking elements arranged to operate in the sequence and coordinated relationship explained, and as well, the inherent method of fabricating the panels in continuous lengths.

Having described my invention, what I claim is:

1. A fabricating machine comprising, a conveyor upon which sticks for fabrication are assembled, a transversely reciprocatory carriage mounted above said conveyor, cutter-heads mounted upon said carriage adapted for grooving stock borne by said conveyor, a hopper containing keys mounted on the carriage to move therewith and means to insert the keys in said grooves during the reciprocatory movement of the carriage in one direction, and means to actuate said carriage and said conveyor in alternate sequence.

2. A fabricating machine comprising, a conveyor upon which sticks for fabrication are assembled, a transversely reciprocatory carriage mounted above said conveyor, a framework mounted upon said carriage capable of independent longitudinal motion, cutter-heads mounted upon said framework adapted for grooving stock borne by said conveyor, a hopper containing keys mounted on the carriage to move therewith and means to insert the keys in said grooves during the reciprocatory movement of the carriage in one direction, a guide attached to said framework adapted for engaging said grooves in succession to control the spacing of said grooves, and means to actuate said carriage and said conveyor in alternate sequence.

3. A fabricating machine comprising, a conveyor upon which sticks for fabrication are assembled, a transversely reciprocatory carriage mounted above said conveyor, a framework mounted upon said carriage capable of independent longitudinal movement, cutter-heads mounted upon said framework adapted for grooving stock borne by said conveyor, a hopper containing keys mounted on the carriage to move therewith and means to insert the keys in said grooves during the reciprocatory movement of the carriage in one direction, a cut-off saw attached to said framework adapted for elective engagement with said stock borne by said conveyor, a guide attached to said framework adapted for gaging the spacing of said grooves, and means to actuate said carriage and said conveyor in alternate sequence, wherein the said cutter-heads, hopper, and cut-off saw are mutually adjustable and adjustable with reference to said guide.

4. The method of fabricating wood panels consisting in assembling sticks in continuous courses in lateral and end-abutting relationship, transversely grooving said sticks in said relationship, inserting keys into said grooves, and cutting off the thus fabricated sticks to specified lengths.

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