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SHAKE BOARD RESAWING MACHINE

Filed May 15, 1952

3 Sheets-Sheet 1

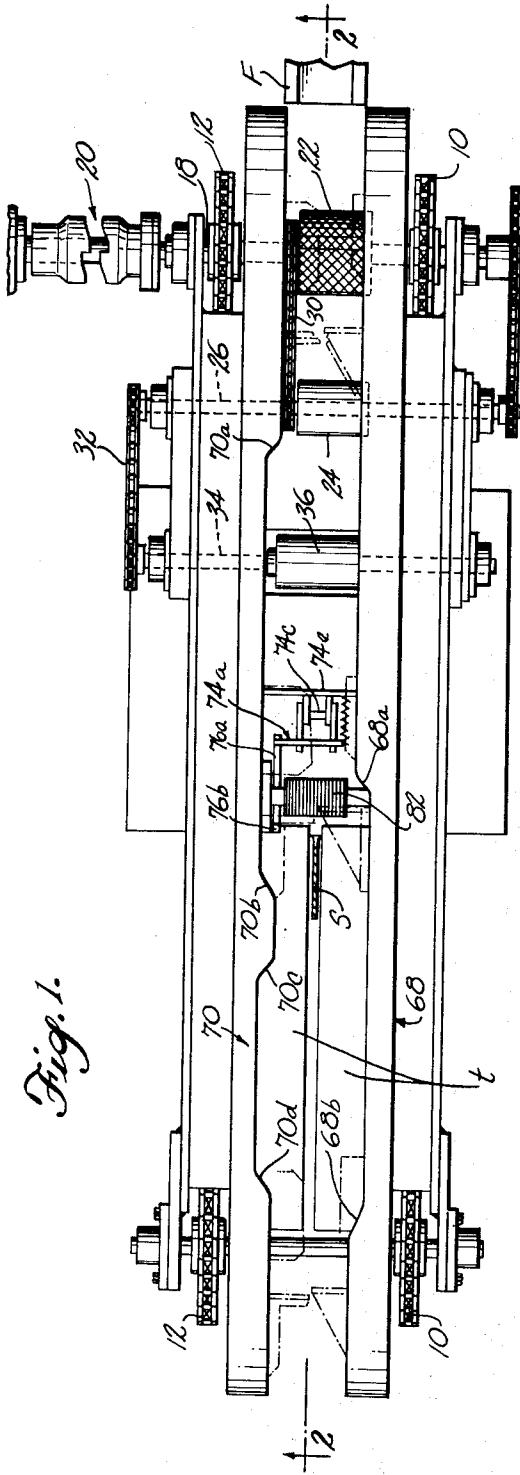


Fig. 1.

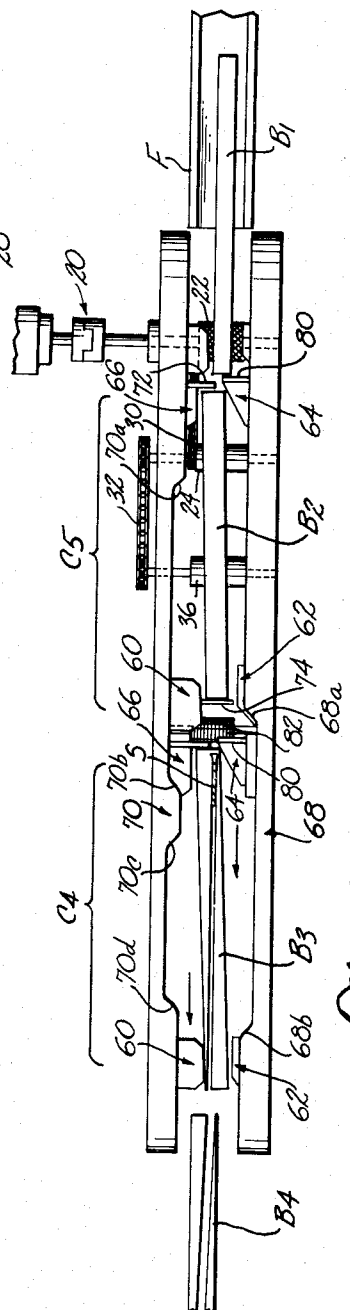


Fig. 3.

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3 Sheets-Sheet 2

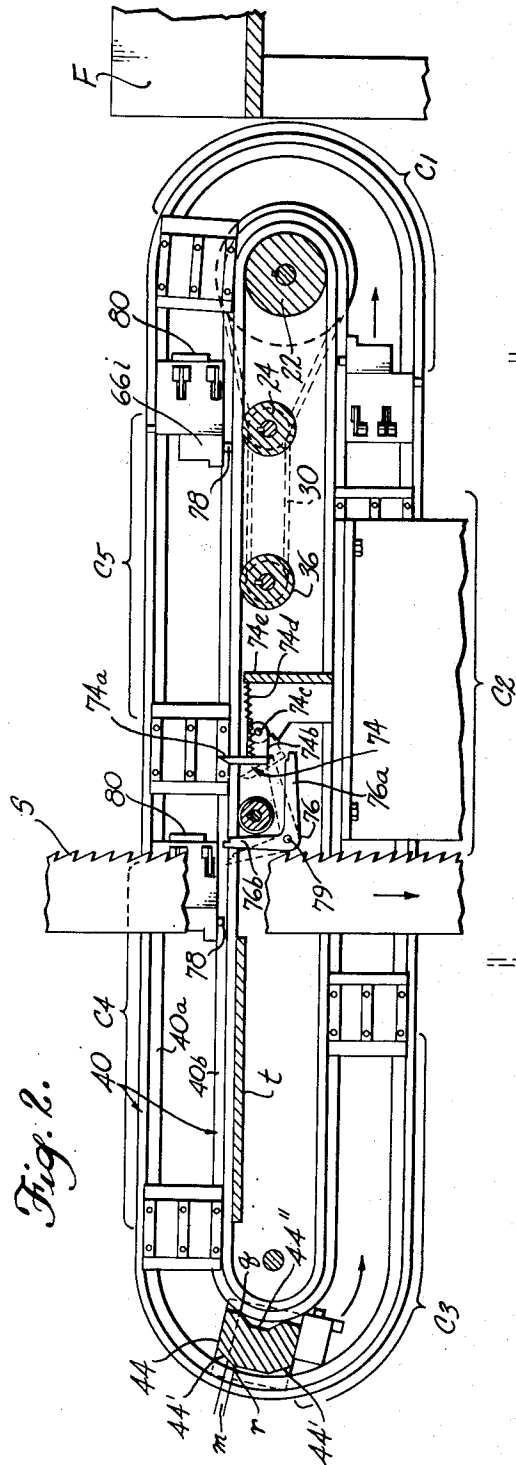


Fig. 2.

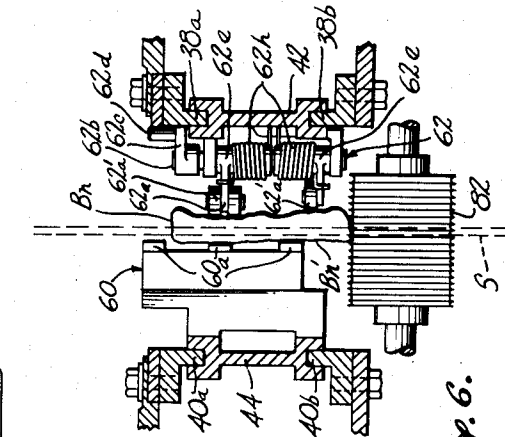


Fig. 6.

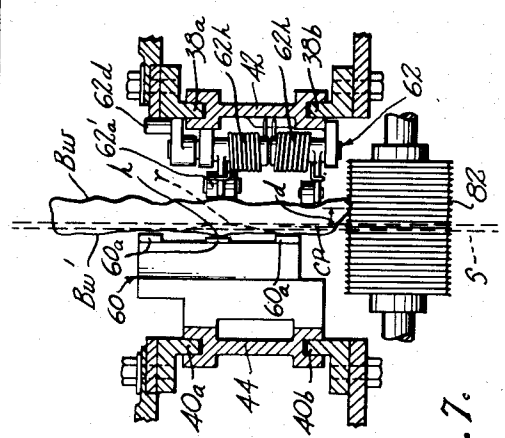


Fig. 7.

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3 Sheets-Sheet 3

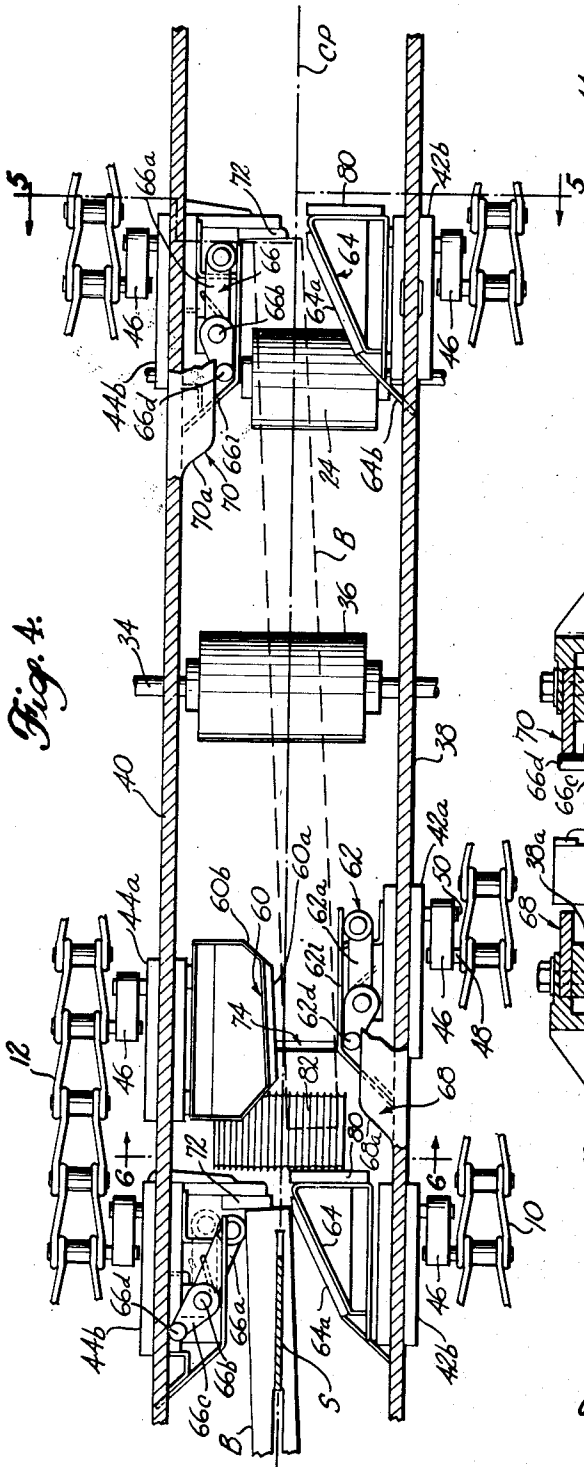


Fig. 4.

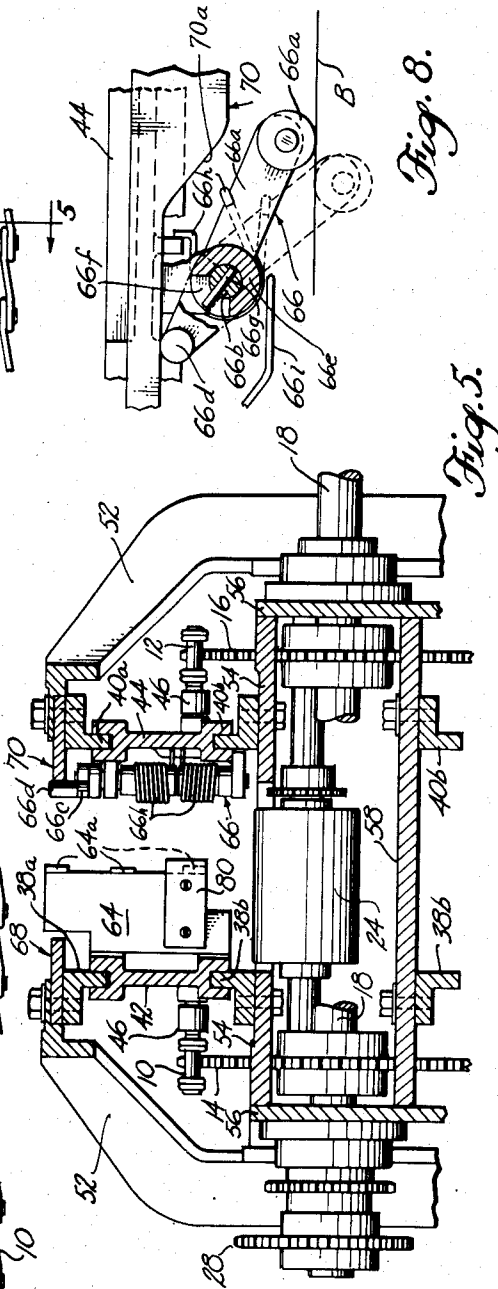


Fig. 8.

Fig. 5.

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2,659,396

SHAKE BOARD RESAWING MACHINE

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Application May 15, 1952, Serial No. 287,936

28 Claims. (Cl. 143—10)

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This invention relates to shake board resawing machines and is more particularly concerned with the manufacture of shakes, split by hand or otherwise, with sawn backs. The invention is herein illustratively described by reference to the preferred form thereof as applied to the manufacture of hand-split shakes of the type mentioned, but it will be appreciated by those skilled in the art that various modifications and changes therein may be made without departing from the underlying features involved as set forth herein-after and defined in the appended claims.

Tapered shakes produced by halving split Red Cedar boards or the like on a bias in a resawing operation constitute a standard commercial product used for roofing and siding applications and are much in demand for their attractive rustic appearance and great durability. Often the cutting of blocks and the splitting of boards for these shakes is carried out by small operators in the field who, because of the easy mobility of their equipment and crews, are enabled to utilize economically otherwise wasted stumpage, preserved fallen logs and stands of timber too small or sparse to be logged economically for regular lumber mills. However, the cost of the final product has been higher in the past than various other types of shingles on a square footage basis. This is largely attributable to the relatively large amount of manual handling involved in processing this product and the absence of specialized production machinery for resawing the split boards.

As will be appreciated by those familiar with the art, it is possible to cut shakes with a definite taper entirely with the use of a froe. This is done by applying the froe alternately to opposite ends of the block for cutting off one shake at a time, it being characteristic of the wood to split with a taper if the layer severed from the block is not thick. It is usually preferred, however, that the back sides of the split shakes be sawn instead of split, as they will then lie flatter and form more weathertight shingling than if both sides are split. In producing this latter type of shingling, herein termed a "split-resawn" shake, nontapered boards split from the block are halved on a bias in a resaw operation to produce two shakes from each board. The preference for this type of shake has not been due to any outstanding economical advantage over the taper-split type in the past, however; in fact, they have tended to cost as much or more because the resawing machines used previously were of a type requiring manual handling and guidance of the shake boards in

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feeding them through the saw; hence involved a high labor cost and gave a relatively low rate of production for the amount of labor and plant overhead expense involved. It has long been evident that a major obstacle to the full commercial development and realization of the potentialities of the split-resawn shake accordingly has been the lack of a resaw machine capable of handling and cutting the split boards efficiently and economically on an automatic or semiautomatic rapid-production basis.

In any such machine, the boards, which are rough and irregular, must be fed through the resaw while held at the proper inclination and offset of their free edges in relation to the plane of the saw. These boards, sawn to length and split largely by manual operations or the like, are necessarily rough and nonuniform; in fact, it is preferred that they be of nonuniform shape and dimensions. For instance, they may vary in thickness approximately from $\frac{3}{4}$ of an inch to $1\frac{3}{4}$ of an inch and in length approximately from 23 inches to 27 inches. The width of the boards may also vary greatly, such as from 3 or 4 inches to 14 or 15 inches, or even greater in typical cases. Moreover, the sides and edges of the boards, being split, will ordinarily be rough or uneven, and sometimes beveled instead of being squared. Also, the boards may tend to bow or possess curvature, either or both lengthwise or transversely, and in varying degrees. Obviously these rough-hewn, approximately parallel-sided boards of varying length, width and thickness cannot be handled, held or sawn by any ordinary or conventional automatic or semiautomatic resawing machinery on a rapid production basis while achieving a reasonable degree of uniformity in their functional shape—that is, tapered from their butts to their tips, with generally squared tips instead of being cut through back of their tips to remove one or both corners.

It is accordingly a general object of the present invention to provide a production resaw machine which will enable split-resawn shakes to be manufactured more rapidly and economically than has heretofore been possible. A further object is a board-holding and feed mechanism for a shake board resaw machine which will automatically position the boards at substantially the correct inclination and offset relative to the cutting plane of the saw regardless of the size, shape or surface configuration of the boards within wide commercially acceptable limits; and further, will rigidly hold the boards in that position during the actual sawing operation despite saw pressure

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tending to tilt or slew the boards and produce a curved cut. While the butt thickness of the resulting shakes will necessarily vary with the thickness of the boards, it is preferred that the tip thickness of the shakes cut in the machine be fairly uniform or constant. The invention provides a means by which the boards are held and fed in a resawing machine so as to produce shakes which on the average are of substantially uniform tip thickness and virtually always acceptably uniform.

A further object of the invention is a compact, rapid-production, automatic shake board resawing machine of rugged and durable form, requiring a minimum amount of floor space and a minimum amount of maintenance and attention in its operation.

With these and other objects in view, as will hereinafter more fully appear, the improved shake board resawing machine in its preferred embodiment comprises a pair of endless feed chains guided in parallel circuitous paths on opposite sides of the cutting plane of the machine. Runner elements, moving in track guides which extend parallel to the chains to define a lineal feed path coincident with the cutting plane of the saw, are connected to the chains and carry cooperative board holder elements. Each board is held by one end between one pair of holder elements and by its opposite end between another pair of holder elements, the two pairs comprising a carriage set, and there being a number of similar carriage sets movable necessarily along the feed path by the chains to feed boards in succession through the saw. A frictional drive conveyor comprising one or more live rolls driven at a peripherally faster rate than the speed of travel of the chains, hence of the board holder elements, advances a board impositively toward the saw until the board is arrested by a yieldable detaining stop automatically projected into the feed path just prior to the board's arrival at the point of detention. Restraining stops are movably connected to a feed chain at respective locations therealong immediately preceding each board carriage set. Each such restraining stop prevents travel of the succeeding board past the detaining stop before the latter is moved into projected position as the board is being advanced on the live rolls toward the saw. The board, while detained by the detaining stop, is next engaged from behind by an advancing pusher gauge movably connected to one of the carrier chains immediately behind the associated carriage set. The pusher gauge advances the board positively toward the saw and forces the detaining stop into retracted position. Thereupon the carriage set holder elements are actuated and effect gripping of the board in cutting position inclined to the plane of the saw.

The holder elements engaging each end of the board comprise a lateral board gauge offset slightly from the cutting plane on one side thereof, and opposing presser means comprising one or more cam-actuated arms pivoted to contact the opposite side of the board and press it against the locating gauge. The lateral board gauge contacting the side of the board near one end is located on the opposite side of the board from the gauge which contacts its opposite end, and the board is initially positioned in the machine by a feed-in operator, manual or automatic, so that its diagonally opposite free edges, i. e. the smoothest edges for locating purposes, are the ones which contact the two lateral gauges.

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Elongated cams, on opposite sides of the feed path, engaged by cam followers actuating the presser arms, have control surfaces thereon which are located along the feed path so as to cause simultaneous actuation of the presser arms for gripping the board in cutting position after engagement thereof by the pusher gauge. The gripping elements hold the board firmly, but because they grip the sides of the board frictionally there might be a tendency for the board to slip lengthwise through them under saw pressure. The pusher gauge not only prevents this, but correctly locates the board lengthwise relative to the gripping elements before the latter are actuated to grip a board.

Further features of the invention reside in the preferred construction of the lateral board gauge and presser arms for positionally gripping irregular boards of the type mentioned. Each lateral board has two spaced-apart board-contacting outer abutments which lie at substantially equal distances from the cutting plane corresponding approximately to the desired thickness of the sawn shake tips. Intermediate these abutments is a third abutment which lies at a somewhat greater distance from the cutting plane. The purpose and advantage of having the intermediate abutment spaced farther from the cutting plane than the first named abutments of the locating gauge, lies in the minimizing of tilt of wide boards, i. e., those which, when supported by a live roll, span fully between the outer abutments, which have outward curvature or a hump on their sides contacting the intermediate abutment. But for the setback of the intermediate abutment this type of irregularity on a wide board could cause considerable tilting or offset of one edge relative to the cutting plane, and result in sawing an oblique-tipped reject shake. On the other hand, a narrow board, i. e., one of a width, when riding on a live roll, insufficient to cause it to span the full distance between the first-named abutments, contacts only the intermediate abutment and the outer abutment adjacent the live roll. This imparts a slight lateral tilt to a narrow board having a substantially flat side pressed against such abutments. The amount of tilt of the narrow board is not sufficient, however, to result in cutting of an oblique tip on the shake. Slight but unobjectionable tilting of narrow boards gripped in cutting position is therefore tolerated for the sake of preventing exaggerated or excessive tilting of wide boards misshapen in the way mentioned.

A further feature of the invention resides in the provision of a board supporting roll extending transversely to the cutting plane at a location adjacent the saw, which roll has sharp peripheral projections thereon which bite into the board under pressure of the saw. These projections prevent lateral skidding or slewing of a board having a beveled edge supported on such guide roll during cutting and subjected to a torque due to the noncoincidence of the cutting plane and the line or point of contact of the board's edge with the roll.

These and other features, objects and advantages of the invention including certain details of construction of the preferred embodiment thereof as herein illustrated will become more fully evident from the following description by reference to the accompanying drawings.

Figure 1 is a plan view of the machine omitting certain parts for clarity of illustration, as adapted for use with a band saw having its cutting

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stretch or side, shown in cross section, disposed vertically.

Figure 2 is a corresponding simplified sectional side elevation view taken on line 2—2 in Figure 1.

Figure 3 (Sheet 1) is a simplified plan view of the machine at further reduced scale illustrating the operation thereof with shake boards at different positions advanced along the feed path which extends through the saw.

Figure 4 (Sheet 3) is an enlarged fragmentary plan view with certain parts broken away or omitted for clarity illustrating various details of construction especially with respect to the board-holding elements and their relationship to the cutting plane.

Figure 5 is a corresponding transverse sectional view taken on line 5—5 in Figure 4.

Figure 6 (Sheet 2) is a partial transverse sectional view taken on line 6—6 in Figure 4, illustrating the action of the gripping elements for holding a relatively narrow shake board in cutting position while being advanced through the saw.

Figure 7 is a similar view wherein a wide shake board of a certain type or shape is being similarly held in cutting position.

Figure 8 (Sheet 3) is a sectional plan view showing details of a presser device mechanism by which the presser arms are projected and retracted relative to the boards.

In its illustrated form, the machine generally comprises board-holding and feed mechanism by which the approximately parallel-sided split shake boards B, delivered to it either manually or by suitable mechanical delivery means F, not illustrated in detail herein, are fed in rapid succession endwise along the cutting plane CP (Figs. 4 and 7) and through the saw. In the example, the saw is a band saw S and for simplicity, only a portion of its cutting stretch or side is illustrated, this being disposed vertically and thereby establishing a vertical cutting plane along which the boards are fed in a substantially horizontal lineal path. In the preferred form of the machine a high rate of production is achieved, with the saw S almost constantly active, by employing a plurality of board-gripping element carriage sets connected in series arrangement to endless carrier members which extend in circuitous paths parallel to and along opposite sides of the cutting plane. At the input end of the machine (right in Figures 1, 2 and 3) boards are placed in the respective carriage sets as each commences its travel, following those preceding it, along the upper chain stretches defining the horizontal feed path. Before reaching the saw, the upright, endwise-advancing board is automatically positioned by the gripping elements to dispose the sides of the board at a horizontal angle to the cutting plane or direction of feed. After passing through the saw the two shakes produced from each of the sawn boards are discharged from the board-gripping elements and the latter are then carried along a return path to their starting position for receiving another board to be resawn.

The carrier members by which the work-gripping elements are moved and guided in elongated circuitous paths comprise, on opposite sides of the cutting plane, the endless chains 10 and 12 driven and guided by pairs of sprockets 14 and 16 located at opposite ends of the machine so as to dispose the chain stretches horizontally between the sprockets. As shown in Figure 4, the chains 10 and 12 are spaced equal distances

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from the vertical cutting plane CP. The chain drive sprockets at the head or input end of the machine are mounted upon horizontal drive shaft 18 having a releasable clutch 20 for applying and removing drive power from the shaft 18 at will. Two short shafts support the respective idler sprockets at the opposite end of the machine.

As the boards B are delivered to the machine by the feed-in device F they are initially supported and conveyed on a longitudinal edge by the knurled live roll 22 and subsequently also by the live roll 24. The roll 24 is keyed to a countershaft 26 driven by sprockets and a chain 28 interconnecting the shafts 26 and 18. The knurled roll 22 rotates freely relative to the drive shaft 18 supporting it and is driven from countershaft 26 at substantially the same peripheral velocity as the roll 24 by means of sprockets and a chain 30 (Figure 1). The shaft 25 is also drivingly connected by sprockets and a chain 32 to a third shaft 34 spaced further along the feed path of boards and upon which the live roll 36 is rotatively supported in position of alignment of its upper surface with the aligned upper surfaces of the two live rolls 22 and 24. The live roll 36, however, is driven at a slower speed than the rolls 22 and 24 and, in fact, at a slower speed peripherally than the speed of the carrier chains 10 and 12, for a reason which will become apparent. The three rolls constitute merely impulsive or frictional-drive conveyor elements which serve special purposes to be described in connection with other features later herein.

Adjacent and parallel to the respective carrier chains 10 and 12 are mounted the circuitous guide tracks 38 and 40 (Fig. 4), each at substantially constant spacing from the associated chain. These are double tracks—that is, they have outer and inner guide rails 38a, 38b and 40a, 40b, respectively (Figs. 5 to 7), between and along which the grooved slide blocks are guided for circuitous movement driven by the chains 10 and 12, blocks 42 along track 38, and blocks 44 along track 40. These slide blocks carry the work-holder elements to be described and the upper sides of the tracks on which they slide establish a substantially constant lineal feed path along the cutting plane. Without such tracks the work-holder elements would be positioned by the carrier chains 10 and 12, hence their paths would tend to vary or change while advancing the boards through the saw, producing non-uniform results in resawing the boards.

Only a portion of the machine frame supporting the various shafts and other functional parts is illustrated, inasmuch as the details thereof are largely of incidental or secondary importance. In Figure 5, for example, the upper or outer guide track rails 38a and 40a are supported in their upper stretches by means of the frame arms 52, whereas the upper stretches of the inner guide rails 38b and 40b are carried by the longitudinally extending frame plates 54. These plates are supported by their outer edges in horizontal position by the vertically disposed longitudinal frame plates 56 serving as supports for the several rotative shafts. In their lower stretches, the inner track rails 38b are carried by the horizontal frame plate 58 interconnecting the vertical plates 56, as shown (Figure 5).

With more specific reference to the slide blocks guided by the tracks 38 and 40, a series of slide blocks 42a, comprising five in number in the example, are positioned at equal spacings around the track 38 and, alternating with the blocks 42a,

a second series of the same number of slightly different slide blocks 42b are likewise positioned at intervals around the track 38. The guide track 40 also has a first series of slide blocks 44a of the same number and at approximately corresponding locations as the blocks 42a on track 38, and a second series of alternate slide blocks 44b approximately similar in number and locations to the slide blocks 42b on track 38. Each of the slide blocks is connected to the respectively adjacent drive chain 10 or 12 by means of an individual draw link 46, the leading end of which is pivotally connected to the chain pin 48 and the lagging end of which is pivotally connected to the slide block projecting pin 50, as shown (Figure 4). The length of each draw link is sufficient to permit slight variations in the spacing between the block pin 50 and chain pin 48 during movement around the path of travel, especially as the block rounds the 180 degree arcuate curves at the ends of the chain stretches. The links necessarily pivot on these pins to accommodate this change of spacing accompanying movement of the slide blocks around these turns. Moreover, such pivoted draw links permit the chain to sag slightly between sprockets without compelling the blocks sliding of the straight sections of guide tracks 38 and 40 to carry the weight of the chains as dead load causing undue pressure and wear on the tracks.

In order to permit the slide blocks, closely guided between the track rails on the straight stretches, to round the turns at the ends of the machine without binding, the blocks are of special form in cross section as indicated at the left in Figure 2. Having slightly chamfered outer face corners 44' and a recess 44'' in the inner face intermediate the ends thereof, the shape or formation is such that the rear point *r* nearest the outer rail is located forward (by any small distance *m*) of the rear point *q* contacting the inner rail. Thus as the slide block enters the turn moving to the left on the upper stretch in Figure 2 the block drops or tilts down about point *q* as a pivot, and the point *r* swings away from the outer rail rather than against it. The block then literally tends to swing or fall freely into the turn instead of hanging up at its entrance. Theoretically this action would obtain if the dimension *m* were zero but freedom from binding is definitely assured only by having this dimension of appreciable value.

In general, there are two pairs, a leading and a lagging pair, of gripping elements which make up a carriage set for holding a board in cutting position while advancing it toward and through the saw *S*, and these elements are carried by individual slide blocks guided by either of tracks 38 or 40 as the case may be. The pairs of gripping elements of each carriage set are spaced apart in their line of advance by a distance which permits them to engage the board side faces adjacent the respective ends thereof. Each such pair of gripping elements comprises a lateral board gauge having board contacting abutments thereon at fixed spacing from the cutting plane CP, and a cooperating presser device by which the board is pressed laterally against such gauge to establish the board's cutting position. While the presser means of the leading and lagging pairs of gripping elements comprising a carriage are quite similar in form, the lateral board gauges thereof, while adhering to a common principle of construction, differ somewhat as to detail. Located on opposite sides of the cutting

plane, the lateral board gauges are adapted to bear against the diagonally opposite free edges of the split boards in a manner described herein-after.

There are five similar board carriage sets of gripping elements in the example, corresponding to the groups of slide blocks carrying such elements. The spaces along the circuitous path of travel occupied by these carriage sets are designated C1, C2, C3, C4 and C5 in Figure 2. More specifically, the leading pair of gripping elements of one set comprises the lateral board gauge 60 and the cooperating presser means 62, while the lagging pair of gripping elements in the same set comprises the lateral board gauge 64 and the cooperating presser means 66, the four elements in the order named being carried, respectively, by the slide blocks 44a, 42a, 42b and 44b (Figure 4).

The lateral board gauge 60, of suitable form to serve its intended purpose when secured upon the inner side of the slide block 44a, has three projecting horizontal abutment strips 60a comprising its inner or board-contacting face. These strips, of appreciable length extending generally along the feed path at close spacing to the cutting plane CP, are actually placed at a slight horizontal angle to the cutting plane so as to converge slightly therewith in the direction of feed, namely to the left in Figure 4. Except near their trailing edges, which are only slightly inclined, if at all, to the cutting plane, so that board edges pressed laterally thereagainst do not tend to slide forwardly, abutment strips 64a of lateral board gauge 64 converge rearwardly relative to the cutting plane at a much greater angle than abutments 60a. Thus the trailing or board contacting portions of abutment strips 64a lie closely adjacent the cutting plane whereas their leading edges do not. The vertical spacing between the three abutments 60a of gauge 60 is the same as that of the somewhat similar abutment strips 64a of the gauge 64, as shown in Figure 5.

With reference to the latter figure, it will be noted that the lowermost of the three abutments 64a (hence of 60a also) will be typically located approximately one and one-half to two inches above the lower edge of a board supported on the live rolls, whereas the uppermost of the three abutments in either case will be located approximately six to seven inches above such lower edge. The intermediate abutment in each case is located approximately midway between the other two. The thickness of the upper and lower two abutments transversely to the cutting plane is approximately $\frac{1}{8}$ of an inch greater than that of the intermediate abutment element—that is, the former project approximately $\frac{1}{8}$ of an inch nearer to the cutting plane than the intermediate abutment. The significance of this difference of spacing will be described subsequently with reference to Figures 6 and 7 herein. These abutment strips are preferably formed of a material such as Micarta or a like frictional material having good wearing qualities when put to the use disclosed.

The presser means (62 and 66) of the two pairs of board-gripping elements comprising a carriage set are substantially the same in construction and operate similarly. Referring to the presser means 66, for example, as shown in Figs. 4, 5 and 8, the upright rocker shaft 66b carried by the slide block 44b serves as a pivotal support for the horizontally actuated presser arms 66a, there being an upper arm substantially opposite

the intermediate abutment element 64a, and a lower arm located somewhat lower than the lowermost of the three abutments 64a. The upper arm carries on its swinging end two contact pads, comprising rubber rolls 65a', while the lower arm carries a single such roller. A crank arm 66c fixed upon the upper end of the rocker shaft 66b carries a cam follower 66d upon its swinging end. This crank arm may be swung from a position generally transverse to the cutting plane CP into substantial parallel relationship therewith. The two presser arms 66e are independently rotatively supported on the shaft 66b by means of the cylindrical sleeves 66z and, as shown in Figure 8, these sleeves are provided with circumferential slots 66f therein. Stop pins 66g secured to the shaft 66b are received in these slots and cause the sleeves to rotate therewith only when the pins abut the slot ends. In the normal (retracted) position of the presser arms such engagement exists, being caused by positioning of crank arm generally parallel to the cutting plane. Subject to this action of the crank arm, the separate coil springs 66h encircling the respective sleeves apply force to the presser arms urging them toward the adjacent side of the board.

The initial position of the presser arms as the boards are first delivered to the machine into the space defined between the gripping elements of a carriage set is the retracted position thereof, so that the boards will be received freely between the opposing pairs of gripping elements. However, the retracted spacing between the respective gripping elements is sufficiently close to prevent the board tipping over very far to either side while it is being advanced, on edge, upon the live rolls 22 and 24 during the initial phase of its travel toward the saw. Before the board reaches the location of the saw S, the presser arms 66a of the presser device 66 and the corresponding and similar arms 62a of the presser device 62 are released by deflection of their crank arms in order to permit the springs in these devices to apply force through the presser arms to the board and hold the board firmly in cutting position against the lateral gauges 64 and 64', respectively. This action occurs substantially simultaneously in the devices 62 and 64, so that both ends of the boards will be swung into correct position at the same time. It is effected by the elongated track cams 68 and 70 secured along the outer guide track rails 38a and 40a, respectively. Such cams have inclined steps or control surfaces 68x and 70a thereon which permit the cam follower pins 68d and 70d to swing simultaneously away from the cutting plane as the slide blocks carrying them approach the saw location.

As will be noted in Figure 4, the lateral gauge 69 is located on the opposite side of the board from the lateral gauge 64 to engage the free edges of a board. The pusher gauge 72 carried by the slide block 42b immediately behind the lateral gauge 64 projects therefrom transversely in relation to the cutting plane and engages the trailing end of a board to position such end adjacent the trailing end of the abutments 64a. The board's leading end then lies against the abutments 64a. Actuation of the associated presser arms presses the board's free edges against such abutments and disposes the board at an incline to the cutting plane as desired.

In order to insure that the board will be correctly positioned with its trailing end against

the pusher gauge 72 before the presser arms are actuated for spring operation and the board is clamped firmly in place between the gripping elements, a yieldable detaining stop 74 (Figs. 2 and 4) is provided at a fixed location somewhat ahead of the saw. This detaining stop is projected into the path of a board being rapidly advanced on the live rolls 22 and 24, so as to arrest movement of the board for a short period of time. The board is thus held stationary against the continual impositive driving force of the friction rolls until the pusher gauge 72 of the slower moving carriage set comes up from behind and engages the board's trailing end. The board is then advanced positively a short distance, pushing down the yieldable stop 74, before the cam follower pins 68d and 70d ride outwardly on the cam surfaces 70a and 68a, respectively, to effect gripping of the board in the holder elements.

In order to achieve this type of action, the detaining stop 74 comprises the retractable stop abutment element 74a which is carried on an arm 74b pivoted on a transverse horizontal shaft 74c in order to swing such stop element into and from the feed path of boards. A spring 74d interconnecting the end of the arm 74b and a fixed support 74e on the machine frame is so located that its line of force crosses over the pivot axis during the process of swinging the stop element 74a between its projected position in Figure 2 and its retracted position shown by dotted lines in the same figure. Thus the spring holds the stop yieldably in projected position, whereas it also holds the stop in retracted position until raised positively, as by counterclockwise swinging of the actuating arm 76a. This actuating arm comprises part of a bell crank 76 which is pivoted on a transverse horizontal shaft 79. A bell crank control arm 76b normally projects into the path of advance of an abutment element 78 carried by one of the leading slide blocks of the carriage set. When this abutment engages the upper end of the control arm, the latter is swung progressively counterclockwise by continuing advance of the carriage mechanism, and the swinging end of the actuating arm 76a then raises the detaining stop 74 into projected position. This is timed to occur immediately before the leading end of the advancing board reaches the detaining stop. Because of the finite length of the abutment 78 engaging the end of the control arm 76b, there is a short but appreciable period during which the actuating arm 76a is pressing or holding the stop 74 positively in its projected position. This period of time is sufficiently long that the board's momentum is absorbed by the stop before the actuating arm drops down. There is no chance, therefore, that the board's initial import on the stop can force it back down and allow the board to escape past it at that time.

In order to establish positional synchronization or timing between the positive holding period of the detaining stop and the instant of impact thereon of the board, a board-restraining stop 80 is carried by the traveling slide block 42b of the next preceding carriage set and projects transversely with relation to the cutting plane. This restraining stop is overtaken by a board on the rapidly driven live rolls 22 and 24, and retains the board so that it is traveling in definite position relative to the associated carriage set when it approaches and finally reaches the location of the detaining stop 74. The remaining problem in timing is then simply a matter of

locating the abutment 18 on the associated slide block or runner so as to actuate the detaining stop 14 just prior to the instant of arrival of the board at the stop. With correct timing thus established, the period of holding the stop 14 positively in projected portion may be made very short, so that almost immediately after impact of the board thereon, the ensuing impact of the board's trailing end by the pusher gauge may be caused to occur and the board's advance continued without wasting time. Resumption of a board's movement effected by the pusher gauge 72 occurs sooner, of course, with a long board than with a shorter one.

The basic purpose of live roll 36, driven at a somewhat slower rate than the feed rate of the board-gripping elements, is to provide a support for a board being advanced by the rapidly driven rolls 22 and 24 which support does not greatly hinder or retard the initial rapid advance of the board to keep it ahead of the rear gripping elements 64 and 66 of the associated carriage set moving upwardly into the straight feed stretch. The reason roll 36 is driven slower than the carrier chains, however, is to apply retarding force on a board and hold it back against the pusher gauge during the short interval between contact of the pusher gauge therewith and subsequent actuation of the board gripping elements by cam follower pins 66d and 62d reaching the cam control surfaces 70a and 68a to secure the board firmly against any possible longitudinal shifting out of position before reaching the saw. Reversely inclined control cam surface 68b (Figure 1) is located beyond the saw to release the board's leading end from the leading gripping element pair 60 and 62, before they enter the downward turn in the track. Control surface 70b releases the board's trailing end from pressure of arms 66a just before the board is sawn through (dotted line position at left in Figure 4), in order to spare the saw from lateral pressure when the board halves are severed from each other. However, the arms 66a are recammed into holding position after sawing is completed and the board parts are beyond the saw in order to hold them on the saw table *t* and prevent their dropping down between the tracks as soon as their centers of gravity pass the end of the table. This allows picking up or removing the boards more conveniently from the machine than otherwise. Such recamming is affected by cam surface 70c. A subsequently engaged cam surface 70d effects release of the boards from elements 64 and 66 before they enter the curve in the tracks at the discharge end of the machine.

The several work-holding elements have suitable inclined guide surfaces which minimize the possibility of a board, especially a relatively short one, becoming caught thereon and failing to become seated properly therebetween in order to be gripped in cutting position when the time comes. For example, the lateral gauge 64 has the abutment strips 64a inclined at an appreciable angle to the cutting plane CP which tend to guide the trailing end of a board into engagement with the pusher gauge 72. A flat plate 64b extending forwardly and outwardly from the leading ends of the abutment strips 64a at a greater inclination to the lateral location of the guide track 38 affords supplementary guidance to the same end, as does the guide plate 66i on the opposing presser device (Figures 2 and 4), such plate having slots therein permitting the presser arms 66a to be retracted behind such

plate where they will not interfere with the action thereof in guiding the end of a board into contact with the pusher gauge 72 as the latter moves forward relative to the board. A guide face 60b inclined to the cutting plane is provided on the rear inner corner of the lateral gauge 60 in order to facilitate the insertion of boards into the space between it and the opposing guide plate 62i of the coating presser device. Normally, however, the boards will be placed in the machine with their end portions located generally between the proper holding elements of a carriage set so that the chances of the board becoming caught out of proper position are small.

Adjacent the saw along the feed path is a supporting roll 82, the upper side of which is in line with the upper sides of the preceding rolls 36, 24 and 22. The roll 82 supports the lower edge of the board against downward pressure of the saw S as the board is actually being sawn. Preferably the surface of this roll is provided with a series of sharp circumferentially extending ribs or knife edges, formed as by grooving the roll circumferentially at close intervals along its length, so that when the saw pressure forces the board downward against the roll these sharp annular projections bite into the wood. The roll is suitably journaled against displacement under endwise thrust, and by biting into the wood prevents the lower edge of the board from sliding transversely to the cutting plane and causing it to tilt under saw pressure should there be a tendency to do so as a result of the lower edge of the board being beveled or uneven and the line of contact between the board and the roll being offset from the cutting plane. The action is illustrated in connection with Figure 7. In that figure the board has a beveled lower edge which actually contacts the supporting roll 82 at an appreciable lateral distance *d* from the cutting plane CP, hence the application of saw pressure to the board tends to tilt the board laterally in a counterclockwise sense about the point of contact on the roll 82. As a corollary the lower edge of the board tends to be slid to the right along the roll 82 causing outward yielding of the lower presser arms 62a and thereby causing a curved cut in the board. The serrations on the presser roll 82 bite into the wood and assist the lower presser arm to hold the lower portion of the board against the lower lateral abutment 60a so that saw pressure cannot displace the board as it is being cut. In the illustration of Figure 6 the lower edge of the board is not entirely squared with relation to the sides but the line of contact thereof with the serrated roll 82 is substantially coincident with the cutting plane of the saw. Hence the saw pressure exerted downward in the cutting plane is stably resisted, as if the edge were squared, and there is little or no tendency for saw pressure to tilt or slew the board to one side or the other. The sharp projections on the roll 82 preventing lateral sliding of a board edge thereon are preferably formed as circumferential or angular knife edges; however it will be evident that continuous edges are not essential since a series of points or like forms will accomplish a similar result. The term "annular" applied to these projections is intended to embrace the various equivalent forms thereof.

Figures 6 and 7 particularly illustrate certain aspects concerning the operation of the board-gripping elements. In Figure 6 the end portion of a "narrow" board B7 is being gripped between

the lateral board gauge 60 and the coating presser device 62 comprising the upper and lower presser arms 62a. The board has been placed in the machine so that its free edge, i. e., its smoothest edge Bn' faces against the lateral gauge 60, leaving the comparatively rough opposite edge to be engaged by the rubber rollers 62a'. In this figure the free edge Bn' is fairly smooth and the board is sufficiently narrow that its upper edge fails to reach the upper of the three abutments 60a, hence contacts only the intermediate abutment and the lower abutment. The upper and lower presser arms 66a, being independently mounted and spring-actuated, apply gripping force to the side of the board, pressing it firmly against these abutments despite any difference in board thickness at the locations of contact of the presser rolls 62a' carried by the respective arms. Because the lower contacted abutment lies closer to the cutting plane than the intermediate contacted abutment, this narrow board will therefore be inclined slightly from the vertical so that the tip of the shake being cut in the saw will be slightly thinner near the lower longitudinal edge of the board than it will be near the upper longitudinal edge thereof. However, because the board is narrow this difference is slight and ordinarily will not be noticeable, especially in view of the roughness of the board on its opposite side.

In Figure 7 the board Bw comprises a relatively "wide" board which is of a sufficient width vertically to more than span the distance between the supporting roll 52 and the uppermost abutment element 60a. In this case, however, the board near its free edge Bw' instead of being fairly smooth as in the case of the board Bn in Figure 6, happens to have a hump or projection h which contacts the intermediate of the abutments 60a. Because the intermediate abutment is spaced farther from the cutting plane than the lower abutment, however, the hump h does not cause tilting of the board greatly if at all away from the vertical. In other words, despite the considerable width of the board tending to multiply in terms of tilt any irregularities of the contact face thereof engaging the abutments 60a the board's upper edge is not displaced far from the desired cutting position by the hump h, because of the setback of the intermediate abutment 60a. The same is true of the action of abutments 64a. In effect, therefore, the gripping device deliberately tilts a narrow board slightly in relation to the vertical cutting plane as in Figure 6 so as to minimize the much greater tendency for undesirable offset of the upper edge of a wide board having a hump or convex portion in contact with the intermediate abutments. If instead of having a hump h the same board has a recess r intermediate its upper and lower edges, the intermediate abutment will not be contacted at all and the board will be supported substantially vertically, pressed against only the upper and lower abutments.

With reference to Figure 4, it will now be apparent that the abutments 60a should be inclined at a comparatively small angle to the cutting plane CP in the direction of feed. This angle approximates the desired horizontal angle between the cutting plane and the board inclined thereto in cutting position. Thus while the shake boards may actually vary one or more inches in length, for example, so that the points of contact of their leading free edges with the abutments 60a will vary along the length of the

abutments the tip thickness of the sawn shakes will not vary appreciably.

The reason for having the abutments 64a at a much greater inclination angle with relation to the cutting plane is primarily to improve the guidance of the trailing edges of boards into contact with the pusher gauge 72, and the reason for a small inclination angle applied to the abutments 60a does not apply in the case of the abutments 64a. This is true because the lagging free edge of a board, being located by the pusher gauge, always contacts the abutments 64a at substantially the same place, assuming, of course, that the end of the board is substantially squared.

Operation

With the clutch 29 engaged, the live rolls 22 and 23 are rotated at a peripheral speed somewhat higher than the lineal speed of the carriage chains 10 and 12 and the live roll 38 is rotated at a peripheral speed somewhat lower than such chain speed. The board carriage set of working elements, designated C1 in Figure 2, is shown moving counterclockwise around the turn at the input end of the machine and the presser devices 62 and 66 of such set are then held in retracted position by the control cams 63 and 70. A board B1 (Figure 3) from the delivery device F' may then be freely inserted on edge into the space between the separated gripping elements. Contact of the generally upright board's lower edge with the knurled live roll 22 drags the board along the feed path toward the saw and causes its leading end to overtake and press against the traveling restraining stop 30 located just ahead of the carriage set C1.

The board B2 in the carriage set C5 immediately preceding the board B1 has been advanced farther along the feed path by operation of the live rolls and is being detained by contact of its leading end with the detaining stop 74. In order to arrest board B2 being advanced on the live rolls as indicated, the detaining stop 74 had just previously been actuated into its projected position by engagement between control arm 76b and the traveling abutment 73 carried by a trailing slide block 30 of the next preceding carriage set C4. Timing of the actuation of the detaining stop into projected position so as to hold the stop positively in that position until the board's momentum is absorbed upon impact with such stop is assured by contact of the board's leading end up to that instant with the restraining stop 20 carried slightly behind the preceding carriage set C4.

In the indicated position of carriage set C5 relative to the associated board B2, the pusher gauge 72 of this carriage set is moving up behind the board B2 and about to contact its trailing end. When that happens the board will be pushed further towards the saw in positive fashion, forcing down the detaining stop 74. Continued movement of the carriage set C5 and board B2 toward the saw produces actuation of the presser devices of such carriage set by reason of the cam followers 62d and 66d shifting laterally outward along the inclined cam control surfaces 68a and 70a, respectively (Figure 4). The board is then gripped at the proper horizontal angle to the cutting plane with its sides vertical, as indicated by the position of the board B3 in Figure 3. The board B3 in carriage set C4, however, has been nearly sawn through and is or has been released by cam surface 70b

from associated grippers 64 and is about to be released from grippers 60, 62, by cam surface 68b. The grippers 64 and 66 are subsequently actuated by cam surface 70c for holding the board B3 on the table t after sawing, but are later again deactuated by cam surface 70d to release the board finally for removal.

During the course of sawing the board B3 its lower edge is forced downward by saw pressure against the serrated supporting roll 82 which assists in holding the board against lateral slewing or shifting as a result of saw pressure when the board's lower edge does not contact the roll 82 directly in the cutting plane as previously described.

Upon completion of the sawing operation, the two split-resawn shakes produced from a board will emerge from the discharge end of the machine released from the associated gripping elements as have been the shakes sawn from the board B4 at the left in Figure 3. The gripping elements of the associated carriage set then return to the starting position along the lower path of the drive chains to receive another shake board for sawing.

The operation constitutes an endless feeding of shake boards in close succession through the saw S, as desired.

We claim as our invention:

1. In a shake board resawing machine, board positioning and feed mechanism operable to advance a shake board generally endwise progressively toward and through the saw location with the board in cutting position disposed at an incline relative to the cutting plane in the direction of feed, said mechanism comprising a set of work-holding elements including opposed normally separated board-gripping members disposed on opposite sides of the cutting plane and operable for gripping a shake board in cutting position therebetween, carrier means driven for moving said gripping members conjointly along a feed path parallel to the cutting plane toward and through the saw's location for cutting the board held between said gripping members, a pusher gauge connected to and movable with said carrier means behind said gripping members for engaging and pushing the board positively along the feed path by the rear edge of such board held in cutting position between said gripping members, frictional drive conveyor means disposed and operable for advancing a board impositively in the direction of feed ahead of the pusher gauge, means for driving said conveyor means at a faster rate than said carrier means, yieldable detaining stop means stationarily positioned ahead of the saw in the path of feed to arrest a board being advanced impositively by said frictional drive conveyor means, whereby the board is overtaken by the pusher gauge for positive, further advancement thereof located between said gripping members causing yielding of said stop means, and gripping member actuating means including a first control element located effectively beyond the detaining stop and in advance of the saw location along the feed path operatively for actuating said gripping members to grip the board in cutting position therebetween following engagement of such board by said pusher gauge, said actuating means further including a second control element located beyond the saw location operable for deactuation of the gripping members to release the board after sawing thereof.

2. The shake board resawing machine defined

in claim 1, and a traveling restraining stop connected to and movable with the carrier means preceding the gripping members and disposed in the path of feed of the board on the conveyor means, said restraining stop thereby engaging the leading end of a board being impositively advanced by the conveyor means and limiting the outdistancing travel of the board relative to the pusher gauge prior to the board's arrest by the detaining stop means.

3. The shake board resawing machine defined in claim 2, and means releasably holding the detaining stop normally retracted out of the feed path, and stop-projecting means actuated by movement of the gripping members approaching the location of said detaining stop for projecting said detaining stop into the feed path of the board.

4. The shake board resawing machine defined in claim 3, wherein the stop-projecting means comprises a traveling abutment movably connected to the carrier means for advancing generally along the feed path with the gripping members, and the stop-projecting means includes a member actuatable to hold the stop in projected position positively and a contact element engaged by said traveling abutment during such advancement for actuating said member, said traveling abutment and cooperative contact element having mutually contacting surfaces formed for prolonged engagement during such advancement for maintaining the detaining stop in projected position positively for a period sufficient to absorb the momentum of the advancing shake board impacting thereon.

5. The shake board resawing machine defined in claim 4, and a live friction roll driven slower than the carrier means and thereby maintaining the board against the pusher gauge engaging such board.

6. The shake board resawing machine defined in claim 3, wherein the set of work-holding elements comprises two pairs of board-gripping members spaced apart in the direction of feed for gripping a shake board by its broad side faces near opposite ends thereof, respectively, the members of one such pair comprising a lateral board gauge fixed in parallel relation to the cutting plane on one side thereof, and normally retracted presser means disposed in the opposite side of said cutting plane and actuatable for movement alternatively toward and from the lateral board gauge to press the shake board firmly thereagainst, as with one free edge of the board contacting said gauge, and to release the board from such pressure, and the members of the other pair of board-gripping members comprising a second lateral board gauge disposed in fixed parallel relation to the cutting plane on the opposite side thereof from the first lateral board gauge, and normally retracted presser means opposed to said second lateral board gauge and actuatable for movement toward and from the same to press the shake board firmly thereagainst, as with the opposite free edge of the board contacting said gauge, and to release the board from such pressure.

7. The shake board resawing machine defined in claim 6, wherein the respective presser means have actuating cam follower elements operatively connected thereto for moving the presser means toward and from the board sides, and the control elements for actuating the gripping members are comprised of track cams engaged by said cam follower elements, respectively, and extending generally parallel to the direction of

feed on opposite sides of the cutting plane, said track cams individually having first and second cam follower deflecting control surfaces thereon at respective locations along the feed path effecting substantially simultaneous action of the two presser means following engagement of the board by the pusher gauge, and effecting substantially simultaneous retraction of the two presser means from the board after sawing thereof.

8. The shake board resawing machine defined in claim 7, and spring means interposed between the cam follower elements and the presser means associated therewith for transmitting actuating force to the latter and thereby establishing gripping pressure on boards of different thickness.

9. The shake board resawing machine defined in claim 7, wherein the individual presser means comprise a rocker shaft extending transversely to the line of feed movement, a plurality of presser arms, first pivot means on said shaft including separate elements supporting the respective arms for independent swinging on said shaft, second pivot means on said shaft pivotally supporting the associated cam follower element for swinging thereon, coupling means interengaging said first and second pivot means for effecting simultaneous retraction of said presser arms by movement of said cam follower element in one sense, and separate coupling spring means interposed between said second pivot means and the respective elements of the first pivot means for transmitting force to said arms swinging them against the board by reverse movement of said cam follower element, whereby pressure of the individual arms against the board is established independently of thickness variations or curvature and irregularities of the adjacent side of the board contacted by said arms.

10. The shake board resawing machine defined in claim 9, wherein the lateral board gauges individually comprise board-contacting abutment elements spaced apart widthwise of the board and spaced substantially equal distances from the cutting plane corresponding approximately to the desired tip thickness of the resawn shakes, and an intermediate abutment element located between said spaced-apart abutment elements and spaced at an appreciably greater distance than the latter from such cutting plane.

11. The shake board resawing machine defined in claim 6, wherein the lateral board gauges individually comprise board-contacting abutment elements spaced apart widthwise of the board and spaced substantially equal distances from the cutting plane corresponding approximately to the desired tip thickness of the resawn shakes, and an intermediate abutment element located between said spaced-apart abutment elements and spaced at an appreciably greater distance than the latter from such cutting plane.

12. The shake board resawing machine defined in claim 11, and a board guide roll extending transversely to the cutting plane adjacent the saw location to support the board against saw pressure during cutting, said guide roll having sharp annular peripheral projections thereon biting into the board's edge, preventing lateral skidding or slewing of a board with a beveled edge contacting said guide roll.

13. The shake board resawing machine defined in claim 6, and a board guide roll extending transversely to the cutting plane adjacent the saw location to support the board against saw pressure during cutting, said guide roll having sharp annular peripheral projections thereon

biting into the board's edge, preventing lateral skidding or slewing of a board with a beveled edge contacting said guide roll.

14. The shake board resawing machine defined in claim 1, wherein the conveyor means comprises a series of board-advancing live rolls positioned at intervals along the feed path to engage and advance a board along such path toward the saw, and a board-supporting guide roll located immediately ahead of the saw with its axis transverse to the cutting plane, said guide roll supporting the board against saw pressure during cutting and having sharp annular projections on the periphery thereof biting into the board's edge under such pressure, preventing lateral skidding or slewing of the board with a beveled edge contacting said guide roll.

15. In a shake board resawing machine, board positioning and feed mechanism operable to advance shake boards in successive order generally endwise along a feed path progressively toward and through the saw with the boards positioned for cutting at an incline relative to the cutting plane in the direction of feed, said mechanism comprising a pair of endless carrier chains, means moving said chains in circuitous paths including parallel feed path stretches extending along opposite sides of the cutting plane, circuitous guide tracks extending along each chain and defining a lineal board feed path therebetween coinciding with the cutting plane, an even numbered plurality of runner elements for each chain, guided on said tracks and connected to and movable with the respective chains in sets of two at intervals along the lengths thereof, the runner elements of each set being spaced apart from each other along said tracks by approximately the length of a shake board and those on one chain being located in corresponding opposite positioning to those on the other chain to form coacting carriage sets each for supporting and advancing a single board therebetween, lateral board gauges carried by every other runner element on each chain in alternate arrangement to lateral board gauges carried by every other runner element of the other chain, said lateral board gauges of each carriage set having contact surfaces adapted for engaging the respective opposite froe edges of boards to locate the same in fixed adjacent position relative to the cutting plane in the cutting position of such boards, normally retracted presser elements carried by the remaining runner elements of the respective chains and laterally actuatable for pressing the boards in cutting position against the contact surfaces of said lateral board gauges, elongated stationary track cams extending along the board feed path stretches, and cam follower means guided on said track cams and movably connected to the presser elements for actuation and deactuation thereof, said cams having control discontinuity surfaces thereon located along the board feed path at respective positionings for actuating the presser elements of each carriage set automatically by approach thereof along the feed path to the saw location and for deactuating such presser elements by movement thereof beyond the saw location, respectively.

16. The shake board resawing machine defined in claim 15, and frictional-drive conveyor means extending along the lineal board feed path defined by the guide tracks in position to frictionally engage and advance a board along the feed path, means for driving said conveyor means at a faster rate than said chains, yield-

able detaining stop means stationarily positioned along the feed path to engage and arrest a board being advanced by said conveyor means, and pusher gauges disposed in the board feed path and connected to and movable with one of the chains at locations therealong closely behind the rearmost or trailing board gauges of the respective carriage sets for advancing therewith and engaging the trailing end of a board being arrested by said detaining stop, thereby to continue the boards advance positively, causing yielding of said detaining stop.

17. In a shake board resawing machine, means to feed boards generally endwise in succession along the cutting plane and through the saw location, comprising an endless carrier member, means disposed on one side of the cutting plane for driving and guiding said carrier member around a circuitous path having one substantially straight feed stretch extending parallel to the cutting plane, a plurality of board holder element sets connected to and movable with said carrier member at spaced locations along the length thereof for feeding boards successively through the saw, one holder element of each set having a board contacting surface thereon facing toward and spaced from the cutting plane for locating one froe edge of a board at approximately the resawn shake's tip thickness from the cutting plane, and the other holder element of each set being laterally movable toward and from the board to press against the adjacent side thereof and release the same from such pressure, alternatively, board positioning means cooperating with said holder element sets for inclining the respective boards associated therewith relative to the cutting plane to be sawn on a bias, said positioning means comprising a laterally movable presser element disposed on the opposite side of the cutting plane from the first holder element of a set in process of advancing a board through the saw, means actuating said laterally movable presser element to press one froe edge of such board firmly against the contact face of such first holder element, and a laterally fixed locating gauge contacted by the opposite froe edge of such board, spaced from the cutting plane by approximately the resawn shake's tip thickness generally opposite the movable holder element of said moving set, and means actuating said movable holder element for pressing said board by its latter froe edge against said gauge accompanying such advance of the board through the saw.

18. The shake board resawing machine defined in claim 17, and board locating gauges movedly connected to the endless carrier member adjacent corresponding end elements of the respective holder element sets, said locating gauges projecting transversely to the cutting plane for engaging one end of the individual boards being advanced along the feed stretch toward the saw.

19. The shake board resawing machine defined in claim 17, and board conveyor means frictionally engaging and advancing the individual boards along the feed path toward the saw location impositively, means for driving said conveyor means at a faster rate than the movement of the endless carrier member, and restraining stops connected to and movable with the endless carrier member beyond the leading elements of the respective holder element sets, said restraining stops projecting transversely to the cutting plane for engaging the leading ends of the individual boards being advanced along

the feed path toward the saw and thereby preventing such boards from advancing past the respectively adjacent holder element sets on the approach to the saw.

20. The shake board resawing machine defined in claim 17, and board conveyor means frictionally engaging and advancing the individual boards along the feed path toward the saw location impositively, means for driving said conveyor means at a faster rate than the movement of the endless carrier member, and restraining stops connected to and movable with the endless carrier member beyond the leading elements of the respective holder element sets, said restraining stops projecting transversely to the cutting plane for engaging the leading ends of the individual boards being advanced along the feed path toward the saw and thereby preventing such boards from advancing past the respectively adjacent holder element sets on the approach to the saw, a yieldable detaining stop located adjacent the path of boards approaching the saw and projected into such path to detain a board against the impositive advancing force of said frictional conveyor means, and pusher gauges connected to and movable with the endless carrier member to project transversely to the cutting plane at locations along said carrier member adjacent the trailing end elements of the respective holder element sets and thereby engaging and positively advancing the boards by their trailing ends toward the saw overpowering said detaining stop.

21. The shake board resawing machine defined in claim 20, wherein the means actuating the presser element and the laterally movable holder element comprise cam means having guide surfaces extending generally parallel to the cutting plane along the feed path, cam follower means guided on said guide surfaces and operatively connected to such presser element and holder element for actuation and deactuation thereof toward and from the cooperative holder element and locating gauge, respectively, thereby to grip and release a board disposed therebetween, said cam means guide surfaces having a holder element actuating portion located therealong in advance of the saw location but effectively beyond the detaining stop's location, causing deflection of said cam follower means to effect gripping of a board, and a holder element deactuating portion located therealong beyond the saw location and causing reverse deflection of said cam follower means to effect release of the resawn board from the holder and cooperative positioning elements.

22. The shake board resawing machine defined in claim 17, wherein the cooperative positioning further comprises a second endless carrier member disposed on the opposite side of the cutting plane from the first carrier member, means driving and guiding said second carrier member conjointly with the first carrier member in a circuitous path, and a plurality of presser elements and locating gauges connected to and movable with said second carrier member in numbers and positions thereon corresponding to the respective holder elements of the first carrier member cooperating therewith for holding and positioning of boards being fed through the saw thereby.

23. In a shake board resawing machine, means to hold a board by an end portion thereof in fixed position relative to the cutting plane comprising a lateral supporting gauge disposed for engaging a board's froe edge or the like, said gauge having board-contacting abutments thereon spaced from each other parallel to the board's

width by a distance less than the contacted width of the widest board but greater than the contacted width of the narrowest boards to be resawn in the machine, means supporting said gauge with said abutments spaced by equal distances, less than the thinnest board's thickness, from the cutting plane, said gauge having a third board-contacting fixed abutment thereon located generally intermediately to the first-named abutments and spaced appreciably farther from the cutting plane than the first-named abutments, presser means disposed on the opposite side of the cutting plane for engaging the opposite side of a board positioned for cutting in contact with said abutments, and presser-actuating means operable to advance and retract said presser means to and from such board for gripping and releasing the same against said gauge.

24. The shake board resawing machine defined in claim 23, wherein the presser means comprise a first presser element disposed substantially opposite one of the first-named abutments, a second presser element disposed substantially opposite the intermediate abutment, means guiding said presser elements to permit movement of each thereof against the board independently of the other, and wherein the pressure-actuating means comprises a movable member and separate actuating springs interposed between such member and said pressure elements, respectively, to transmit actuating force to the latter for application to the board despite nonuniformities of the board's face engaged by said presser elements.

25. The shake board resawing machine defined in claim 24, and guide means engaged by one edge of a board gripped in the holder means, means supporting said guide means for locating said board's edge adjacent one of the first-named abutments on the side thereof away from the other abutment.

26. The shake board resawing machine defined in claim 25, wherein the guide means comprises a roll located adjacent the saw and having sharp annular projections on the periphery thereof which bite into the board's edge under pressure caused by sawing and thereby prevents lateral skidding or slewing of a board having a beveled edge.

27. In a shake board resawing machine, leading and lagging board holding elements gripping the board near opposite ends thereof at an incline relative to the cutting plane, carrier means movably connected to said holder elements for advancing the board through and beyond the saw, said leading and lagging board holding elements each having abutment means at fixed spacing from the cutting plane contacted by diagonally opposite edges of the board and retractible presser elements contacting the respectively opposite board edges actuatable to press the board against said abutment means, and presser element control means comprising an element operable to deactuate the lagging presser element immediately preceding completion of the resawing of the board, an element operable to reactuate such lagging presser element immediately following passage of the sawn board parts beyond the saw location and thereby support such parts

for further advance, and an element operable again to deactuate said lagging presser element for releasing the resawn board parts to permit removal thereof from the machine.

28. In a shake board resawing machine, board positioning and feed mechanism operable to advance shake boards in successive order generally endwise along a feed path progressively toward and through the saw with the boards positioned for cutting at an incline relative to the cutting plane in the direction of feed, said mechanism comprising a pair of endless carrier chains, means moving said chains in circuitous paths including parallel feed path stretches extending along opposite sides of the cutting plane, circuitous guide tracks extending along each chain and defining a lineal board feed path therebetween coinciding with the cutting plane, an even numbered plurality of runner elements for each chain, guided on said tracks and connected to and movable with the respective chains in sets of two at intervals along the lengths thereof, the runner elements of each set being spaced apart from each other along said tracks by approximately the length of a shake board and those on one chain being located in corresponding opposite positioning to those on the other chain to form coacting carriage sets each for supporting and advancing a single board therebetween, lateral board gauges carried by every other runner element on each chain in alternate arrangement to lateral board gauges carried by every other runner element of the other chain, said lateral board gauges of each carriage set having contact surfaces adapted for engaging the respective opposite free edges of boards to locate the same in fixed adjacent position relative to the cutting plane in the cutting position of such boards, normally retracted presser elements carried by the remaining runner elements of the respective chains and laterally actuatable for pressing the boards in cutting position against the contact surfaces of said lateral board gauges, stationary cam means arranged along the board feed path stretches, and cam follower means engageable with said cam means and movably connected to the presser elements for actuation and deactuation thereof, said cam means having control discontinuity surfaces thereon located along the board feed path at respective positionings for actuating the presser elements of each carriage set automatically by approach thereof along the feed path to the saw location and for deactuating such presser elements by movement thereof beyond the saw location, respectively.

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References Cited in the file of this patent
UNITED STATES PATENTS

Number	Name	Date
260,375	Estabrook	July 4, 1882
288,173	Gowan	Nov. 6, 1883
1,673,084	Loken	June 12, 1928
1,796,369	Hirst	Mar. 17, 1931
1,895,016	Whiting	Jan. 24, 1933
1,934,087	Payzant et al.	Nov. 7, 1933