Oct. 29, 1968 L. I. RITCHIE 3,407,855

BLANK-SPLITTING DEVICE

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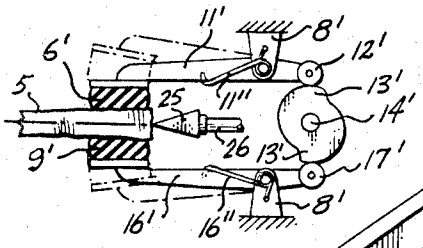


Fig. 5.

Fig. 2.

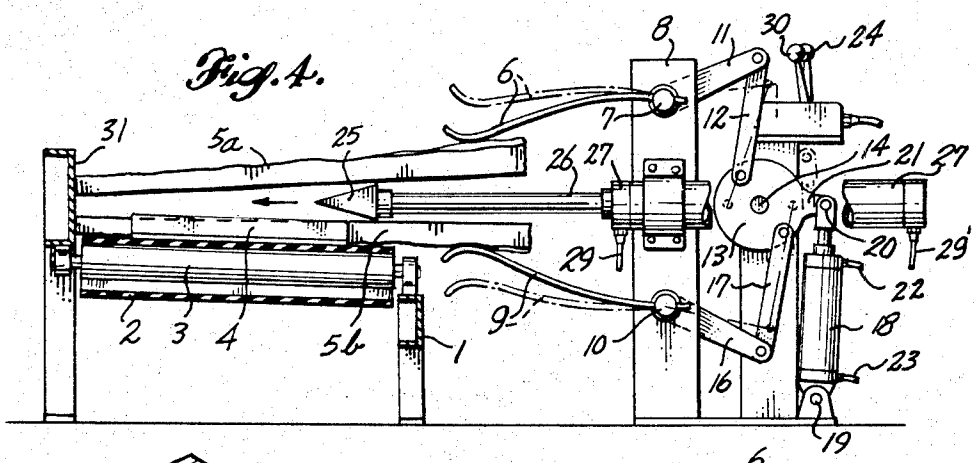


Fig. 4.

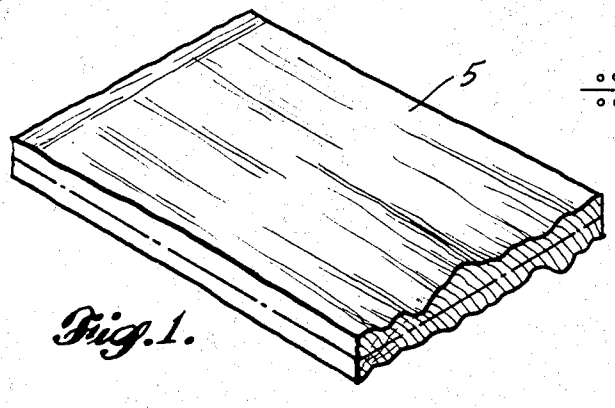


Fig. 1.

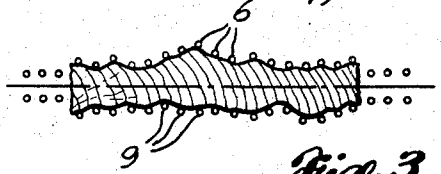


Fig. 3.

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BLANK-SPLITTING DEVICE

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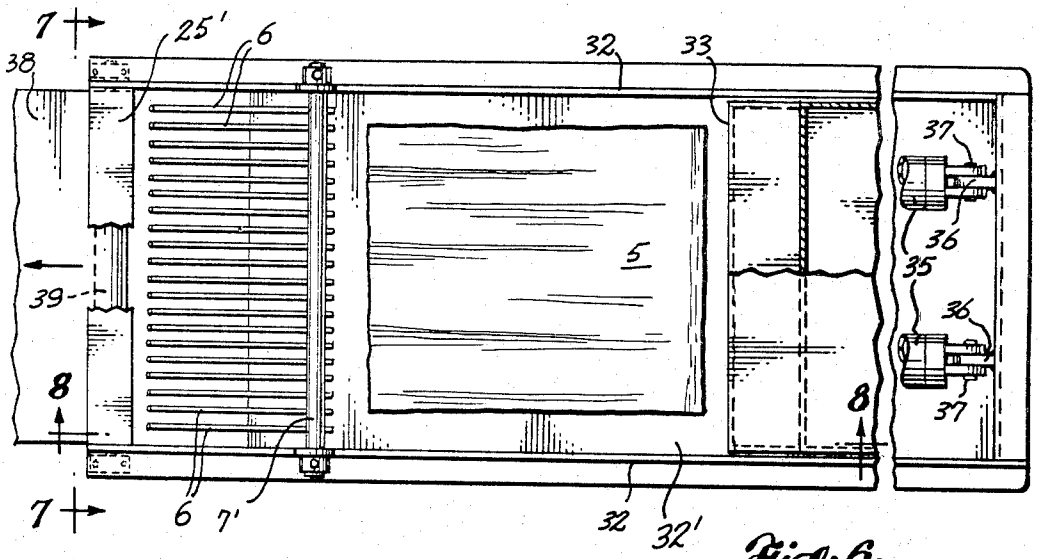


Fig. 6.

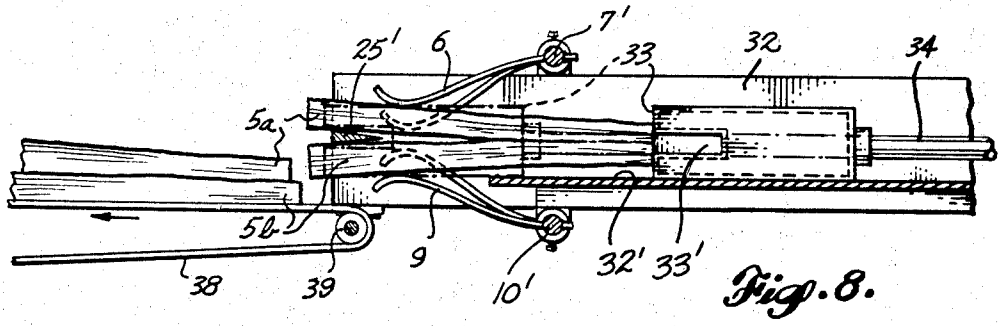


Fig. 8.

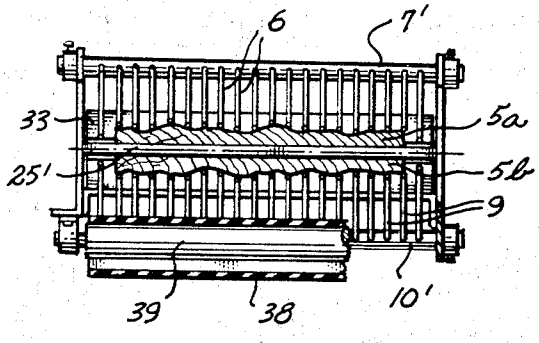


Fig. 7.

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BLANK-SPLITTING DEVICE

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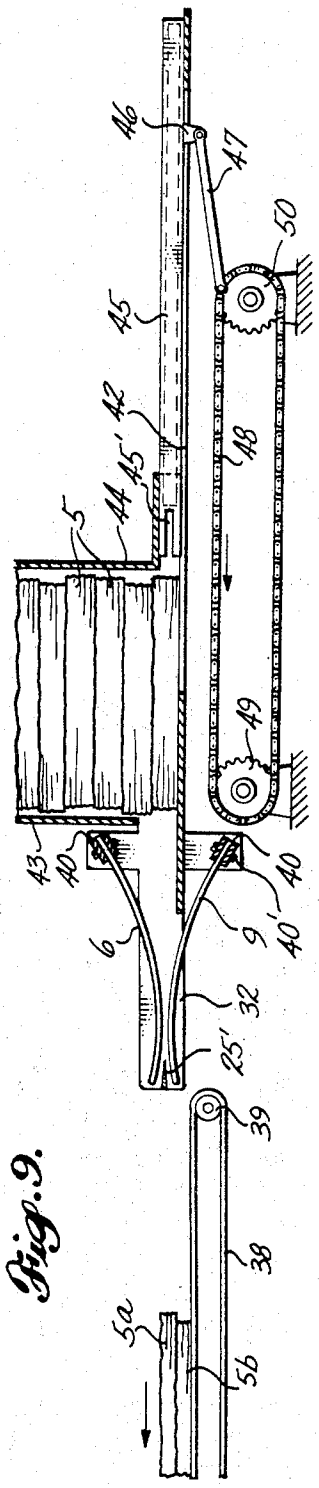


Fig. 9.

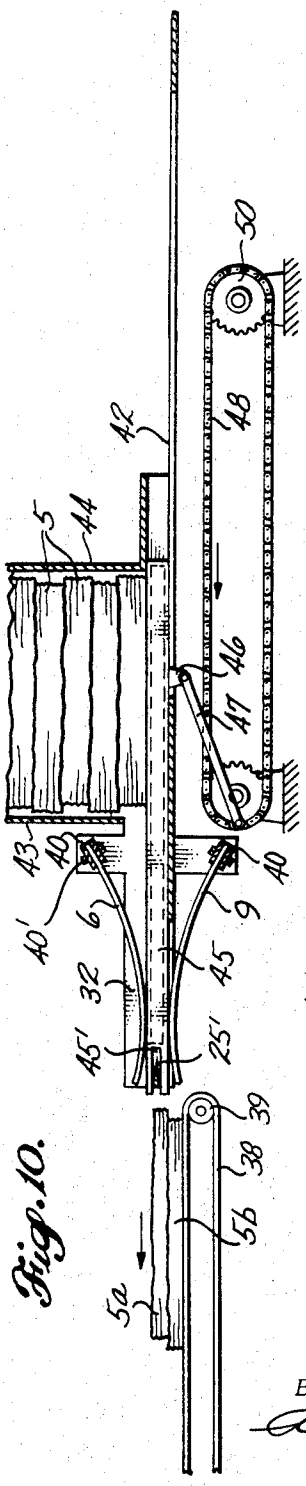


Fig. 10.

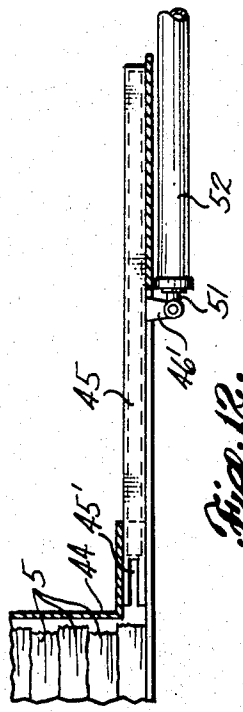


Fig. 12.

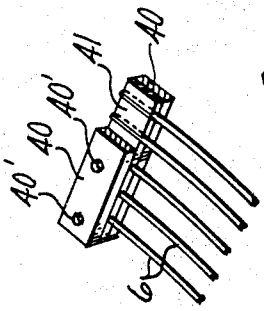


Fig. 11.

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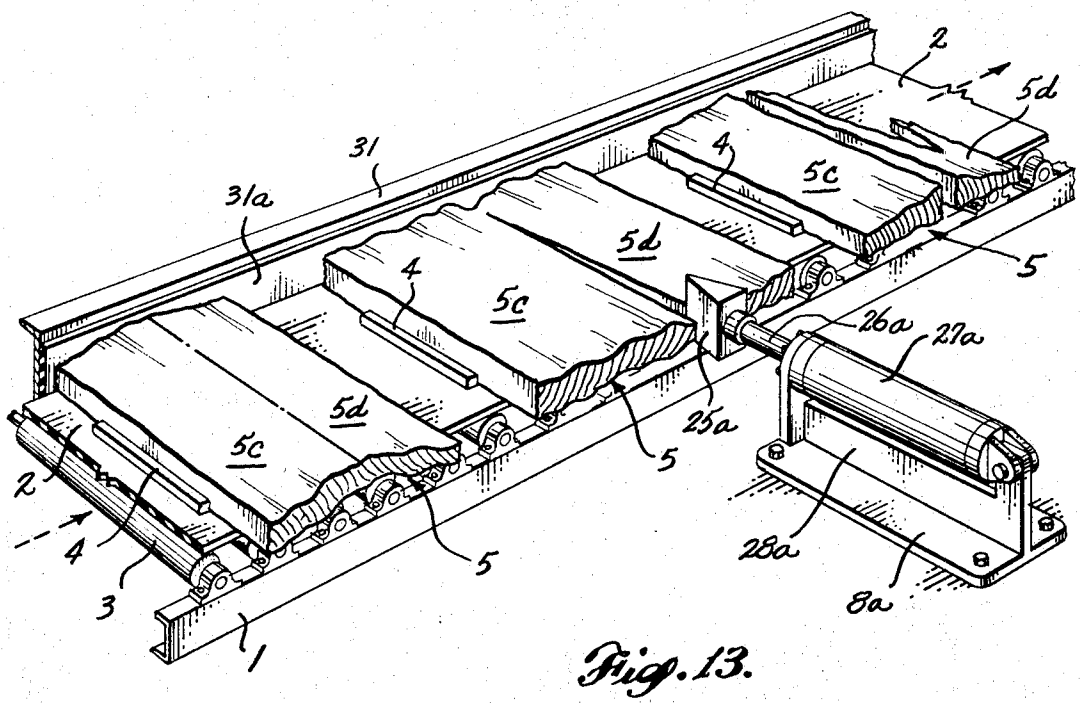


Fig. 13.

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Patented Oct. 29, 1968

3,407,855

BLANK-SPLITTING DEVICE

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Continuation-in-part of application Ser. No. 513,968, Dec. 15, 1965. This application Mar. 15, 1966, Ser. No. 534,354

11 Claims. (Cl. 144—193)

ABSTRACT OF THE DISCLOSURE

A generally flat blank from which shake boards are to be split is moved transversely of the length of its grain on a conveyor into a position in which a froe driven by a fluid-operated piston and cylinder can be moved to engage an end of the blank to split it at a desired location. Two opposed resilient locating gripper means can engage opposite sides of the blank to locate the position where it is to be split relative to the froe. Each of the opposed gripper means is resiliently deformable to engage irregularities in the surface of one side of the blank and may be composed of a row of resilient fingers supported in cantilever fashion, or include a resilient compressible pad of sponge plastic material. The gripper means can be mounted on pivoted supports to swing between positions engageable with a blank to be split and a retracted position out of engagement with such a blank. Crank mechanism or cam mechanism can be coordinated with movement of the splitting froe to move the gripping means into engagement with the blank until after the froe has engaged the end of the blank and penetrated it somewhat, and then the supports for the gripper means can be swung to withdraw the gripper means from engagement with the blank.

This application is a continuation-in-part of my patent application Serial No. 513,968, filed December 15, 1965, for Blank-Splitting Device. This invention relates to apparatus for splitting blanks into boards in the process of manufacturing handsplit, resawn shakes and to apparatus for splitting such blanks which are too wide or in which there are defects into narrower blanks.

Blocks of red cedar or similar wood, usually of approximately quadrant shape and of a length equal to the length of shakes to be manufactured, are split by a froe into blanks having a thickness of 1¼ inches to 2½ inches and a width from a few inches up to a couple of feet or so. Such a blank is of sufficient thickness to make the butts of two shakes and the tips of two shakes, and such thickness will be generally uniform from end-to-end of the blank. If a blank is greater than about fourteen inches in width or if it has defects in it, such as being excessively warped or having a jagged edge, it is desirable to reduce the width of the blank to a width not exceeding fourteen inches, or ot split the blank at the crown of a warped portion, or to split off a jagged edge portion to provide a blank of substantially flat, substantially uniform width not exceeding fourteen inches. Such a blank is then split generally along a plane parallel to its two faces to make two boards of as nearly equal thickness as possible. Each of these boards also should be of substantially uniform thickness throughout its length and of a thickness equal to the thickness of a shake butt plus the thickness of a shake tip, plus allowance for the thickness of a saw kerf. Such boards are then resawn on a diagonal to provide the butt of one shake at one end and the tip of such shake at the opposite end of the board, with the butt of a second shake at such opposite end of the board and the tip of such second shake at the first end of the board.

The purpose of the present invention is to provide apparatus which will facilitate splitting of shake blanks to

reduce their width, to make their widths substantially uniform, to make such blanks substantially flat, and to make boards from such blanks, and which will enable such a blank-splitting operation to be performed more accurately.

A principal object of the invention is, therefore, to conserve timber from which shakes are manufactured and to increase the uniformity of handsplit shakes by effecting splitting of blanks widthwise into substantially flat blanks of substantially uniform and sufficiently narrow width and by splitting such blanks into boards more nearly centrally between the opposite principal surfaces of the blank.

Another object of the invention is to provide apparatus for splitting shake blanks widthwise at desired locations and for splitting shake blanks into boards automatically so that it is only necessary for an operator to supply blanks to the apparatus, actuate the apparatus to effect the splitting operation and remove the resulting boards. Moreover, such apparatus may include mechanism to place individual blanks in position for splitting, in which case it is only necessary for an operator generally to supply blanks to the apparatus, and the apparatus can also remove the boards resulting from splitting of the blanks to a location remote from the splitting apparatus such as to the location of a resaw.

In such apparatus a specific object is to provide locating means which will locate a blank accurately in relation to a blank-splitting froe irrespective of the roughness of the opposite surfaces of the blank.

A further object of the invention is to provide apparatus which is semiautomatic in operation, yet which is economical to manufacture and will require a minimum of adjustment to handle blanks of different length and thickness, and which will need a minimum of maintenance.

The foregoing objects can be accomplished by a conveyor for moving the blanks into a predetermined position relative to a splitting froe, either for the purpose of splitting the blanks widthwise or for the purpose of splitting the thickness of the blanks to produce boards from them. The splitting apparatus for splitting the thickness of blanks into boards has centering means of resilient character conformable to irregularities in the surfaces of a blank to be split, which means will center such blank in relation to a blank-splitting froe. Specifically, such centering means can include opposed rows of gripping fingers or opposed resilient pads engageable with opposite sides of a blank to be split. In addition, the apparatus includes mechanism to effect relative movement between a blank to be split and the froe while the blank is held in proper position relative to the froe by the centering means. The moving mechanism can drive the froe into the end of the blank to be split or can drive the blank lengthwise past a stationary froe.

FIGURE 1 is a top perspective of a shake blank, the thickness of which is to be split to form boards, and FIGURE 2 is a top perspective of one type of apparatus for splitting such blanks into boards. FIGURE 3 is a detail section through centering mechanism of the apparatus.

FIGURE 4 is a side elevation of the blank-splitting device shown in FIGURE 2.

FIGURE 5 is a fragmentary side elevation of a modified blank-splitting construction.

FIGURE 6 is a plan of another type of blank-splitting apparatus; FIGURE 7 is a transverse section of such apparatus on line 7—7 of FIGURE 6, with parts broken away; and FIGURE 8 is a longitudinal section through such apparatus on line 8—8 of FIGURE 6.

FIGURE 9 is a longitudinal section through still a different type of blank-splitting apparatus showing parts in one operative position, and FIGURE 10 is a similar view with parts in a different operative position.

FIGURE 11 is a detail top perspective of finger-mounting mechanism with parts broken away.

FIGURE 12 is a longitudinal section of a portion of blank-splitting apparatus illustrating a modification of the apparatus shown in FIGURES 9 and 10.

FIGURE 13 is a top perspective of apparatus for splitting blanks widthwise into narrower blanks.

The blanks used in the manufacture of shakes for roofing and sidewall construction, which are to be split by the apparatus of the present invention, are of a length corresponding to the length of the finished shake and may be from 16 inches to 30 inches, but usually would be 18 inches, 20 inches or 24 inches in length. The width of such a blank would vary within the range of 4 inches to 14 inches at the time its thickness is split to produce boards from which shakes are to be sawn, but usually such a blank would be from 8 inches to 12 inches in width. Wider blanks would be split widthwise, as explained hereinafter, to produce blanks within this range of width before their thickness is split to form boards. The thickness of such a blank would be within the range of 1¼ inches to 2½ inches. A representative shake blank of the type to be split by the apparatus shown in FIGURES 1 to 12 inclusive to produce boards is shown in FIGURE 1. It will be noted that the left end of this blank is quite flat because that was the location at which the froe entered the end of the block in splitting from it the blank illustrated. The opposite end of the blank, however, can have quite an irregular surface, as shown.

Blanks to be split by the apparatus of FIGURES 2, 3 and 4 are fed to the apparatus by a belt conveyor including a supporting frame **1**, an endless belt **2** and rollers **3** mounted on the frame and disposed between the upper and lower stretches of the belt **2** for supporting it. On such belt are cleats **4** extending crosswise of the belt to engage the edges of blanks **5** for feeding them transversely of their lengths to the blank-splitting station. In splitting a blank into boards it is desirable for the froe to enter the end of the blank which has the most irregular side surfaces. Each of the resulting boards will then have one side with a flat surface portion at one end and an irregular surface portion at the other end and the opposite side of such board will also have a flat end portion and an irregular end portion. Each end of each board will also have a flat surface on one side and an irregular surface on its opposite side. Consequently, in resawing such a shake the cut will be from a location adjacent to the smoother side of one end of the shake to the smoother side of the opposite end of the shake so that the tip will be of substantially uniform thickness, whereas the butt will have one flat sawed side and the surface of the other side will be more or less irregular. This arrangement is desirable both to enhance the rustic appearance of the shakes and to provide a tip portion of substantially uniform taper over which the butt portion of an upper shake can lie smoothly.

For the reasons discussed above it is desirable to start the split of a blank from the end having the most uneven surface portions. In order to make the shakes produced from the resulting boards of substantially uniform butt thickness it is necessary for the froe to engage as near the center of the average block thickness as possible. For this purpose the location of the froe can be established more accurately by balancing gripping forces than simply by observation.

To position a shake blank by balancing gripping forces the resilient centering grippers conformable to irregularities in the surface of the blank at the end to be engaged by the froe are shown in FIGURES 2, 3 and 4 as including opposed rows of spring fingers. In FIGURES 2, 3 and 4 spring fingers **6** are mounted in one row by the bar **7** drilled at spaced intervals through which the supporting ends of the spring fingers can be inserted. This shaft is rotatively supported by one end in a post **8**. The opposed row of spring fingers **9** beneath the spring fingers **6** is supported by a second rod **10**, which also has one end rotatively mounted in the post **8**.

To the supported end of the rod **7** is secured an arm **11** connected by a link **12** to an eccentric location of a disk crank **13** rotatively supported by a shaft **14** mounted in cantilever fashion on a support **15**. Similarly, an arm **16** is mounted on and projects radially from the supported end of the rod **10**. The swinging end of this arm is connected by a link **17** to an eccentric location on the crank disk **13** at the side of its axis opposite that to which the link **12** is connected. The disk crank is oscillated by a hydraulic jack **18** mounted between a pivot **19** on the support **15** and a pivot **20** connected to the lever arm **21** of the disk crank **13**.

Hydraulic liquid is supplied to the connection **22** at one end of the jack **18**, and to the connection **23** at the other end of such jack. Control over such liquid supply is effected by the operator swinging control lever **24**. By swinging this lever in one direction liquid will be supplied to the connection **22** so that the jack will be contracted in effective length to the position shown in FIGURE 4, in which the links **12** and **17** are projected away from each other to swing arms **11** and **16** into the positions in which the gripping fiingers **6** and **9** are in the solid-line positions shown in this figure in engagement with opposite sides of the blank. When the lever **24** is swung in the opposite direction hydraulic liquid will be supplied to the connection **23** and hydraulic liquid can return from the cylinder through the other connection **22**. By this operation the jack **18** will be extended to rotate the crank disk counterclockwise for drawing the links **12** and **17** toward each other. Such movement of the links will swing the levers **11** and **16** toward each other also for rotating rods **7** and **10** to swing the resilient fingers **6** and **9** from the solid-line positions of FIGURE 4 into the broken-line positions. In these positions the spring fingers will be withdrawn from contact with the blank.

The froe **25**, for splitting the blank **5** into boards **5***a* and **5***b*, is mounted on the end of a plunger **26** which is reciprocated by the fluid-pressure cylinder **27**. Such cylinder is supported by an arm **28** from the post **8** in a position such that the froe **25** is centered between the rows of resilient fingers **6** and **9** when they are in their relaxed positions. Connections **29** and **29'** are provided at opposite ends of the cylinder to be connected to a source of hydraulic liquid under pressure. Alternately one of these connections is connected to the liquid source and the other will be the return line from the cylinder. To control the supply of the hydraulic liquid to these connections a lever **30** is provided for manipulation by the operator. When this lever is moved in one direction liquid will be supplied to the connection **29** for retracting the plunger **26**. When the lever is swung to the other extreme position liquid under pressure will be supplied to the connection **29'** at the other end of the cylinder **27** for projecting plunger **26** while liquid can be drained from the connection **29**.

The width of belt conveyor **2** is small enough so that a substantial portion of the length of each blank projects beyond the conveyor belt, as shown in FIGURE 4. When the belt has been moved so that a cleat **4** locates a blank with its end in registry with the rows of resilient fingers **6** and **9**, the belt will be stopped and the control lever **24** will be swung into a position such that jack **18** will be contracted to swing the rows of resilient fingers toward each other by rotation of the disk crank **13**. These fingers will engage the projecting end of the blank, as shown in FIGURE 3, so that various fingers will engage portions of the blank surfaces at different elevations. The fingers will, however, cooperatively locate the blank so that its end adjacent to the froe **25** will be lifted from the conveyor into a position centered with rsepect to the froe.

Next, the lever **30** can be swung by the operator for the purpose of supplying liquid under pressure to cylinder **27** so as to project the plunger **26** and drive the froe into the end of the blank **5**. Such pressure will slide the blank endwise until its opposite end is engaged with the backing

flange 31 on the side of the conveyor opposite the grippers and froe. The froe will then be moved from the position of FIGURE 2 to that of FIGURE 4, splitting the blank into the two boards 5*a* and 5*b*. As the froe moves between the boards thus formed the boards will be spread apart, as shown in FIGURE 4, which will move apart correspondingly the resilient fingers 6 and 9. Such fingers will still hold the boards firmly in centered position with respect to the froe. The conveyor belt 2 is sloped sidewise sufficiently so that, as the froe pries apart the boards, the lower board 5*b* will be swung downward toward the conveyor belt without appreciable pressure being exerted on the conveyor belt, or upward on the froe.

When the blank 5 has been split into the boards 5*a* and 5*b*, as shown in FIGURE 4, the lever 24 is reversed so that the fingers 6 and 9 are swung into the broken-line positions of FIGURE 4 to release the gripping pressure from the boards. The lever 30 can next be swung to its opposite position, which will cause the hydraulic cylinder 27 to retract plunger 26 and froe 25, leaving the boards in stacked relationship on the conveyor 2. Drive of the conveyor can then be resumed to shift the split boards out of registry with the gripper fingers 6 and 9 while the next blank to be split is moved by the conveyor into registry with the gripper fingers. The conveyor will then be stopped again and the splitting process will be repeated.

In FIGURE 5 blank-splitting apparatus, similar to that shown in FIGURES 2 and 4, is illustrated except that the blank-gripping means incorporates resilient pads 6′ and 9′ instead of the fingers 6 and 9, described above. Such pads may be soft sponge plastic or sponge rubber of considerable thickness so that their thickness can vary sufficiently to embrace substantially contiguously the irregular surfaces of blanks such as shown in FIGURE 1. These pads 6′ and 9′ are mounted on the swinging ends of levers 11′ and 16′, respectively, which are mounted on fulcrum pivots in suitable upper and lower supports 8′.

On the ends of the levers 11′ and 16′ remote from the gripper pads 6′ and 9′ are rollers 12′ and 17′ which are engageable wtih the opposite lobes 13′ of a cam rotatively mounted by a shaft 14′. The levers 11′ and 16′ are spring levers having the springs 11″ and 16″ engaged with their pivots, respectively, and with the levers to urge the pad-carrying ends of the levers apart. Rotation of the cam to press its lobes 13′ against the rollers 12′ and 17′ will swing such levers to move their pad-carrying ends toward each other in opposition to the force of the springs 11″ and 16″. When rotation of the cam is continued in the counterclockwise direction through a small angle the rollers will ride off the cam lobes so that the springs 11″ and 16″ can snap the pad-carrying ends of the levers into the broken-line positions illustrated.

The operation of the apparatus equipped with the levers 11′ and 16′ and the gripper pads 6′ and 9′ will be operated in substantially the same manner as described with reference to FIGURES 2 and 4. The shake blank 5 will be moved edgewise by the conveyor 2 until the end of the blank is in registry with the gripper pads 6′ and 9′. The cam will then be rotated by turning shaft 14 into the position shown in FIGURE 5 in which the lobes 13′ have pressed the rollers 12′ and 17′ outwardly through a distance sufficient to cause the gripper pads 6′ and 9′ to embrace the end of the blank 5 for centering it relative to the froe 25. The plunger 26 will then be projected to drive the froe into the end of the blank for splitting it into boards. Following this splitting operation the cam will be rotated sufficiently to enable the rollers 12′ and 17′ of the levers 11′ and 16′ to move toward each other for opening of the levers.

In FIGURES 6, 7 and 8 a different type of apparatus is shown in which the froe 25′ is mounted stationarily between the two sides 32 of a frame while mechanism is provided to drive a blank endwise against the sharpened edge of the froe and past the froe. The side members 32 of the frame are spaced apart a distance sufficient to receive between these frame members on a bed 32′ a shake blank of a width as great as would ever be required to be split. As shown in FIGURE 6, such a blank is placed on the bed with its end having the most irregular faces closer to the froe 25′.

Between the position of the blank 5 shown in FIGURE 6 and the froe 25′ gripping means are located which are shown to be in the form of rows of resilient fingers 6 and 9 located one above the other. These gripping fingers are supported stationarily by rods 7′ and 10′, respectively. The gripping fingers are inclined toward each other and toward the fixed froe 25′ so that a blank to be split, which is moved endwise toward the froe, must first engage the centering resilient gripper fingers.

From the position shown in FIGURE 6 a blank 5 can be pushed endwise between the rows of gripper fingers and against the froe 25′ by a ram 33 sliding on the table 32′ and moved by plungers 34, which are driven by hydraulic cylinders 35. The ends of these cylinders, remote from the ram 33, are mounted on lugs 36 attached to the frame. Such lugs are connected to the cylinders 35 by pivots 37 to transmit the reaction thrust of the cylinders to the lugs without any tendency of the plungers 34 either to support the weight of the ram 33, or to press the ram down against the bed 32′. The ram can merely slide on the surface of the bed.

In order to split a shake blank by the use of this apparatus such blank is laid on the bed 32′ between the ram 33 and the rod 7′ supporting the upper resilient finger rods 6. When the ram is driven to the left by the cylinders 35 projecting the piston rods 34, the leading end of the blank will be moved between the upper and lower rows of resilient centering gripper fingers 6 and 9 so that the leading end of the blank will be centered with respect to the stationary froe 25′. Continued movement of the ram to the left, as seen in FIGURE 8, will cause the shake blank to be forced on past the opposite sides of the froe to split the blank into upper and lower boards 5*a* and 5*b*. The gripper fingers 6 and 9 will continue to press against the opposite sides, respectively, of the blank end boards until such boards have been driven completely past the fingers 6 and 9 and the froe 25′. The end of the ram remote from the piston rods 34 has in it a deep groove 33′ forming bifurcations which will pass along opposite sides of the froe 25′ so that the froe is received in such groove. This ram construction enables the ram to move the boards, into which the blank is split, completely past the froe 25′.

The boards 5*a* and 5*b*, into which the blank 5 is split, can be deposited on a removal belt conveyor 38 carried at one end by a roller 39. Such belt can transport the boards to a resawing station where the boards can be resawn into individual shakes, as described previously. By the time the boards have been pushed past the froe 25′ by the ram 33, the boards 5*a* and 5*b* will have passed beyond the position in which the fingers 6 and 9 can engage the boards. Such fingers will have become engaged with the upper and lower sides of the ram 33. Such ram will be moved by the plunger rods 34 into a position such that the stationary froe 25′ will be received in the deep groove 33′ in the leading edge of the ram 33.

The supply of liquid under pressure to the cylinders 37 is then reversed so that the cylinders will retract the plunger rods 34. Such movement of the plunger rods will withdraw the ram 33 from the position between the resilient gripper fingers 6 and 9 so that these fingers can move into the broken-line positions indicated in FIGURE 8. Retraction of the ram 33 can then be continued until it has been moved into the position shown in FIGURE 6 in which another blank can be deposited on the bed 32′ to be split in accordance with the procedure described above.

In the apparatus shown in FIGURES 9 and 10 the blanks 5 to be split can be stacked to be processed successively by the splitting apparatus. In this instance, as in the case of the apparatus shown in FIGURES 6 and 8, the centering grippers are formed of resilient wire fingers 6 and

9 arranged in rows one above the other adjacent to the sharpened edge of the froe 25'. In this instance, however, instead of the individual wires being held in individual bores drilled in mounting rods, the supported ends of the wire fingers are clamped between upper and lower bars 40 by bolts 40'. The rods are held in properly spaced relationship by filling material 41, as shown in FIGURE 11, in which the supported ends of the wires are imbedded. Such filling material can be resin, babbitt metal or other hard filling material which, preferably, is settable from a liquid or plastic state.

The stack of blanks 5 are supported upon a bed plate 42 of the apparatus above which the side plates 32 project. The blanks are confined between front and rear walls 43 and 44 projecting upward from the side plates 32. Sufficient clearance must be left between the lower edge of the front wall 43 and the bed plate to pass the thickest blank to be split. On the other hand, the lower edge of the front wall 43 should be spaced above bed plate 42 a distance less than twice the thickness of the thinnest blank to be split. The lower edge of the rear wall 44 should extend downward to a location closer to a ram 45, movable beneath this wall, than the thinnest blank to be split.

The ram 45 is arranged to slide on the bed 42 between the retracted position shown in FIGURE 9 out of registry with the blank-receiving hopper 43, 44 and the projected position shown in FIGURE 10 extending beneath such hopper and to the left beyond it. Such reciprocation of the ram is effected by application of reciprocating force to the lug 46 projecting downward through a slot in the bed 42. Two or more of such lugs can be provided, if desired. Each of such lugs is connected by a link 47 to an endless drive chain 48 which is mounted on two sprockets 49 and 50 spaced lengthwise of the direction of movement of the ram 45.

The endless chain 48 is driven in the counterclockwise direction, as seen in FIGURES 9 and 10. As the lower end of link 47 is pulled to the left along the upper stretch of the chain 48, the leading end of the ram 45 will slide through the slot between the lower edge of the rear wall 44 of the blank hopper and the bed 42, and will push the lowest blank from the bottom of the stack. Such blank will be pushed to the left, as seen in FIGURE 9, into engagement with the centering resilient gripping fingers 6 and 9 so that the leading end of the blank will be centered with respect to the froe 25' by the time such blank end reaches the froe. Continued movement of the ram 45 will force the blank against and past the froe so that it will be split into upper and lower boards 5*a* and 5*b*, which will be deposited on the belt conveyor 38.

During such movement of the ram 45 the stack of blanks 5, from which the lowest blank has been removed, will drop onto the upper side of the ram while the blank now lowest in the stack will be held against movement to the left by engagement of its leading end with the lower portion of the front wall 43. As the ram is retracted movement of the blanks to the right will be prevented by their engagement with the rear wall 44 of the hopper until the ram has been withdrawn completely from beneath the stock into the position shown in FIGURE 9. Such movement of the ram to the right from the position of FIGURE 10 to that of FIGURE 9 will be effected by the link 47 being pushed by the movement to the right of the lower stretch of chain 48.

As the lower end of link 47 is driven upward around the right sprocket 50 the upper stretch of chain will again move the link 47 to the left so that the ram 45 will eject the next lowest blank from the bottom of the stack in the hopper 43, 44 and drive it against and past the froe 25'. A deep groove 45' is formed in the leading end of the ram 45 to receive the froe 25' between the bifurcations of the ram formed by such groove when the ram is in its position farthest to the left, as shown in FIGURE 10.

The mechanism of FIGURE 12 is generally similar to that of the apparatus illustrated in FIGURES 9 and 10, except that, instead of the ram 45 being reciprocated by a link attached to an endless chain, the reciprocation of the ram is effected by a plunger 51 reciprocated by a hydraulic cylinder 52, which plunger is attached to a lug 46' projecting downward from the ram 45 through a slot in the bed 42. Such hydraulic cylinder will be double-acting and the supply and discharge of hydraulic liquid to it will be controlled to effect successive reciprocating strokes of the ram 45 in the manner described in connection with FIGURES 9 and 10.

If the blanks are not suitable for their thickness to be split into boards in the manner described above, because the blanks are warped or jagged or too wide, such blanks can be prepared for board productions by having their width split by the apparatus shown in FIGURE 13 before the thickness of the blanks is split. For splitting the blank width the blanks can be carried past a splitting station by a conveyor generally of the type shown in FIGURES 2 and 4. Such a conveyor is also illustrated in FIGURE 13 as including the supporting frame 1, an endless belt 2, rollers 3 carried by the frame and supporting the belt, and cleats 4 on the belt for the purpose of pushing the blanks 5 edgewise to the splitting station.

Mounted on a base 8*a* at the splitting station is a wedge-shaped splitting froe 25*a* disposed with its splitting edge upright, that is, transversely of the belt 2 and the shake blanks carried by it. This froe is mounted on the end of a piston rod or plunger 26*a* which is reciprocated by a fluid pressure cylinder and piston 27*a*, which preferably is of the double-acting type. Such piston and cylinder is mounted on the frame 28*a* supported by the base 8*a*. The stroke of the piston and cylinder should be sufficiently great so that the froe 25*a* can be driven from a location retracted sufficiently to be out of contact with the longest blanks to be transported by the conveyor to a position projected sufficiently to split completely the longest shake having the most twisted or tenacious grain which can be expected to be supplied to the splitter to be split.

Although the force exerted by the width-splitting froe 25*a* on a shake blank 5 ordinarily will not be as great as that produced on a blank by the thickness-splitting froe 25 shown in FIGURE 2, it is desirable for a backing flange 31 to be provided for the conveyor in the blank width-splitting apparatus, as shown in FIGURE 13. If desired, a resilient facing 31*a*, which also will resist wear, can be applied to the side of flange 31 adjacent to the shake blanks for engagement by their ends. While the speed of action of the fluid pressure piston and cylinder 27*a* may be sufficiently rapid so that it would not be necessary to interrupt movement of the belt and blanks carried by it during a splitting operation, it may be preferable to provide control means for stopping the belt momentarily during each splitting stroke of the froe 25*a*.

In FIGURE 13 three typical examples of shake blanks which it would be desirable to split widthwise are shown. In each instance the blank 5 has been split into two blank sections 5*c* and 5*d*. The first example of a blank which required widthwise splitting is shown at the right of FIGURE 13 as having been split. In this case one edge of the blank was so jagged as to prevent the manufacture of a board having clean edges. Consequently, the right edge portion of this blank was split off, to be discarded as portion 5*d*, and the remaining portion 5*c* is of substantially uniform width and has reasonably straight edges.

The central one of the three examples of blanks shown in FIGURE 13 is principally of excessive width and would require to be split widthwise so that neither the section 5*c* nor the section 5*d* would be wider than fourteen inches and preferably not wider than twelve inches. If such a reduction in width were the only objective, it would not make any difference where such a blank was split. In the particular illustration of FIG. 13, however, there is one location across the width of the blank, namely that

at which the split is being made by the froe 25*a*, which is thinner than other portions of the blank. Consequently, the shake manufactured from such a blank would also be thin at such a location. It would be undesirable for a shake to be excessively thin between its edges, whereas it is not so objectionable for the edge portion of a shake to be thin, since thinness at such location does not weaken the shake as a whole. Moreover, if necessary, it would be possible to trim the edge of the shake so as to eliminate a thin edge portion if such portion were too thin.

The third example of a blank which it would be desirable to split widthwise is shown at the left of FIGURE 13 as being a blank which is warped or bowed. To split such a blank from edge to edge, even if it were not of excessive width, would result in one board which would be quite thin at its opposite edges and a second board which would be quite thin in the middle. It is desirable for shakes to be of reasonably uniform thickness across their width while still maintaining a rustic, split appearance. The uniformity of thickness of shakes manufactured from a blank such as that at the left of FIGURE 5 can be approached much more closely if such a blank is split at the crown of the bow or warp, which is indicated by the broken line drawn on this blank. When this blank has reached the width-splitting station defined by the froe 25*a*, therefore, the froe should be actuated to split this blank as close as possible to the location designated by such line. A line would not actually be drawn on the shake to mark the location for cleavage, of course, but such line is shown in the drawings merely to identify the location at which the width of the blank should be divided.

I claim:

1. Blank-splitting apparatus comprising two opposed resilient locating gripper means, each resiliently deformable to engage irregularities in the surface of one side of a wood blank to be split, a froe adjacent to said gripper means, and means for effecting relative movement between said froe and such blank in a direction lengthwise of the grain of such blank for splitting such blank which is located by engagement of its opposite sides respectively by said opposed gripper means.

2. The blank-splitting apparatus defined in claim **1**, and means supporting the two opposed gripper means for relative closing movement to grip opposite sides of the blank and for relative opening movement to release the split blank.

3. The blank-splitting apparatus defined in claim **1**, in which each gripper means includes a row of resilient fingers supported in cantilever fashion.

4. The blank-splitting apparatus defined in claim **1**, in which each gripper means includes a resilient compressible pad.

5. The blank-splitting apparatus defined in claim **4**, in which each compressible pad is of sponge plastic material.

6. The blank-splitting apparatus defined in claim **1**, in which the means for effecting relative movement between the froe and the blank includes means for moving the froe lengthwise of the blank relative to the gripper means into blank-splitting engagement with blank.

7. Blank-splitting apparatus comprising a froe, means operable to effect relative movement of said froe and a generally flat wood blank in a direction transversely of the length of the grain of such blank, and drive means for moving said froe lengthwise of the grain of such blank when said froe and the blank have been moved into a relationship in which the froe is in registry with a location of the blank at which it is to be split.

8. The blank-splitting apparatus defined in claim **7**, in which the splitting edge of the froe is disposed substantially parallel to a principal face of the blank.

9. The blank-splitting apparatus defined in claim **7**, in which the splitting edge of the froe extends transversely of a principal face of the blank.

10. The blank-splitting apparatus defined in claim **7**, in which the means operable to effect relative movement of the froe and a blank to be split include conveyor means supporting such blank and moving it transversely of the length of its grain into a position in registry with the froe.

11. The blank-splitting apparatus defined in claim **7**, in which the drive means for effecting movement of the froe includes fluid-operated piston and cylinder means.

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