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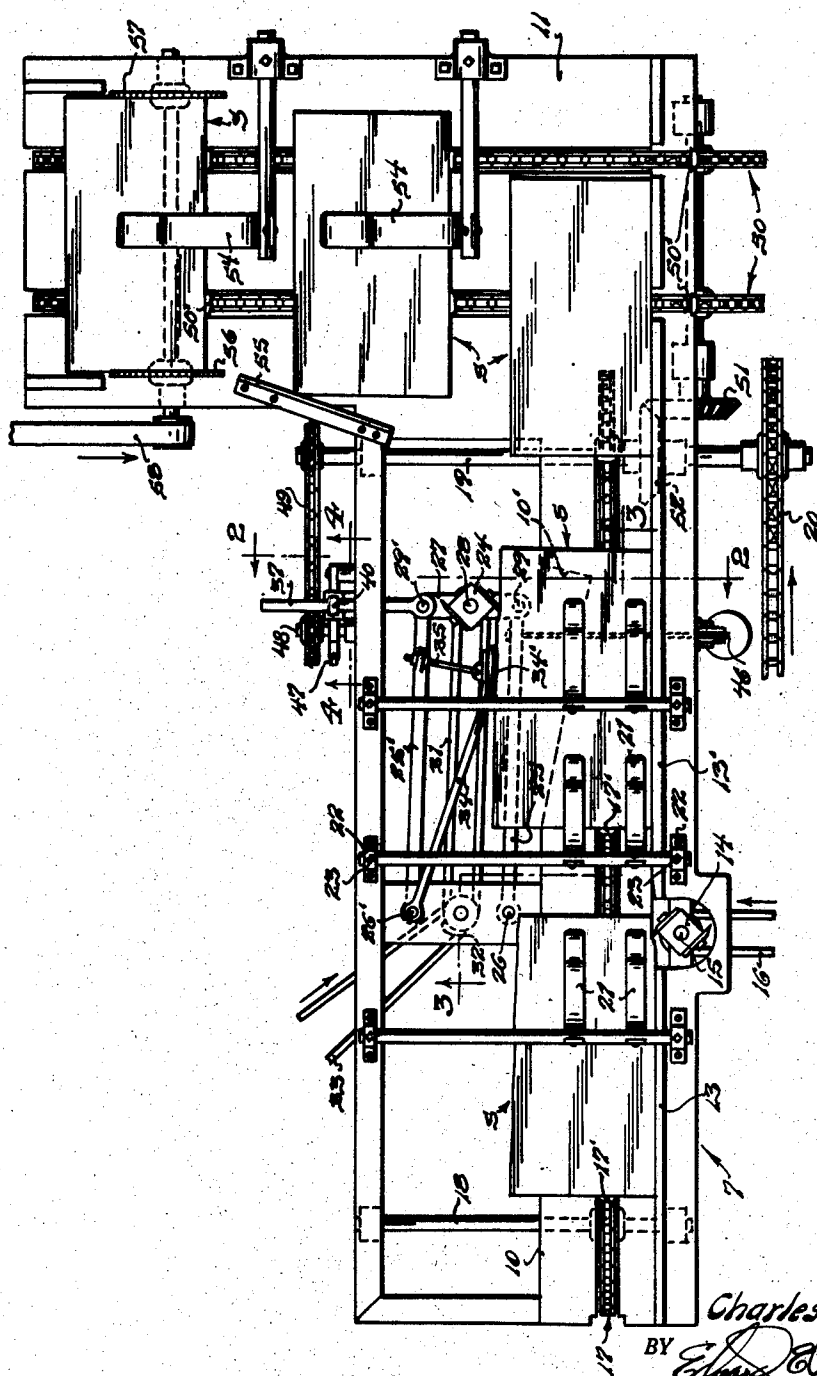
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2,273,653

EDGING AND BUTTING MACHINE

Filed Nov. 23, 1937

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

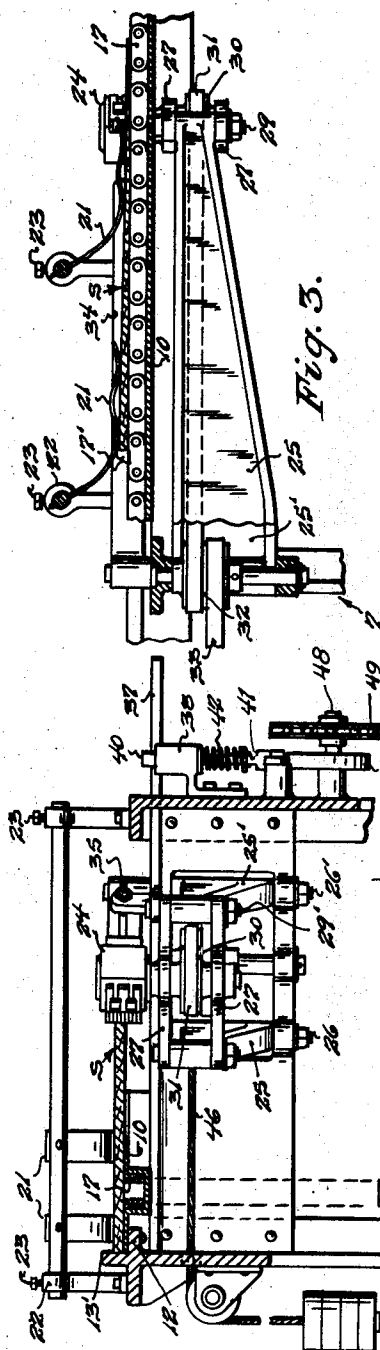


Fig. 2.

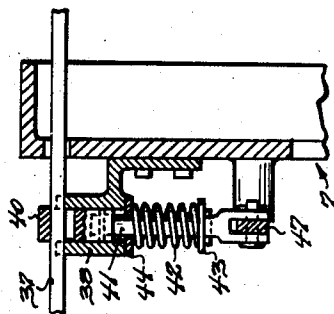


Fig. 3.

Fig. 5.

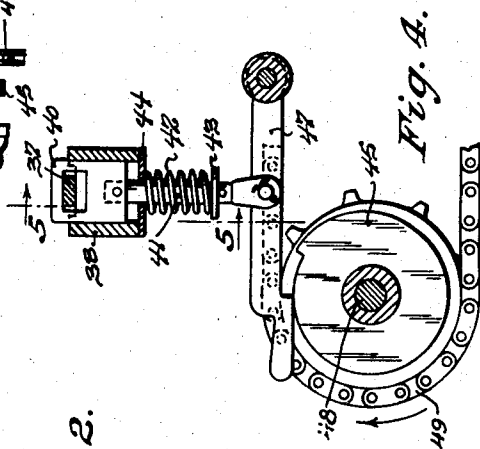


Fig. 4.

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EDGING AND BUTTING MACHINE

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10 Claims. (Cl. 144-117)

This invention relates to mill machinery and particularly to apparatus for edging and butting shingles, shakes, box-boards and the like demanding straight-sided production. The major objects of my invention are to provide means in mechanism of this character for obtaining an automatic trimming of variable-width stock to a parallel-sided contour and, in association therewith, means for obtaining an automatic trimming of the butt and the tip at right angles to the parallel sides of the work.

These foregoing objects with further and more particular ends and advantages will appear in the course of the following detailed description and claims, the invention consisting in the novel construction, adaptation and combination of parts hereinafter described and claimed.

In the drawings wherein I exemplify an illustrative embodiment of my invention believed to best portray a simplified assembly of parts according to the present improvements:

Figure 1 is a top plan view of the machine with the power devices for driving the feed and cutter mechanism deleted.

Fig. 2 is a transverse vertical section thereof taken to an enlarged scale on the line 2-2 of Fig. 1.

Fig. 3 is a fragmentary longitudinal vertical section taken on the line 3-3 of Fig. 1 and operating principally as an illustration, in elevation, of the swinging beam by which one of two complementary cutter heads is adjustably positioned.

Fig. 4 is a fragmentary longitudinal vertical section on line 4-4 of Fig. 1, the scale being appreciably enlarged; and

Fig. 5 is a fragmentary transverse vertical section on the line 5-5 of Fig. 4.

I prefer for simplicity in illustration and ease of description to indicate and to refer to the work handled by the machine as a "shingle," a term which it will be understood should be interpreted as including any form or material of stock capable of use with the machine. The machine in general comprises a table over which synchronized feed structure operates first to convey the shingle through edge trimmers and then through butt-and-tip trimmers and the frame therefor is represented in the drawings by the numeral 7, a frame which is formed from suitable structural members to a substantially L-shaped plan configuration with a table member 10 carried by one end and a table member 11 carried by the other extension of said L.

The former of these tables extends along one side only of the frame on a supporting shelf 12

and projecting upwardly from this shelf above the work-supporting surface of the table are guide ribs 13 and 13' disposed in jogged relation and spaced longitudinally at the point of the jog. 14 denotes a cutter head mounted on an arbor 15 in the space between said ribs with its knives being conventionally adjustable to maintain the circumferential cutting perimeter in alignment with the plane of the inner of the two guide ribs which extends longitudinally over the discharge end of the table from the head 14. 16 represents a belt drive for the cutter head.

Recessed in said table is a channel and operating in this channel is an endless conveyor chain 17 passing about sprocket wheels mounted on horizontal shafts 18 and 19 of which the former, an idling shaft, is adjustable for taking up chain slack and the latter, the drive shaft, driven by a chain 20 from power means such as an electric motor (not shown). At spaced intervals of the chain length are lugs 17' which extend above the table surface to engage the rear edge of the shingles for feeding the same longitudinally of the machine through the cutter head 14 and a complementary cutter head 24. During such longitudinal travel, pressure is applied to the shingles by leaf-type spring members 21 governed as to tension by the act of turning supporting rods which are fixed by set screws 23 in relation to bearings 22.

It is to provide means for transversely adjusting said complementary cutter head, whose office is to trim the outer edge of the shingle in parallelism to the inner edge trimmed by the head 14, that I employ a swinging bracket as a mounting for the same and I desirably form this bracket from a pair of parallel beam-arms 25, 25', pivoting the same independently by gudgeons 26, 26' and connecting their free ends by cross-linking 27, the cutter head being revolvably carried by an arbor 28 finding a bearing in the cross-linking intermediate the free-end pivots 29, 29'. Mounted on this arbor is a pulley 30 driven by belt 31 from an intermediate pulley 32 having a fixed axis between the gudgeons and driven from a power belt 33. The swinging bracket lies below the table and the supported cutter head in the path of the shingle travel and, for locating the latter in spaced relation to rib 13' according to the width of the shingle being trimmed, the invention provides a gauge arm 34 having one end journaled on gudgeon 26' and the other end adjustably coupled to beam-arm 25' by means such as a rod 35, an adjustment which serves to position a terminal toe element 34' of the arm in

a longitudinal plane determined by the cutting perimeter of the cutter head. The gauging toe 34' which, from contact by the moving shingle, positions the cutter head is comprised of a relatively weak leaf spring for a purpose which will appear in the course of the following.

To describe in more particularity the manner by which arm 34 positions the cutter head, it will be seen from an inspection of Fig. 1 that the free end of the swinging support for said head finds pivotal engagement at 29' with a locking bar 37, such locking bar extending laterally and having its outer end slidably received through an aperture formed in a block 40. The block is mounted for vertical movement in a bearing 38 in such a manner that the locking bar is caused to ride on the upper edge of the bearing, the latter in consequence acting as a stirrup-piece for the bar. The arrangement of bar, block and bearing is such that the block and bearing are caused by depression movement of the former to exert a pincers action upon the bar to clamp the latter against sliding movement. As a means for exerting depression influence on the block for effecting such clamping function I couple the block to a rod 41 and introduce over the latter, into bearing engagement with a face plate 44, a spring 42 which is loaded by a collar 43. Serving the office of intermittently elevating the rod 41 to relieve the bar 37 of the clamping force of the block 40 is a cam 45 driven by a shaft 48 which is in turn driven by a chain 49 from the shaft 19, the timing of this chain 49 being such in relation to the chain 17 which is likewise driven from said shaft 19 as to effect a release of the bar 37 from the pincers action of the block 40 simultaneously with the travel of the successive lugs 17' to a point whereat the following edge of a conveyed shingle has cleared the head 24. Upon such release of the bar the head 24 is caused to return to the innermost limit of its swinging travel by the action of suitable means such as the indicated weight-loaded cable 46 which finds connection with the free end of the swinging bracket. As best represented in Fig. 4, the cam action is transmitted to rod 41 and thereby to the block 40 through an intervening lever 47 with the action being such as to obtain a substantially instantaneous clamping of the bar 37 momentarily in advance of the shingle's progress into the sphere of the cutter head 24, such clamping function being maintained throughout a period of approximately 300° in the following revolution of the cam, this period being in correspondence with the time interval necessary to carry the shingle completely past the cutter head 24.

Reverting to the leaf spring 34' which locates the bracket as the leading tip of the shingle traverses the diagonal walk of the arm 34, it will now be readily seen that shingles having an outer edge diverging rearwardly would necessarily be crushed by the gauge toe were this surface to be secured in fixed relation to the machine frame, the utilization of the spring with its yielding characteristic permitting the gauge surface to give.

Considering now the table 11 which lies flush with but in right angular relation to the table 10, I provide therein recessed parallel channels for the reception of twin endless conveyor chains 50 passing about sprocket wheels suitably driven by bevel gears 51 and 52 in timed relation to the chain 17. Conveyor lugs 50' on these chains 50 engage the rear edge of the shingles as the con-

veyor lugs 17' of the chain 17 deliver the same to table 11, feeding the work forwardly on this table under pressure-applying leaf members 54 similar in nature to the members 21 to bring the leading edge into engagement with a gauging diagonally-disposed shear plate 55 which locates the work relative to a rotary butt-trimming saw 56. Associated with this saw is a tip-trimming saw 57 which, while indicated as revoluble in a fixed plane, is preferably adjustable axially on its arbor to permit the machine to be set for various lengths of work. 58 represents a power belt for driving the saws 56 and 57.

It will be noted that a cut-away portion of the table 10 provides a recession 10' by which the cutter head 24 moves into relative adjacency to the cutting plane of the head 14, this recession obviously acting to reduce the bearing surface for the conveyed shingle. It is to accommodate this reduction in bearing surface that the gauge arm 34, in actual application, is of channel construction with its lower web horizontally aligned with the table, the outer tip of the work entering the channel groove and being supported therein as the work is fed into cutting relation to the head 24. This arrangement should be clear without detailed illustration of the same, the drawings showing a plane-faced strip for maximum clarity in the representation of the diagonal shingle-tracking surface and the spring toe 34'.

A résumé of the operation is believed unnecessary as the machine and the steps performed should be clear from the foregoing. Numerous modifications might well be resorted to as, for example, the evident use if desired of swinging heads or their equivalent in other trimming devices at each side of the work. It is my intention that the hereto annexed claims be given a breadth in their interpretation commensurate with the state of the advance in the art.

What I claim, is:

1. In a trimming machine, in combination, a fixedly-located trimming device, an associated trimming device movable laterally toward and from the same, means for feeding the work into edge-trimming relation to said associated trimming devices, means operating automatically in response to the travel of the work into trimming relation to said trimming devices for positioning the movable trimming device relative to the fixedly located trimming device according to the width of the work being trimmed, and cam devices operating in timed relation to the work-feeding means for locking the movable trimmer at predetermined fixed intervals during the travel of the conveyor in the positions to which the same is moved by the work.

2. In a trimming machine, in combination with work-feeding mechanism, a trimmer positioned in the path of travel of the work with the feed mechanism, automatically-operated trimmer-governing means controlled by the width of the work being fed for shifting the trimming device transversely of the longitudinal plane of the work feed to accommodate the trimmer to various widths of work, and means timed by the travel of the conveyor to operate at fixed intervals for locking the trimmer in the positions to which the same is shifted by the work being fed.

3. In a trimming machine, in combination with a work-trimming cutter head, a supporting bracket therefor mounted for swinging movement about a fixed axis, a conveyor for feeding the work through a path traversed transversely

by the cutter head in the swinging movement of the latter, a gauge arm supported by the bracket to lie in a diagonal position across the path of travel of the work whereat the arm is engaged by the leading tip of the work in the travel of the same with the conveyor for swinging the cutter head about the pivotal axis of the supporting bracket into operative edge-trimming relation to the work, and means for successively locking and releasing the cutter head in and from its edge-trimming position in advance of the initiation of the trimming action and following the completion of the trimming action, respectively.

4. In a trimming machine, in combination with a work-trimming cutter head, a bracket supporting said head for swinging movement, a conveyor operating to feed the work through a path traversed transversely by the cutter head in the swinging movement of the head, means engaged by the leading tip of the work in the conveyor-fed travel thereof for swinging the bracket into a position whereat the cutter head lies in trimming relation to a side of the work, yieldable means resisting said head-positioning swinging movement of the bracket and operating to normally locate the latter at the innermost extreme of its swinging movement, and means entirely independent of the work being fed operating to successively lock and release the cutter head in and from its positioned work-trimming location at fixed intervals during the travel of the work longitudinally of the machine.

5. Structure as defined in claim 4 wherein the last-named means includes a cam synchronized with the conveyor.

6. In a trimming machine, in combination, a work-feeding conveyor, a work-trimming cutter head supported for transverse movement into and from the path of travel of the work, a pivotally mounted regulating arm by which said cutter head is operated into trimming relation to a side edge of the conveyed work disposed to normally extend diagonally from its pivot across the path of travel of the work into a position whereat the leading point of the side edge to be trimmed engages the same, means for locking said arm in its work-positioned head-regulating location prior to the initiation of the edge-trimming operation, and means for releasing said arm upon completion of the edge-trimming operation.

7. The structure defined in claim 6, said regulating arm being movable rearwardly about its pivotal axis as the leading point of the advancing work progresses over the interrupting diagonal surface of the arm and wherein the free terminus of the arm is yieldable to allow the same to give following the operation of locking the same.

8. In a trimming machine, a trimming device, a conveyor for feeding the work into trimming engagement with the trimming device, a regulating arm disposed to occupy a position diagonal to the path of the work travel, having functional

connection with the trimming device, and engaged by the leading tip of the work for obtaining relative adjustment as between the trimming device and the work, and locking means for securing said arm against movement and thereby maintaining said relative adjustment as between the trimming device and the work during the trimming operation, said regulating arm having, as the part thereof which is engaged by the work, a relatively weak leaf spring the function of which is to accommodate the passage of work which increases in width toward the rear thereof.

9. In a side-edge trimming machine: a trimming device; a conveyor for feeding the work into trimming engagement with the trimming device; a regulating arm having functional connection with the trimming device, and supported for movement into and from engagement with the side edge of the conveyed work which is to be trimmed and in such relation to the latter and to the trimming device as to effect said engagement in advance of the initiation of the trimming operation, said engagement acting to obtain relative adjustment as between the trimming device and the work; and locking means for securing said arm against movement and thereby maintaining said relative adjustment as between the trimming device and the work during the edge-trimming operation, said regulating arm having, as the part thereof which is engaged by the work, a relatively weak leaf spring the function of which is to accommodate the passage of work which increases in width toward the rear thereof.

10. In a side-edge trimming machine: a trimming device; a conveyor for feeding the work into trimming engagement with the trimming device; a regulating arm having functional connection with the trimming device, and supported for movement into and from engagement with the side edge of the conveyed work which is to be trimmed and in such relation to the latter and to the trimming device as to effect said engagement in advance of the initiation of the trimming operation, said engagement acting to obtain relative adjustment as between the trimming device and the work; and locking means for securing said arm against movement and thereby maintaining said relative adjustment as between the trimming device and the work during the edge-trimming operation, said regulating arm having, as the part thereof which is engaged by the work, a member yieldingly influenced into said engagement with the work and characterized in that its yielding movement is accomplished without disturbing the adjustment of the trimming device, the function of said yieldingly influenced member being to permit the same to give in accommodating the passage of work which increases in width toward the rear thereof.

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