C. PERKINS.
LEATHER BOARD MACHINE.
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Witnesses.

Franklin E. Lowe
Leonard A. Parcell

Inventor.

[Signature]

By his attorney, Charles S. Gooding.
LEATHER-BOARD MACHINE.

To all whom it may concern:

Be it known that I, CHARLES PERKINS, a citizen of the United States, residing at Bridgewater, in the county of Plymouth and State of Massachusetts, have invented new and useful Improvements in Leather-Board Machines, of which the following is a specification.

This invention relates to new and useful improvements in leather board machines and particularly to the machines known in the art as wet machines.

The object of the invention is to provide instrumentalities adapted to act automatically upon the collection of a predetermined amount of stock upon the collecting roll of said machine to sever said stock longitudinally of said roll and to strip said stock therefrom.

The invention consists in the combination and arrangement of parts whereby the above object and certain other objects hereinafter appearing may be attained, as set forth in the following specification and particularly pointed out in the claims.

Referring to the drawings: Figure 1 is a plan view of a machine embodying my invention, portions of said machine being broken away to save space in the drawings.

Fig. 2 is a rear elevation of the machine with portions of the frame broken away to save space in the drawings.

Fig. 3 is a transverse sectional elevation taken on line 3–3 of Fig. 1.

Fig. 4 is a transverse sectional elevation taken on line 4–4 of Fig. 1, portions of said machine being broken away and removed to save space in the drawings, said figure also illustrating the cutting instrumentalities in their normal inactive positions.

Fig. 5 is a section similar to Fig. 4 illustrating the cutting instrumentalities moved to their uppermost position relatively to the collecting roll with the cutter partially withdrawn from the cutter block.

Fig. 6 is a detail transverse sectional elevation taken on the line 6–6 of Fig. 1 illustrating the means for detecting the amount of stock collected by the collecting roll, parts of the machine being broken away and other parts removed to save space in the drawings.

Fig. 7 is a detail section taken on line 7–7 of Fig. 3 illustrating the latch for operably connecting the cutting instrumentalities with the collecting roll, said latch being shown in its two positions in dotted and full lines respectively.

Fig. 8 is a transverse section of one end of the collecting roll.

Fig. 9 is a detail plan view of the cutter bar and cutter and cams for moving said cutter bar longitudinally shown in section, portions of said cutter and cutter bar being broken away to save space in the drawings.

Fig. 10 is a diagrammatic view illustrating the cutter bar and the cams for moving said cutter bar longitudinally.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 10 is the main driving shaft which is journaled to rotate in suitable bearings in the frame 11 of the machine.

Secured to the shaft 10 is a driving roll 12 which is adapted to rotate in connection with a belt 13, preferably constructed of felt. A collecting roll 14 is rotatably arranged above and adapted to be supported by said roll 12 in contact with the belt 13. The collecting roll 14 is secured to a shaft 15 which extends beyond the opposite ends of said roll 14 and through the vertical slots 16 in the frame 11, a block 17 being arranged to engage and fit the upper portion of each of the ends of said shaft, said blocks being slidably arranged and guided in the slot 16 of the frame 11.

The stock is fed in a thin film and in a manner well known to those skilled in the art, but not shown in the drawings, to the upper surface of the belt 13 and as said belt is drawn between the rolls 12 and 14 said stock is picked up or adheres to the periphery of the collecting roll 14 and gradually builds up a layer of stock about said periphery. When the stock about said roll reaches a certain predetermined thickness it is necessary to sever or cut said stock lengthwise of said roll and to strip the same from the periphery thereof.

In the building up of the layer of stock on the roll 14 it is necessary that the exact amount of pressure be applied thereto in order to make said stock the desired consistency. For this purpose the weight of the roll 14 is always resting upon the film of stock and as said stock increases in thickness said roll will be elevated or moved laterally relatively to the roll 12 vertically in the slots 16. To still further aid in the compression of said stock levers 18 are fulcrumed at 19 in the forked members 20 secured to the frame 11. Rods 21 provided...
with forks 22 at their upper ends are interposed between the under side of the levers 18 and the blocks 17 in sliding engagement with a yoke 23 which spans the slot 16, while weights 24 are arranged in sliding engagement with the free ends of the levers 18 and adapted to be moved toward and away from the fulcrum 19 whereby more or less pressure may be brought to bear upon the blocks 17 and consequently upon the ends of the shaft 15. As said stock increases in thickness and approaches the predetermined thickness, the blocks 17 are gradually moved upwardly in the slots 16 and as said vertical movement takes place, means arranged in conjunction with said roll in contact with one of said blocks 17 are actuated and when a certain thickness of stock is reached which has been predetermined, other instrumentalities, normally inactive, are set into motion to sever said stock lengthwise of said roll and to strip said stock therefrom, while still other instrumentalities in their proper turn return said cutting and stripping instrumentalities to their normal inactive position in readiness to again be set in motion upon the collection of stock of the required thickness upon said roll. As a convenient form of means for detecting the predetermined thickness of said stock, see Figs. 1 and 6, I have provided a lever 25 which is pivoted at 26 to the yoke 23. An adjustable contact 27 is provided for said lever 25 which may engage said block 17 or preferably a lever 28 pivoted at one end upon a stud 29 carried by said block 17, while the opposite end of said lever 28 is provided with an adjusting screw 30, the end of which engages the block 17, thus permitting a finer adjustment for said lever than would be possible with the adjustable contact 27 alone. A spring 31 retains said contact 27 against the upper surface of the lever 26 and the screw 30 against the upper surface of the block 17. Upon the opposite side of the pivot 26 from the spring 30 and contact 27 is pivotally secured a pawl 32 which upon being moved by the rocking of the lever 28 operates means for setting into motion certain connecting instrumentalities hereinafter set forth.

Referring now to Figs. 1, 2, 3, 4 and 5 the collecting roll 14 is turned down or slightly reduced in diameter at 33, 38 adjacent opposite ends thereof and upon said reduced portions a cutter frame 34 is pivotally mounted, said cutter frame comprising side members 35 and 36 which are tied together at one side of the axis of the roll 14 by an angle 37 and upon the opposite side of said axis by a tie-rod 38. Said cutter frame is normally adapted to remain in the position illustrated in Fig. 3, that is, with the angle 37 in contact with a rubber bumper 39 secured to the cross frame 40 connecting opposite sides of the frame 11, the weight of said cutter frame being sufficient to retain the same in such a position.

Adjacent to the tie-rod 38 counterbalancing weights 41 are provided which are adapted to very nearly counterbalance the weight of the cutter frame and mechanism carried thereby, said cutter frame being slightly heavier than said weights. A cutter 42 is arranged upon said cutter frame exteriorly and longitudinally of said roll with its cutting edge 43 disposed toward the periphery of the roll 14, said cutter being preferably secured to the edge of a cutter bar 44 tangentially disposed relatively to a circle disposed between the axis of said roll and the circumference thereof within a recess 46 by a clamp plate 45. The cutter bar is sufficiently long to slidably engage the upper faces of the side frames 35 and 36, links 47 being provided which pivotally connect said cutter bar with the angle 37 and thus cause the cutting edge 43 of said cutter to always remain substantially parallel with the adjacent side of the roll 14, and each of said links being normally disposed at an angle to the adjacent face of said roll 14, consequently upon imparting a longitudinal movement to said cutter bar said links will tend to straighten and thereby cause said cutter bar to move in an oscillatory path toward the periphery of said roll 14.

As before stated the cutter frame with the cutter thereon is normally inactive, but upon the collection of a predetermined amount of stock about the periphery of said roll 14 said cutter frame is arranged to be rocked or moved circumferentially of said roll at the same rate of speed as said roll is being rotated, by means hereinafter more fully described. During said circumferential movement the cutter 43 is moved longitudinally and by said longitudinal movement laterally toward the periphery of said roll 14 and in contact with a cutter block 48, preferably formed of wood, which is inserted within a recess 49 formed in the rim of said roll and thus the material or stock will be severed thereby. For the purpose of imparting a longitudinal movement to said cutter during said circumferential movement to sever said stock I preferably provide a cam 50 segmental in shape and adapted to be engaged by a roll 51 journaled to rotate in the end of a swinging arm 52, which is pivoted at 53 to the end of said cutter bar 44, see Figs. 9 and 10, said cam being secured by screws 54 to the frame 11.

It is essential during the operation of said cutter that said cutter frame and said roll 14 be operated together to prevent any relative rotary movement therebetween. To accomplish such a uniform movement I have provided said roll 14 with abutments...
55, see Fig. 8, which at the proper times in the operation of the machine are operably connected to said cutter frame by means of latches 56, see Figs. 1, 4, 5 and 7, pivoted at 57 to the side frames 35 and 36 respectively.

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Said latches being normally retained out of the path of said abutment 55 by fingers 58 which depend from a rod 59 extending longitudinally of the angle 87 and journaled to rock thereon in bearings 60, said fingers being yieldingly retained in contact with stop pins 61 and in the positions to engage said latches by a spring 62, which engages a handle 63 on said rod and by which said said latches may be manually rocked, when occasion demands, to release said latches and permit the same to be engaged by their respective abutments. Upon the automatic release of said latches 56 when the proper amount of stock has collected about the periphery of said roll 14, the tooth 64 of the pawl 32, which is operated by the detecting means as hereinbefore described, is adapted to engage a projection 65 extending laterally from the shaft 59, see Fig. 5, against which the end of said pawl 32 is yieldingly retained in contact by means of the spring 66, to rock said rod 59 and thus release said latches whereby the springs 67 cause said latches to move from their full line positions Fig. 7 to their dotted line positions and into the path of the abutments 55. Immediately upon the release of said latches the abutments 55 engage the ends 68 thereof and the cutter frame will consequently be moved upwardly from the position illustrated in Figs. 3 and 4 to that illustrated in Fig. 5, but during the upward movement of said frame the first part thereof causes the cutter bar and cutter to be operated by the cam 50 to sever said stock, while during the remainder of the movement of said cutter frame from the point 69 of the cam 50 to the position occupied by said cutter bar in dotted lines in Fig. 10 and designated "b," the end 70 of said cutter bar engages a cam 71 which is also a segmental cam and secured to one portion of the frame 11, as indicated in Figs. 1, 2, 4 and 5, and this causes said cutter bar to be partially moved longitudinally toward the position occupied thereby on said cutter frame and indicated in dotted lines at "b," Fig. 10. This movement of said cutter bar slightly withdraws the cutting edge 48 of the cutter 42 from the cutter block. Simultaneously with the slight retraction of said cutter means are provided preferably consisting of cams 72 which engage the latches 56, rocking the same upon their pivots and disengaging the ends 68 thereof from the abutments 55 permitting the fingers 58 to engage the opposite ends thereof and retain the same out of engagement with said abutments and upon the releasing of said latches the weight of said cutter frame and the means carried thereby causes the same to return to its normal position against the bumpers 39. During this latter movement the roll 51 engages the inclined face 73 of the cam 50 whereupon the arm 52 will be rocked to the position illustrated in dotted lines at "c," Fig. 10, permitting said cutter bar to pass said cam 50 without being moved longitudinally thereby. As said cutter bar approaches its normal or lowest position the end 70 thereof engages another cam 74 which completes the withdrawal of said cutter from said roll. During the movement however of the cutter bar from the position indicated at "a" to that indicated at "c" the end of said cutter 42 engages said severed stock and strips it from the periphery of said rolls 14, while the continued rotary movement of said roll in the direction of the arrow "c," see Fig. 5, continues to feed the opposite end of said stock along the belt 18 until the same has been entirely freed from said rolls 12 and 14.

The continued contact of the cutter with the cutter block 48 soon causes such a deep recess to be formed in the surface of said block that the cutting operation is hindered and to remedy this a new block must either be inserted in said recess or the line of contact between said block and said cutter changed. The latter method has been found to be the most satisfactory in order to utilize practically the entire surface of the block.

To accomplish this the abutments 55 are provided with slots 75 through which screws 76 extend into the roll 14, thus permitting a circumferential adjustment of said abutments relatively to said cutter block. The impact however between said abutment and said cutter frame is exceedingly severe and to prevent movement or displacement of said abutments, stops 77 are positively secured to said roll 14 at the rear of said abutments and fillers 78 are adapted to be inserted between the ends 79 of said stops and said abutments. Said fillers 78 are furthermore adapted to be made in various thicknesses, thus to vary the circumferential distances between the abutments 55 and said cutter block.

The general operation of the device hereinafter specifically described is as follows: The stock is fed to the belt 13 in a thin film and as it passes between the rolls 12 and 14 it is picked up by the periphery of said roll 14 and gradually increases the thickness of the stock thereon until the predetermined quantity has been collected, whereupon the detecting means including the lever 25 are operated, as described, to release the latches 56 or connecting means from the fingers 58.
causing the same to engage the abutments 55, whereupon the cutter 42 will be carried by its cutter frame circumferentially of and at a uniform rate of speed with said roll 14 for a certain circumferential distance, and during said circumferential movement said cutter is operated first to entirely sever said stock, then to be slightly retracted or withdrawn from said stock and simultaneously with said partial withdrawal said cutter frame is released from said roll and permitted to return to its normal position during which movement said stock is stripped by said cutter from said roll and finally said cutter is returned to its normal position on said cutter frame in readiness to again be operated, as stated, upon the collection of the next predetermined amount of stock upon said roll.

From the foregoing description it will be seen that simple and efficient means are provided for accomplishing the objects of the invention, but while the elements herein shown and described are well adapted to perform the functions set forth, it is obvious that various minor changes may be made in the proportions, shape and arrangement of the several parts, without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire by Letters Patent to secure is:

1. In a machine of the class described, a collecting roll, a cutter block inserted in the rim of said roll, instrumentalities for feeding a film of stock to said collecting roll, a cutter arranged exteriorly of said roll, instrumentalities automatically actuated upon the collection of a predetermined amount of stock thereon, adapted to move said cutter against said cutter block to sever said stock, and means adapted to vary the line of contact between said cutter and said cutter block.

2. In a machine of the class described, a collecting roll, instrumentalities for feeding a film of stock to said collecting roll, a cutter arranged exteriorly of said roll, and instrumentalities automatically actuated by said roll and upon the collection of a predetermined amount of stock thereon to move said cutter to sever said stock.

3. In a machine of the class described, a collecting roll, instrumentalities for feeding a film of stock to said collecting roll, a cutter frame pivotally mounted on said roll, a cutter arranged on said frame with its cutting edge disposed toward said roll, means on said roll adapted to be connected with said cutter frame to rock the same, means actuated upon the collection of a predetermined amount of stock on said collecting roll to operatively connect said frame and said frame rocking means, and means to move said cutter on said frame during the rocking movement thereof, to sever the stock on said roll.

4. In a machine of the class described, a collecting roll, instrumentalities for feeding a film of stock to said collecting roll, a cutter frame, means to move said cutter frame, a cutter arranged on said cutter frame, and means rendered effective by the movement of said frame adapted to move said cutter relatively thereto to sever said stock.

5. In a machine of the class described, a collecting roll, instrumentalities for feeding a film of stock to said collecting roll, a cutter frame pivotally mounted on said roll, a cutter carried by said frame, means to impart a pivotal movement to said frame, and means rendered effective by the pivotal movement of said frame adapted to operate said cutter to sever said stock.

6. In a machine of the class described, a collecting roll, instrumentalities for feeding a film of stock to said collecting roll, a cutter frame pivotally mounted on said collecting roll, a cutter arranged on said frame, means on said roll adapted to be connected with said cutter frame to move the same circumferentially of said collecting roll, means actuated upon the collection of a predetermined amount of stock on said collecting roll for operatively connecting said frame and said frame moving means, means to move said cutter on said frame during the circumferential movement thereof to sever the stock on said roll, and means adapted to automatically disconnect said frame and said rocking means subsequently to the severing of said stock.

7. In a machine of the class described, a collecting roll, a cutter frame pivoted to rock about said roll, a cutter mounted on said frame, an abutment on said roll, means to operatively connect said abutment with said cutter frame to rock said frame, and means rendered effective by the rocking of said frame adapted to move said cutter against the periphery of said roll.

8. In a machine of the class described, a collecting roll, instrumentalities for feeding stock to said roll, a cutter arranged exteriorly of said roll, an abutment on said collecting roll, means rendered active by the collection of a predetermined amount of stock on said roll adapted to operatively connect said abutment with said cutter to move said cutter circumferentially of said roll, means rendered effective by the circumferential movement of said cutter adapted to operate said cutter to sever said stock, and means rendered effective by said circumferential movement of said cutter adapted to disconnect said cutter frame from said abutment.

9. In a machine of the class described, a collecting roll, instrumentalities for feeding stock to said roll, a cutter arranged exteriorly of said roll, an abutment on said collecting roll, means rendered active by the collection of a predetermined amount of stock on said roll adapted to operatively connect said abutment with said cutter to move said cutter circumferentially of said roll, means rendered effective by the circumferential movement of said cutter adapted to operate said cutter to sever said stock, and means rendered effective by said circumferential movement of said cutter adapted to disconnect said cutter frame from said abutment.
stock to said roll, a cutter frame pivoted to rock about the axis of said roll, a cutter mounted on said frame, an abutment on said roll, a latch on said cutter frame adapted to be engaged by said abutment to rock said cutter frame, means adapted to normally retain said latch out of engagement with said abutment, instrumentalties operated by the collection of a predetermined amount of stock on said collecting roll to move said latch retaining means to release said latch, and instrumentalties arranged along the path of movement of said cutter adapted to operate said cutter to sever and strip said stock from said roll.

10. In a machine of the class described, a collecting roll, instrumentalties for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to said roll, and means rendered effective by the collection of a predetermined amount of stock on said roll adapted to move said cutter bar longitudinally relatively to said roll, and means rendered effective by said longitudinal movement of said cutter bar adapted to move said cutter bar and said cutter toward said roll whereby said stock may be severed.

11. In a machine of the class described, a collecting roll, instrumentalties for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to said roll, and instrumentalties rendered effective by the collection of a predetermined amount of stock on said collecting roll, adapted to move said cutter circumferentially, longitudinally of and laterally toward said collecting roll to sever the stock collected by said roll.

12. In a machine of the class described a collecting roll, instrumentalties for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to said roll, instrumentalties rendered effective by the collection of a predetermined amount of stock on said roll adapted to move said cutter circumferentially in one direction relatively to the periphery of said collecting roll, means to move said cutter longitudinally of said roll, and means to move said cutter laterally relatively to said roll during said circumferential movement to sever the stock collected thereby, said cutter adapted to be moved by its own weight circumferentially relatively to said roll and in an opposite direction to said first mentioned circumferential movement.

13. In a machine of the class described, a collecting roll, instrumentalties for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to said roll, means rendered effective by the collection of a predetermined amount of stock on said roll adapted to operatively connect said cutter with said roll to move said cutter circumferentially of said roll in one direction, means to move said cutter laterally relatively to and into contact with said roll during said circumferential movement, to sever the stock collected by said roll, means to move said cutter during said circumferential movement to partially withdraw the same from said roll, means rendered effective by said circumferential movement to disconnect said cutter from said roll, whereby said stock will be stripped therefrom, and means to return said cutter to its normal position.

14. In a machine of the class described, a collecting roll, instrumentalties for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to said roll, means rendered effective by the collection of a predetermined amount of stock on said roll adapted to operatively connect said cutter with said roll to move said cutter circumferentially of said roll in one direction, means to move said cutter during said circumferential movement to partially withdraw the same from said roll, means rendered effective by said circumferential movement to disconnect said cutter from said roll, whereby said stock is stripped therefrom, said cutter adapted to be returned by its own weight to its normal circumferential position, and means rendered effective by the return movement of said cutter adapted to completely withdraw said cutter from said roll.

15. In a machine of the class described, a collecting roll, instrumentalties for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to said roll, a cutter block integral in the rim of said roll, an abutment secured to said roll at a predetermined circumferential distance from said block, a cutter arranged exteriorly of said roll with the cutting edge thereof directed toward said roll, means rendered effective by the collection of a predetermined amount of stock on said roll, to operatively connect said cutter with said abutment, whereby a movement circumferentially of said roll will be imparted to said cutter, and means to move said cutter toward and away from said cutter block during said circumferential movement to sever the stock on said roll.

16. In a machine of the class described, a collecting roll, instrumentalties adapted to rotate said roll and to feed stock thereto, abutments on said roll, latches pivoted on said frame adapted to be rocked by said abutments with said roll, latches pivoted on said frame adapted to be engaged by said abutments respectively, to rock said frame, fingers to normally withhold said latches from engaging said abutments, means actuated by the collection of a predetermined amount of stock.
on said roll to release said latches, a cutter bar arranged on said frame longitudinally of said roll adapted to be oscillated on said frame toward and away from the periphery of said roll, a cutter mounted on said cutter bar with its cutting edge directed toward said roll, and a cam adapted to oscillate said cutter bar during the movements of said frame to sever and strip said stock from said roll.

17. In a machine of the class described, a collecting roll, instrumentalities for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to the periphery of said roll, means adapted to impart a movement to said cutter circumferentially of said roll in one direction, a cam adapted to operate said cutter during said circumferential movement to sever the stock on said roll, said cutter adapted to be moved circumferentially of said roll in an opposite direction to said first circumferential movement by the weight of said cutter after said stock has been severed, and a cam to withdraw said cutter from said roll during said latter circumferential movement.

18. In a machine of the class described, a collecting roll, instrumentalities for feeding stock to said roll, a cutter arranged exteriorly of and adjacent to the periphery of said roll, means adapted to impart a movement to said cutter circumferentially of said roll in one direction, a cam adapted to operate said cutter during the first part of said circumferential movement, toward and against said roll to sever the stock thereon, a second cam adapted to move said cutter during the latter portion of said circumferential movement to partially withdraw said cutter from said roll, said cutter adapted to be moved circumferentially of said roll in an opposite direction to said first circumferential movement by its own weight, and a cam to entirely withdraw said cutter from said roll during said latter circumferential movement.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES PERKINS.

Witnesses:
CHARLES G. GOODING,
SYDNEY E. TAFT.