

E. P. NICHOLS.
LEATHER EVENING AND GRADING MACHINE.
APPLICATION FILED JULY 15, 1909.

1,058,623.

Patented Apr. 8, 1913.

4 SHEETS—SHEET 1.

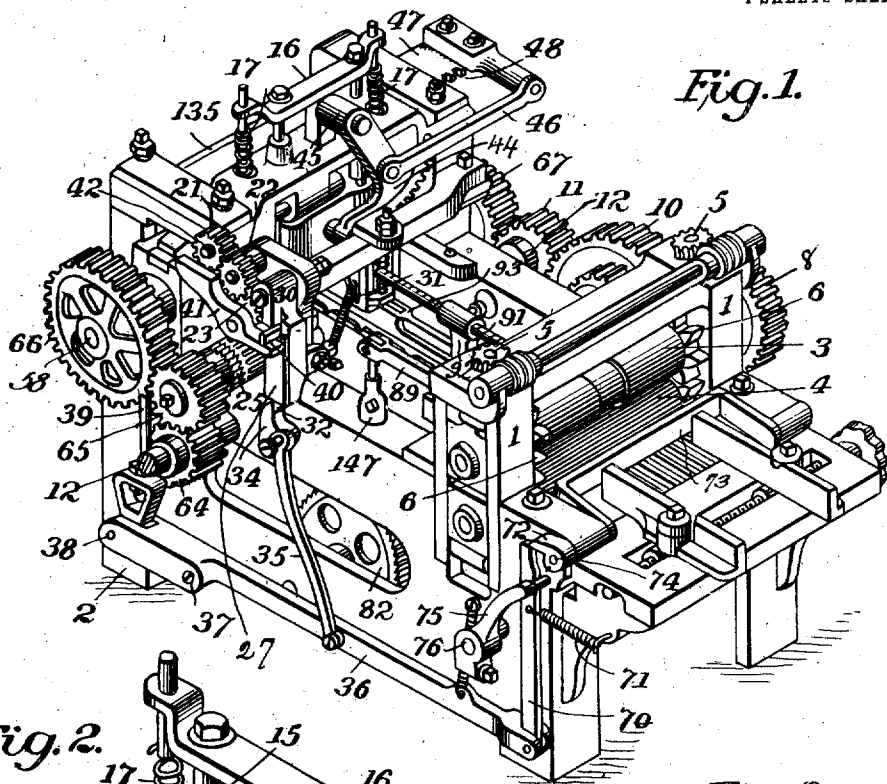


Fig. 1.

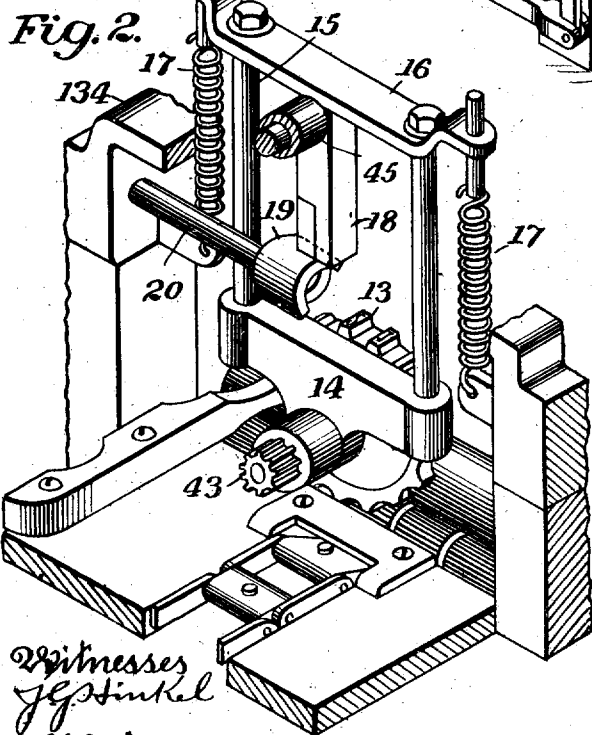


Fig. 2.

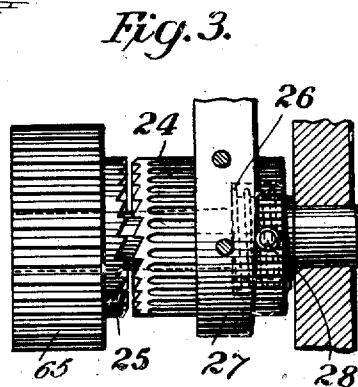


Fig. 3.

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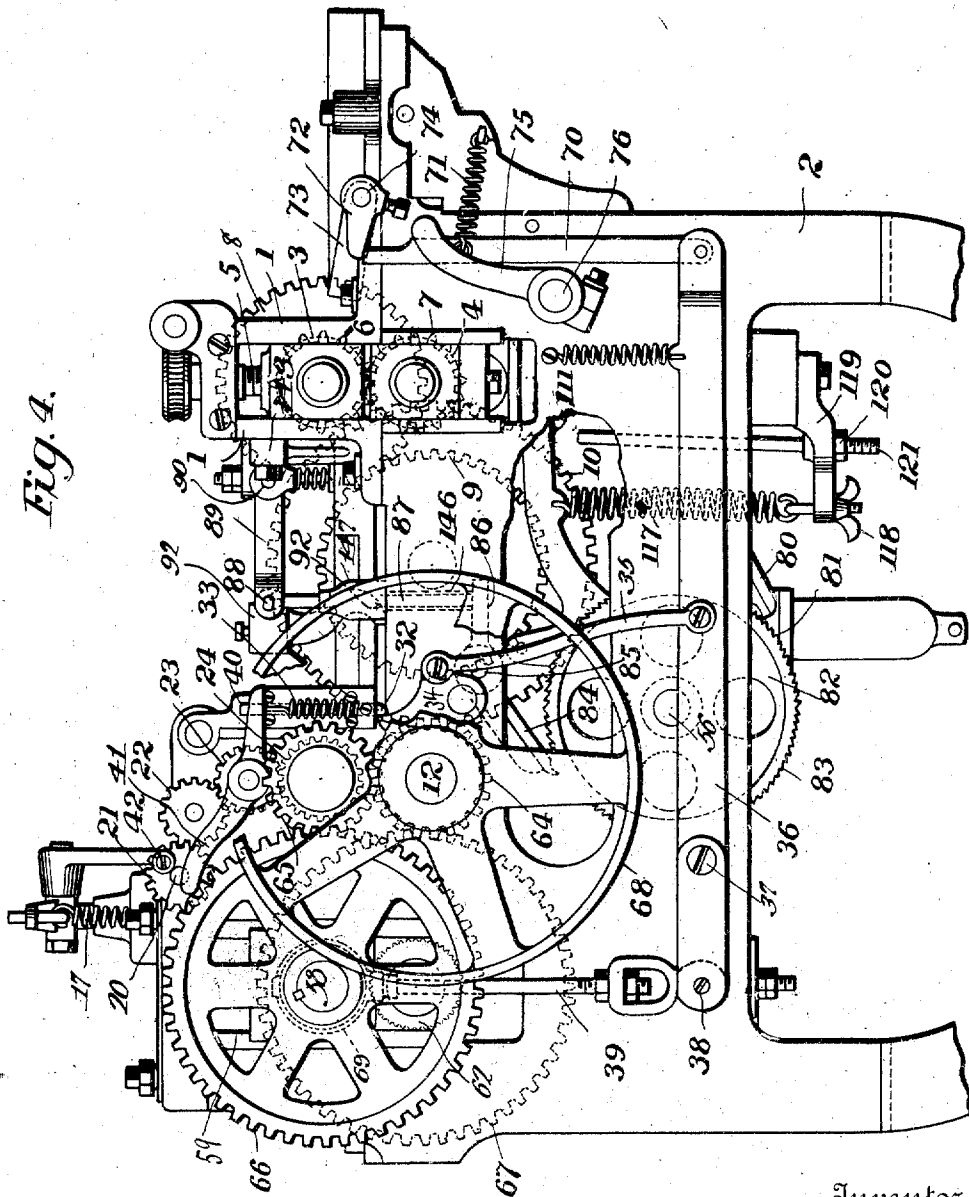


Fig. 4.

Witnesses
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B. B. Burt

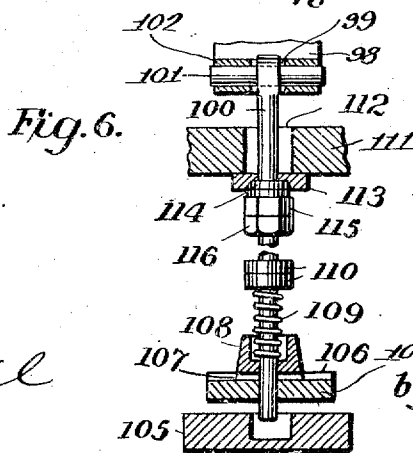
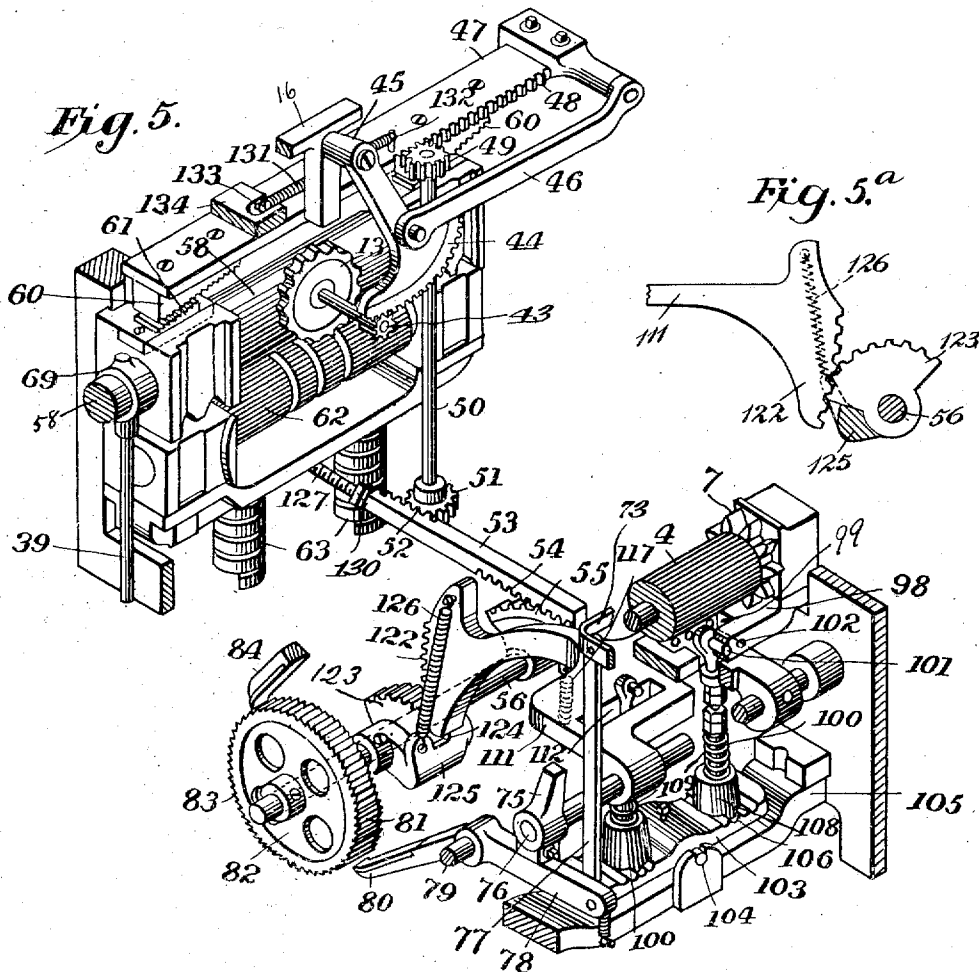
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4 SHEETS-SHEET 3.



Witnesses
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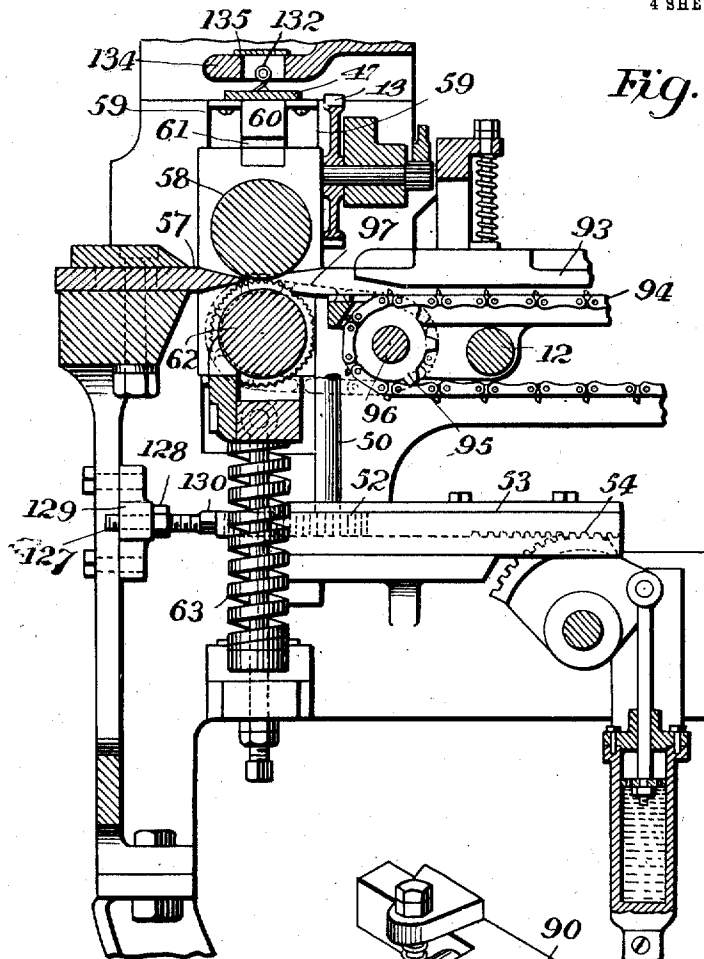


Fig. 7.

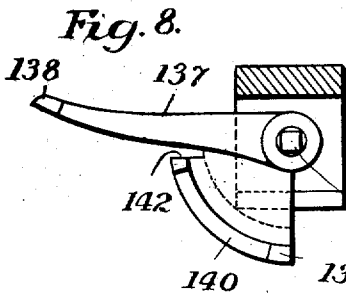


Fig. 8.

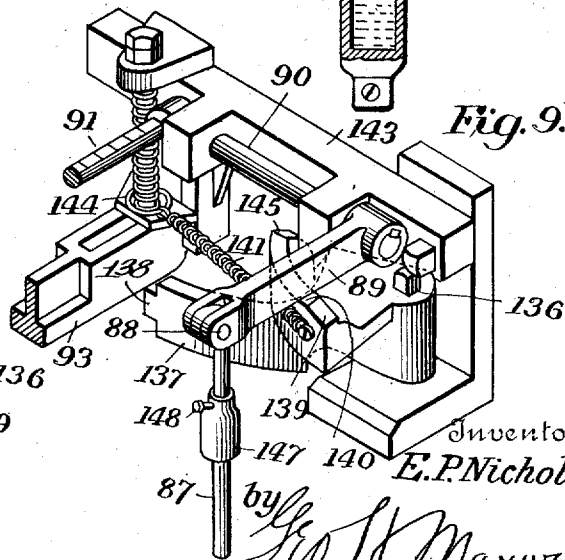


Fig. 9.

Witnesses

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UNITED STATES PATENT OFFICE.

ELMER P. NICHOLS, OF MANCHESTER, NEW HAMPSHIRE, ASSIGNOR TO LACENE MANUFACTURING COMPANY, OF MANCHESTER, NEW HAMPSHIRE, A CORPORATION OF MAINE.

LEATHER EVENING AND GRADING MACHINE.

1,058,623.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed July 15, 1909. Serial No. 507,728.

To all whom it may concern:

Be it known that I, ELMER P. NICHOLS, a citizen of the United States, residing at Manchester, in the county of Hillsboro and State of New Hampshire, have invented an Improvement in Leather Evening and Grading Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This machine is an improvement on the evening and grading machines of my previous patents and applications, the main constructional details of the machine herein shown being the same as in my application Ser. No. 418,008 filed Feb. 27, 1908, to which I have applied the improvements which constitute the present invention, which aims to secure still greater delicacy and accuracy of marking and evening the leather and greater precision and range of usefulness.

In connection with the feeler mechanism I have provided greater freedom of thinness-detecting movement whereby the stock is felt of more accurately and delicately at its edges and whereby there is less tendency to compress or roll down and flatten the stock. To this end, instead of having a heavy central balancing spring whose entire resistance must be overcome by the leather when operating the feeler mechanism, I provide two considerably lighter springs arranged to operate separately on and adjacent the opposite ends of the feeler roll so that much less pressure is applied to the leather, and I provide also means for adjusting laterally the feeler posts or rods which respond to the feeler roll, so that said posts may come as nearly as possible vertically beneath the edges of the stock being felt of. Also these posts are mounted on an equalizing lever or rocker plate which tilts in response to the varying tilting movements of the feeler roll and thereby permits the posts and feeler mechanism to respond with extreme delicacy and freedom of movement. This plate also equalizes the pressure on the stock so as to prevent getting more pressure at one edge than at the other. The foregoing mechanism adapts the machine to all widths and kinds of stock, so that it will grade, for instance, men's soles, women's soles, and counters, all with the same accuracy. In connection with the transmission mechanism, I have provided means whereby exactly the

same extent of movement for a given variation of thickness is transmitted to the grading mechanism irrespective of whether extremely thick stock or extremely thin stock is being graded. In connection with the grading mechanism, I have provided means for preventing the cam stops or stepped inclines of the evening mechanism from coming together when at rest, thereby eliminating their liability of sticking or lagging, and hence interfering with the proper transmission of feeler determinations.

Other improvements of a more minor character will appear in the course of the description.

In the drawings, in which I have shown a preferred embodiment of the invention, Figure 1 is a perspective view of the complete machine; Fig. 2 is a similar view of a portion of the grade-marking mechanism; Fig. 3 is a detail in front elevation of a portion of the tripping mechanism of the grade marker; Fig. 4 shows the machine in side elevation; Fig. 5 is a view similar to Fig. 1, largely broken away to show certain novel constructional details; Fig. 5^a is a sectional detail of a portion of the gaging mechanism; Fig. 6 is a transverse sectional view showing in side elevation one of the feeler posts, the adjacent parts being shown in vertical section taken longitudinally of the machine; Fig. 7 is a central longitudinal vertical section of the rear end of the machine; Fig. 8 is a plan view showing a special tripping or setting mechanism; and Fig. 9 is a perspective view of the special tripping or setting mechanism.

As already stated, my improvements are herein shown as applied to the machine of my copending application Ser. No. 418,008, and therefore it will be unnecessary to do more than to mention the constructional details of said machine in general, as they are more fully shown explained and claimed in said application.

Mounted in vertical standards 1 of the frame 2 are feed rolls 3, 4, the former held in positive adjustment by screws 5 and the latter constituting a feeler roll or work-member for engaging the stock, being freely movable vertically in response to the varying thicknesses of the leather pieces felt of, said feeler roll being positively driven by pinions 6 engaging its pinions 7, made with long teeth to permit said vertical movement.

The pinions 6 are on the shaft of the upper feed roll which is rotated by a gear 8 in mesh with a gear 9 whose shaft is driven by a gear 10 engaged by a pinion 11 on the main shaft 12. At the rear of the machine is the grading mechanism, *i. e.*, the mechanism for marking and evening the leather. The marking mechanism comprises a marking wheel or die 13 journaled in the lower cross bar 14 of a carrying frame whose side supports 15 are connected by a top cross bar 16 normally held under tendency to move downward by springs 17 and provided with a lifting post 18 engaged by a tripping cam 19 on a shaft 20 connected by a train of gears 21, (on the end of the shaft 20) 22, 23, and 24 with a clutch 25 on the shaft of the gear 24, said gear 24 and its clutch end being normally held back against the forward pressure of a spring 26 by a retracting cam plate 27 which engages for this purpose a stud 28 projecting radially from the gear 24, see Fig. 3, said cam plate being pivoted at 30, Fig. 1, on the frame of the machine and normally held by a spring 31 in position to maintain engagement with said stud 28, all as more fully shown, explained and claimed in my copending application Serial No. 657,748 (being a division of Serial No. 219,755). In the plate 27 is mounted a latch 32 held downward (by a spring 33) in engagement with a dog 34 actuated by a link 35 and lever 36 pivoted at 37 to the frame and at 38 to a rod 39, said latch having a projecting upper end 40 overlying the adjacent end of a lever 41 whose opposite end is actuated at desired times by a roll 42 on the gear 21, all as more fully shown and described in my application Ser. No. 418,008 and in the division thereof, Ser. No. 686,919, where the same is duly claimed. The die 13 has at the opposite end of its shaft an actuating pinion 43 rotated by a toothed sector 44 pivotally supported at 45 on the carrying frame of said die and connected by a link 46 to a slide plate 47 provided with rack teeth 48 on its front edge engaged by a pinion 49 at the upper end of a shaft 50 provided at its lower end with a pinion 51 engaging a rack 52 of a rack bar 53 provided at its opposite end with a rack 54 actuated by a gear 55 fast on a shaft 56 of the transmission mechanism. The evening mechanism comprises a knife 57, an adjustable gage roll or pressure roll 58 freely movable vertically in ways 59, limiting cam-stops or stepped wedges 60, 61, the former depending from the plate 47, and a lower feed roll 62 pressed upwardly by springs 63 to hold the stock hard against the gage roll 58 while the leather is being skived. The upper roll 58 is driven from the main shaft 12 by gears 64, 65, 66, on one side of the machine and the lower roll 62 by gears 11, 65 67, on the opposite side of the machine,

(and gear 67 being fast with 62) from power applied to a belt pulley 68 on said main shaft. The shaft of the upper roll 58 is connected by a loose strap 69 to the rod 39 of the lever 36, whose opposite end carries a lifter and trip bar 70 normally held by a spring 71 beneath an arm 72 of the gate 73 which is pivoted at 74 and said trip bar 70 is tripped at the proper moment as will be presently explained, by a lever 75 fast on the outer end of a shaft 76.

I will now describe the setting mechanism or setting portion of the transmission mechanism. The gate 73 is operated and permitted to operate by this trip bar 70, so as to operate a rod 77 pivoted thereto at one end and at its opposite end to a lever 78 pivoted at 79 to the frame of the machine and actuates a dog 80 to engage the takeup ratchet teeth 81 of a ratchet wheel 82 which is also provided with an oppositely extending set of ratchet teeth 83 to be engaged by a dog 84 pivoted at 85 to the frame of the machine and engaged at its rear end 86 by a trip or plunger-like finger 87 pivoted at 88 to a crank arm 89 extending rigidly from a rock shaft 90 on whose arm 91 is adjustably mounted a shoe or foot 92 in the path of the stock being handled, said stock being fed along beneath a presser bar or plate 93 by a feed chain 94 driven by a sprocket wheel 95 on a shaft 96 which is driven by a sprocket chain 97 from the shaft of the under roll 62.

The foregoing mechanism is all fully described in my aforesaid application Serial No. 418,008 above, and duly claimed therein and in other preceding applications therein referred to.

The feeler roll 4, (which preferably also constitutes part of the feeding mechanism) or equivalent member which extends transversely across the stock throughout the width thereof, has, secured to its opposite journal blocks, a transverse bridge or yoke 98, which, in the preferred construction, is provided with vertical slots 99 in which are mounted feeler posts or rods 100, one at each end of said bridge or yoke. Each post is supported on a pin 101 in holes 102 in said yoke, a series of said holes being provided so as to permit the feeler post to be shifted laterally as may be required for different widths of stock, the idea being to get the posts as nearly in true vertical alinement beneath the edges of the stock as is practicable. Said posts are supported at their lower ends on a pivoted plate or rocker lever 103 pivoted at 104 on a cross brace or stationary beam 105 of the machine.

The rocker lever or plate 103 is provided at each end with a series of transverse grooves 106 adapted to receive a depending tooth or V-shaped projection 107 of a cup-shaped support or rest 108 which supports the post 100 yieldingly by means of a spring

109 whose lower end sets in the cup of the part 108 and whose upper end rests against adjusting nuts 110 the lower end of said post passing through holes provided therefor in the parts mentioned. Thus if the machine is to be used on wide stock such as men's soles, the upper and lower ends of the posts 100 are adjusted laterally toward the sides of the machine, whereas if the machine is to be used on extremely narrow stock such as counters, these posts are adjusted toward each other as far as possible, and if the machine is to be used on stock of medium width such as women's soles, the posts will be adjusted to an intermediate position, the upper ends being adjusted by moving the pins 101 in the holes 102, the slots 99 permitting the posts themselves to shift as required by their various positions, and the lower ends being adjusted by moving the rests or socket members 108 correspondingly in their holding grooves 106. The toe or V-shaped projections 107 cooperate with the holding grooves 106 of the pivoted or rocking plate or lever 103 in permitting free rocking movement of the plate and hence vertical movement of the posts in opposite directions with minimum resistance. As the feeler roll is depressed at one end by a thick edge of the stock and permitted to rise at the other end by an opposite thin edge, the post 100 adjacent the first mentioned end of the feeler roll is depressed, while the other post rises (or rather follows the stock according to the varying thickness of the latter), the reciprocal longitudinal movement of the posts mutually aiding each other. The rocking plate or lever 103 maintains absolute uniformity as to each post under all conditions, so that one spring cannot attain greater tension than the other. Also as the variations in tension in one spring are transmitted to the other spring by the rocking connection between the two, it follows that lighter springs may be employed, for, as one post is depressed by a thick edge of stock thereby tending to compress its spring 109, said compression immediately lowers or tends to lower the adjacent end of the rocking lever 103, thereby raising the opposite end of said lever and increasing the tension of the spring 109 at said opposite end until the two springs are exactly the same in tension. It commonly happens that stock is thinner at one edge than at the other so that the said two springs tend positively to aid the movements of the two posts in opposite directions. The tension of said springs may be maintained uniform throughout a long period of use by proper adjustment of the nuts 110. Cooperating with said posts is a relatively heavy transmission lever 111 (which, for convenience of terminology, may be said to constitute the forward end of the transmission or gaging mechanism, which ends rearward with the rack 48) fast on the rock shaft 76 (so as thereby to operate lever 75 as soon as the stock has entered the machine) and slotted at 112 in vertical alinement with the slots 99 of the yoke 98. The posts 100 pass through these slots 112 and are provided beneath said slots with washers or supporting plates 113 having a socket or cup-shaped lower face engaged by a ball projection 114 of an adjusting nut 115 held positively and accurately in desired adjustment by a set nut or check nut 116, so that the height of said transmission lever is positively and accurately determined or controlled by and in accordance with the position of whichever post is higher at any given instant. In other words, whenever the feeler roll 4 rises at one end in feeling a thin spot in the adjacent edge of the stock being engaged thereby, the spring of the feeler post 100 which is directly under said thin spot raises its post and thereby, through the engagement of the supporting plate 113 with the lever 111 raises said lever to a corresponding extent, the supporting plate 113 of the opposite post being then out of contact with said lever 111 in case the piece of stock proves to be thicker at that edge than at the edge containing the thin spot mentioned. Not only is the feeling-engagement with the stock effected against the under side of the stock, but also the transmission mechanism which extends from the feeler mechanism to the rear end of the machine is also located within the frame and beneath the plane of movement of the leather piece, as distinguished from being mainly above said plane of movement, as in my previous machines. One of my objects has been to arrange the mechanism beneath the plane of movement of work so that the latter would be as freely exposed as possible beneath the critical observation of the operator. In order to give instant responsiveness and permit the feeler detections to be rapidly transmitted, a spring 117 is provided, which operates, in addition to the weight of the lever 111, to compel said lever to follow the movements of the feeler posts instantly and accurately, said spring being adjustably secured at 118 to a stationary bracket 119. Adjustably secured at 120 in said bracket is also a rod 121 which extends upwardly vertically beneath the lever 111 so as to limit the downward movement of said lever. This is to enable the user of the machine to limit the grading of the stock to any given weight or thickness desired. For instance, in some factories the rule may be never to employ a sole more than twelve irons thick, and yet there will probably be occasionally a sole in each lot that will be fourteen or fifteen irons thick, so that, if left to itself, the machine would so grade said sole to its true thick-

ness, and this would be prevented by the maximum-thickness-limiting means 121 which, being set to twelve irons, would cause the skiving mechanism to remove all the surplus thickness of the leather and grade it down to twelve irons notwithstanding the greater movement of the feeler mechanism.

The transmission lever 111 terminates in a downwardly bent arm or neck having a vertically arranged toothed sector 122 at its rear vertical edge in mesh with a sector gear 123 loose on the shaft 56. This loose gear 123 is in position to strike against a stop 124 of the front end or projection of a yoke 125 whose opposite portions are made fast on the shaft 56 so as to embrace said sector 123 and maintain it in free moving alinement with the gear 122. A spring 126 normally holds said gear 122 and stop 124 toward each other, and therefore tends to hold the shaft 56, gear 55, rack bar 53 and connected train of mechanism, in unvarying normal relation when the machine is at rest. By having the toothed arrangement 122, 123, whereby a uniform movement is given to the shaft 56 for any given increment or decrement of measurement, irrespective of whether the particular piece of stock being measured happens to be very thin or very thick, the error of measurement in the machine of my previous application Ser. No. 418,008 is eliminated and the machine is made equally accurate for all thicknesses. The gear 122 constitutes virtually a portion of a wheel, as does also the sector 123, so that their measuring capacity is not affected by their preliminary movement, whether said movement is considerable because of a thick piece of stock or is slight because of a thin piece of stock, because, at the end of this initial movement (when the stock is getting in position between the rolls 3, 4), the engaging teeth have always the same relation to their pivotal centers (by reason of the fact, as stated, that they are virtually portions of wheels), and hence measure correctly and accurately any given variation of thickness in the piece of stock being measured; thereby eliminating the inaccuracy or distortion of measurement in my aforesaid previous machine, in which a crank-link-lever gaging connection was employed, so that the relative angular position of the parts with relation to their centers of movement varied necessarily according to whether a thick piece of stock or a thin piece of stock were being measured. A bolt 127 held in accurate adjustment by a check nut 128 in a bracket 129 at the rear of the machine so that its head 130 engages the rear end of the rack bar 53 serves to hold the pinion 51 turned to such a position as to prevent the stepped inclines 60, 61, from coming together when work is out of the machine. Thus when stock enters the ma-

chine said inclines are given their initial starting movement when out of contact with each other and hence offer minimum resistance to said starting movement when stock is entered between the rolls 3, 4. The stop-bolt 127 also normally maintains the gear 123 and stop 124 slightly separated so that when the piece of stock is first put into the machine the feeler roll 4 may receive its initial depression independently of such resistance as is subsequently offered by the shaft 56 and train of mechanism therefrom back to the grading mechanism (this stop feature 127 not being herein claimed as it is duly claimed in my application Ser. No. 418,008). The plate 47 and its stepped inclines or cam wedges 60 are held under tendency to move to the left Fig. 5 by a spring 131 secured at 132 to said plate and at 133 to a stationary part 134 of the frame of the machine, said spring being protected by a cover 135 on the part 134. This spring tends to move the parts in the opposite direction from the corresponding spring in my last mentioned application, thereby performing the same function of preventing lost motion in the train of transmission mechanism and performing the additional office of coöperating with the springs 126 and 117 in materially decreasing the resistance offered to the feeler mechanism by the transmission mechanism, so that thereby the feeler mechanism and the machine in general are rendered more sensitive and easier in movement and there is less tendency to squeeze and distort the leather as it enters the machine. Referring now to Figs. 8 and 9, which show an additional setting means for short stock, like taps, it will be seen that I have pivoted at 136 a tripping lever 137 having a projecting stock-engaging tongue or portion 138, a cam surface 139 for lifting the crank arm 89, and a holding surface 140 for maintaining said arm lifted as the stock passes through the feeler mechanism. This arrangement is more sensitive and instant in action than the mechanism heretofore provided for this purpose. The tongue 138 is normally held by a spring 141 up to the rolls 3, 4, but not in contact therewith, being limited by the striking of the stop end 142 of the part 140 against the adjacent cross piece 143, so that said lever 137 is operated just as soon as the feeler mechanism has time to get the transmission mechanism into effective position, said lever 137 being then instantly engaged by the front end of the stock between said rolls 3, 4.

The cam 139 is short so as to lift the arm 89 and rod 87 at once upon the initial swinging movement of the lever 137, the parts being shown in Fig. 9 as having been operated by the stock. The holding surface 140 is long so as to retain the rod 87 in undisturbed lifted position while the stock is

passing forward, and while said stock if wide, is swinging the lever 137 a considerable distance so as to get said lever entirely out of its path. This feature of the machine is used ordinarily for grading taps, and when not in use (the shoe 92 being then relied upon) the spring 141 is unhooked from its holding ring 144 and the lever 137 is swung entirely around out from beneath the arm 89. An opposite beveled portion 145 is preferably provided at the inner end of the surface 140 to facilitate the inward swinging of the lever 137 when it is to be restored to its operative position as shown in Fig. 8, said surface 145 striking against and lifting the arm 89 while the parts are being swung inwardly to their operative position. The rod 87 is freely pivoted at 88 and guided in a hole 146 in the frame of the machine, and is provided with a weight 147 adjustably secured by a set screw 148 on said tripping rod 87, said weight 147 performing the office of a stop to limit the downward movement of the arm 89 and hence of the rod 87 so as to prevent the dog 84 being moved too far, and also performing the office of a spring in compelling the arm 89 to move the dog 84 positively out of engagement with the ratchet wheel 82.

The operation of the machine, in general, is the same as fully set forth in my before-mentioned application Serial No. 418008, wherein the various features thereof are duly claimed, and it will therefore be sufficient, at this point, to state the operation very briefly. As the gate 73 is raised (by the escape of the graded piece of stock from the outgoing end of the machine), the operator feeds in the next piece of stock, which is to be graded, which enters between the rolls 3, 4. The first portion of the separating movement of said rolls causes the toothed sector 123 to take up the lost motion which has previously existed between said sector and the stop 124 of the casting 125, so that, during the further separation and feeling movements of the feeler mechanism, the transmission mechanism is in position to transmit accurately all the required movement of the feeler mechanism. Meanwhile the setting mechanism has set the dog 84 into operative engagement with the ratchet 83 so as to take up each increment of thinness-measurement experienced by the feeler mechanism as the successively thinner spots in the leather piece are detected by the latter, said ratchet and dog continuing to respond thus until the stock has passed clear of the gate 73, which thereupon falls and causes the dog 80 to lock said ratchet, and hence the transmission mechanism, against further thinness-measurement movement. For instance, if taps are being graded, the member 137 is swung around into operative position so that its small tongue portion 138

is close to the bight of the rolls 3, 4 ready to be engaged by the front end of the tap as the latter is being felt of by the feeler roll 4, and hence the initial forward movement of the tap operates to swing said member 137 so as to raise the arm 89 and trip 87 of the setting mechanism and thereby permit the dog 84 to engage the ratchet as stated. On the other hand, if soles, for instance, are being graded and hence it is not desired that the forward portions shall be taken account of, the member 137 is swung back to its inoperative position and the shoe or member 92 of the setting mechanism is relied upon to raise the arm 89 and trip 87, etc. as stated. The feeler mechanism, *i. e.* the mechanism at the front of the machine which feels of the leather piece and delivers to the ratchet 83 of the transmission mechanism the successive increments of thinness detected in the leather piece, yields to the various unevennesses of the leather piece as the latter moves between the rolls 3 and 4, the yielding, in the preferred embodiment of my invention shown in the machine of the drawings, taking place in the roll 4 which moves up and down in response to the variations of thickness of the leather piece, and thereby, through the bridge or yoke 98, correspondingly moves the feeler posts 100, and their nuts 115 positively move the lever 111 (held by its spring 117 in constant engagement with said posts) whose sector 122 actuates the sector 123, thereby rocking the shaft 56 of the transmission mechanism or gaging mechanism, and, through the train of mechanism 55, 53, 51, 50 and 49, actuates the grading mechanism. The grading mechanism, *i. e.* the mechanism at the rear of the machine which is capable of being regulated or adjusted so as to mark and skive the leather piece in accordance with the thinnest spot found by the feeler mechanism, is thus caused to respond accurately to the successively thinner measurements detected, as said successively thinner measurements are taken up by the dog 84 and ratchet 83 (the latter obviously responding only to measurements of increasing thinness of stock and not to any measurements of increasing thickness). The transmission mechanism, having been set, thereafter operates by engagement of the pinion 49 with the teeth of the slide plate 47 of the grading mechanism to regulate the latter in response to the feeler determinations of the feeler mechanism on the stock. The slide plate 47 operates simultaneously to position the die 13 through the parts 43, 44 and 46, and also to position the stepped inclines 60, so that when the stock is fed along by the chain 94 to the rolls 58, 62, the former can yield only to the extent permitted by the stepped inclines, the result being that the knife 57 skives off all the surplus leather required. At the same

time the die falls and marks the stock with the grade mark to which it is being evened by said knife, the tripping cam or lifter 19 being actuated by the train of gears 21-24 when the latter (the clutch member) is released by the swinging back of its cam plate by the dog 34 and connected parts 35, 36, 39, and 69 when the roll 58 is moved upwardly by the entrance beneath it of the piece of stock which is to be marked, as explained more at length in my aforesaid application Ser. No. 418,008.

As implied in the foregoing description and in the following claims, I am not limited to the specific mechanism of the preferred embodiment of my improvements shown in the machine of the drawings, except as otherwise required in certain of the more limited claims.

In the claims, I have used the words regulating means as a broad term to include the means or mechanism for accomplishing the governing, controlling, adjusting, or setting of the leather-engaging or grading mechanism. The knife and those parts which limit its operation on the stock constitute the evening mechanism (being one form of the stock grading mechanism), said evening mechanism consisting of means to cut away the undesired part of the leather and means definitely to limit, control or regulate the operation of said cutting means so that no more leather shall be cut away than is desired, said cutting means being herein shown as a knife and said limiting means being herein shown as consisting of a pressure roll to engage the stock and a graduated or cam stop in the form of a stepped wedge which definitely governs and limits the working position of said roll when the latter is controlling the stock with relation to the knife, said knife, roll and stop, which thus constitute the evening mechanism, cooperating to even the leather in response to and in accordance with the feeler mechanism, by which they are directly influenced or affected so as automatically to grade with reference to said feeler mechanism. In many respects, as will be evident from the claims, I consider my present invention as broadly new, and accordingly capable of a wide variety of mechanical embodiments without departing from the spirit and scope of the invention, although subordinate to my heretofore granted patents in this art. By the term grading means I denote any means for designating, as by marking, cutting, or any other way differentiating or classifying the different grades of stock, as fully explained in my patent No. 841,809.

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

1. In a machine of the kind described, a skiving knife for grading a piece of stock to

a predetermined even thickness, a gage roll movable toward and from said knife, stop devices for limiting the movement of said roll away from said knife, feeler mechanism for feeling of a piece of stock, transmission mechanism between said feeler mechanism and said stop devices for regulating the position of the latter in response to the feeler movements of the feeler mechanism, means for preventing said stop devices from contacting with each other when stock is not present between said roll and knife, a spring adjacent the rear end of said transmission mechanism tending to move said stop devices away from each other, and a spring adjacent the front end of said transmission mechanism for straining the parts of said transmission mechanism toward the feeler mechanism for preventing lost motion and increasing the sensitiveness of the feeler mechanism and the ease of movement of said feeler mechanism and transmission mechanism.

2. In a machine of the kind described, feeler mechanism, including a work member extending transversely of the machine in position to engage the stock from edge to edge of said stock, devices responsive to the movements of said member under the influence of said stock at the opposite edges thereof, a separate pressure-regulating spring for each of said devices, said devices being normally fixed but capable of adjustment toward and from each other in accordance with different widths of stock, and adjusting means for fixing said responsive devices in their said different adjustments, transmission mechanism, and stock grading mechanism automatically regulated by said transmission mechanism with relation to said feeler mechanism.

3. In a machine of the kind described, feeler mechanism, including a work member extending transversely of the machine in position to engage the stock from edge to edge of said stock, devices responsive to the movements of said member under the influence of said stock at the opposite edges thereof, and equalizing means separate from said work member connecting said devices for maintaining the pressure of said devices uniform on the stock at said opposite edges, transmission mechanism controlled by said devices, and stock grading mechanism automatically regulated by said transmission mechanism with relation to said feeler mechanism.

4. In a machine of the kind described, feeler mechanism, including a work member extending transversely of the machine in position to engage the stock from edge to edge of said stock, devices responsive to the movements of said member under the influence of said stock at the opposite edges thereof, and an equalizer in the form of a rocking plate supporting adjacent its ends

at the opposite sides of its pivot said responsive devices, transmission mechanism, and stock-grading mechanism automatically regulated by said transmission mechanism with relation to said feeler mechanism.

5 5. In a machine of the kind described, feeler mechanism, including a work member extending transversely of the machine in position to engage the stock at its opposite
10 edges, vertically movable feeler posts responsive to the movements of said member, and a rocking member connecting said posts for influencing the action of one with reference to the other, transmission mechanism,
15 and stock-grading mechanism automatically regulated by said transmission mechanism with relation to said feeler mechanism.

6. In a machine of the kind described, feeler mechanism, including a work member
20 extending transversely of the machine in position to engage the stock at its opposite edges, vertically movable feeler posts responsive to the movements of said member, a rock lever, and springs carried by said rock
25 lever in yielding engagement with said posts respectively, one at each end of said lever, transmission mechanism, and stock-grading mechanism automatically regulated by said
30 transmission mechanism with relation to said feeler mechanism.

7. In a machine of the kind described, feeler mechanism, including a work member extending transversely of the machine in position to engage the stock at its opposite
35 edges, vertically movable feeler posts responsive to the movements of said member, said posts being adjustable transversely of the machine toward and from each other, and a rock lever yieldingly connected ad-
40 jacent its opposite ends to said respective posts for influencing the action of one post with reference to the other post, transmission mechanism, and stock-grading mechanism automatically regulated by said trans-
45 mission mechanism with relation to said feeler mechanism.

8. In a machine of the kind described, the combination with stock-grading mechanism, of regulating means cooperating with said
50 grading mechanism for automatically regulating the latter, said means being controlled by the material to be graded and including feeler posts responsive to unevennesses of the stock, a spring yieldingly engaging each
55 post, and an equalizing rocker lever carrying said springs.

9. In a machine of the kind described, the combination with stock-grading mechanism, of regulating means cooperating with said
60 grading mechanism for automatically regulating the latter, said means being controlled by the material to be graded and including adjustable feeler posts responsive to unevenness of the stock, a spring yieldingly
65 engaging each post, and an equalizing rocker

lever carrying said springs, said posts being adjustable toward and from each other at their opposite ends for maintaining them in substantially vertical alinement with the edges of the stock being handled.

10. In a machine of the kind described, the combination with stock-grading mechanism, of regulating means cooperating with said grading mechanism for automatically
70 regulating the latter, said means being controlled by the material to be graded and including a transmission lever, independently movable feeler posts for actuating said lever, and spring equalizing means for each post
75 for influencing the action of one post with reference to the other. 80

11. In a machine of the kind described, the combination with stock-grading mechanism, of regulating means cooperating with said grading mechanism for automatically
85 regulating the latter, said means being controlled by the material to be graded and including a transmission lever, independently movable feeler posts for actuating said lever, and separate springs, one for each post,
90 maintaining said posts under yielding pressure toward the work.

12. In a machine of the kind described, the combination with stock-grading mechanism, of regulating means cooperating with said grading mechanism for automatically
95 regulating the latter, said means being controlled by the material to be graded and including a rotary ratchet to take up each increment of thinness detected in the stock, and actuating means for said ratchet includ-
100 ing mechanism for moving said actuating means with the same effective movement for any given increment of thinness measurement irrespective of whether the stock being
105 handled is thick stock or thin stock.

13. In a machine of the kind described, the combination with stock-grading mechanism, of regulating means cooperating with said grading mechanism for automatically
110 regulating the latter, said means being controlled by the material to be graded and including a rotary take-up ratchet to take up each increment of thinness detected in the stock, and actuating means for said ratchet
115 consisting of cooperating toothed gears, one responsive to unevennesses of the stock and the other engaged thereby and directly connected with said ratchet.

14. In a machine of the kind described, stock-grading mechanism, feeler mechanism, and gaging mechanism for transitting move-
120 ment from the feeler mechanism to the grading mechanism, said gaging mechanism including a series of relatively movable connected parts from the feeler mechanism to the grading mechanism, and spring means for preventing lost motion between said
125 parts, said spring means maintaining said parts under tension tending in a direction 130

toward said feeler mechanism from said grading mechanism.

15. In a machine of the kind described, the combination with stock-grading mechanism, of regulating means cooperating with said grading mechanism for automatically regulating the latter, said regulating means being controlled by the material to be graded and including stock-actuated setting means for rendering the regulating means responsive to the stock, comprising a controlling trip for the setting means, and a horizontally movable member having a part normally projecting in the path of the stock, and connecting means from said member to said trip for operating the latter when said member is moved by the stock.

16. In a machine of the kind described, feeler mechanism for feeling of a piece of stock, gaging mechanism operated by said feeler mechanism, and setting means actuated by said stock for setting said gaging mechanism, said setting means including a controlling trip therefor, and a horizontally swinging member for actuating said trip, having a part projecting normally into the path of the stock to be actuated by the latter.

17. In a machine of the kind described, feeler mechanism for feeling of a piece of stock, gaging mechanism operated by said feeler mechanism, and including a ratchet wheel and dog, and setting means including a vertically moving tripping device therefor, and an adjustable weight serving as a limiting stop and also as actuating means for throwing said tripping device into inoperative position.

18. In a machine of the kind described, grading mechanism to grade a leather piece, feeler mechanism cooperating therewith, and intervening transmission mechanism for adjusting the grading mechanism in accordance with the feeler mechanism, said transmission mechanism including means allowing lost motion, between relatively movable parts thereof, and requiring said movable parts, when the feeler mechanism is at rest, to be in the position to move with said lost motion when said feeler mechanism begins to operate, and arranged to have the lost motion taken up by the initial movement of the feeler mechanism when first engaging the leather piece, said transmission mechanism having its structural parts arranged for thereafter operating without lost motion.

19. In a machine of the kind described, feeler mechanism to feel of the stock, grading mechanism to grade the stock in accordance with the feeler mechanism, transmission mechanism connecting said two mechanisms and means to limit the grading of the stock to a predetermined range of grading.

20. In a machine of the kind described, feeler mechanism to feel of the stock, grad-

ing mechanism to grade the stock in accordance with the feeler mechanism, transmission means for regulating the grading mechanism with reference to the feeler mechanism, and adjustable means for limiting the grading of the stock to a maximum thickness.

21. In a machine of the kind described, feeler mechanism to feel of the stock, grading mechanism to grade the stock, transmission mechanism for regulating the latter in accordance with the former, and a rigid member adjustable with relation to the transmission mechanism for limiting the movement of the latter and thereby limiting the grading of the stock to a predetermined extent in accordance with said adjustment.

22. In a machine of the kind described, grading mechanism, including means for engaging the stock on its opposite sides while being graded, stop devices for limiting the distance of separation of said engaging means, a spring under normal tendency to move said stop devices in a direction to increase said distance, and mechanism responsive to unevennesses in the stock in the machine for automatically adjusting said stop devices in opposition to said spring.

23. In a machine of the kind described, grading mechanism for grading a leather piece, including an upper vertically movable gage roll, a lower movable roll, a fixed skiving knife operative between said rolls, stepped wedges for limiting the movement of the gage roll, feeler mechanism, transmission mechanism for adjusting one of said wedges with relation to the other in accordance with the feeler mechanism, a spring normally tending to move said adjustable wedge away from the other wedge, and means for maintaining said wedges out of contact with each other in the absence of work from the machine.

24. A machine of the kind described, having, in combination, a support against which a piece of stock may be gripped, a plurality of feeler posts, a pressure-regulating strip for each post, means for causing said stock to be gripped against said support with pressure transmitted from said posts, a skiving knife, and cooperating automatic mechanism for causing the stock to be skived to the thickness of the thinnest portion as determined by said posts.

25. A machine of the kind described, having, in combination, a support against which a piece of stock may be gripped, a plurality of feeler posts, a pressure-regulating spring for each post, said posts being adjustable toward and from each other for different sizes of stock, means for causing said stock to be gripped against said support and so held at least in part by pressure transmitted from said posts, a skiving knife, and co-

operating automatic mechanism for causing the stock to be skived to the thickness of the thinnest portion as determined by said posts.

26. A machine of the class described, having, in combination, a support against which a piece of stock may be pressed, a plurality of feeler posts, grading means for grading with reference to the thickness of the thinnest portion so gripped, and means adjacent the posts and independent of said grading means for causing said stock to be

gripped against said support with an increased pressure transmitted from said posts after the first engagement of the stock with said support.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ELMER P. NICHOLS.

Witnesses:

GEO. H. MAXWELL,
M. J. SPALDING.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

Corrections in Letters Patent No. 1,058,623.

It is hereby certified that in Letters Patent No. 1,058,623, granted April 8, 1913, upon the application of Elmer P. Nichols, of Manchester, New Hampshire, for an improvement in "Leather Evening and Grading Machines," errors appear in the printed specification requiring correction as follows: Page 7, lines 63-64, for the for the word "unevenness" read *unevennesses*; same page, line 122, for the word "transitting" read *transmitting*; and line 129, for the word "mantaining" read *maintaining*; page 8, line 113, for the word "strip" read *spring*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of May, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

operating automatic mechanism for causing the stock to be skived to the thickness of the thinnest portion as determined by said posts.

26. A machine of the class described, having, in combination, a support against which a piece of stock may be pressed, a plurality of feeler posts, grading means for grading with reference to the thickness of the thinnest portion so gripped, and means adjacent the posts and independent of said grading means for causing said stock to be

gripped against said support with an increased pressure transmitted from said posts after the first engagement of the stock with said support.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ELMER P. NICHOLS.

Witnesses:

GEO. H. MAXWELL,
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