Feb. 5, 1929. 1,700,978

L. A. COGSWELL

FLESHING AND GRADING MACHINE

Filed July 26, 1922 4 Sheets-Sheet 1

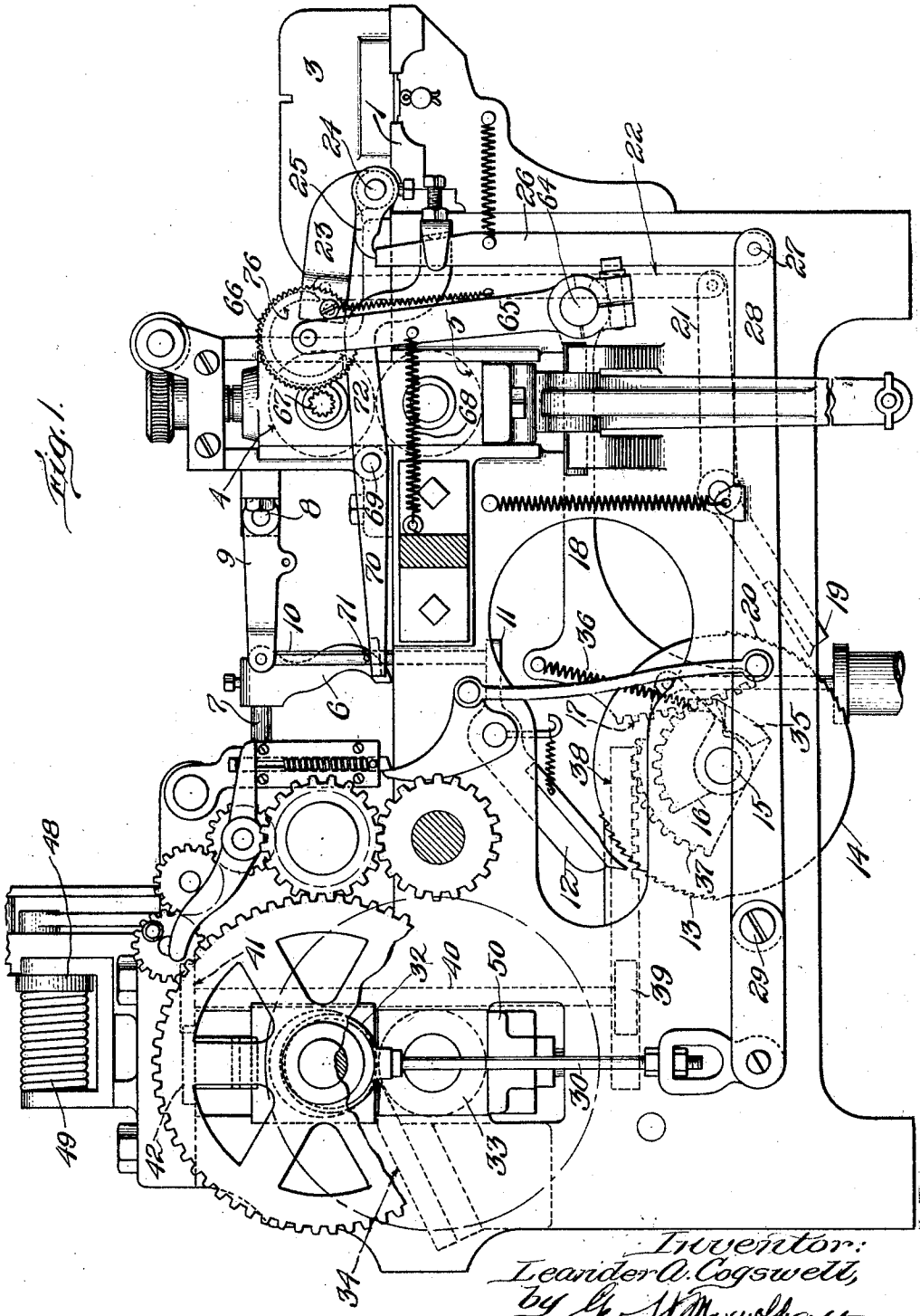


Fig. 1.

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Fig. 2.

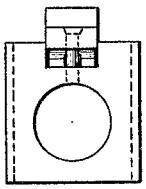


Fig. 3.

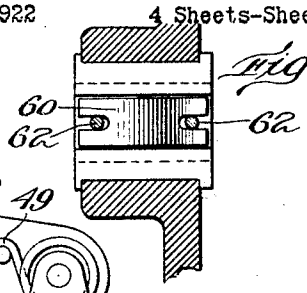


Fig. 4.

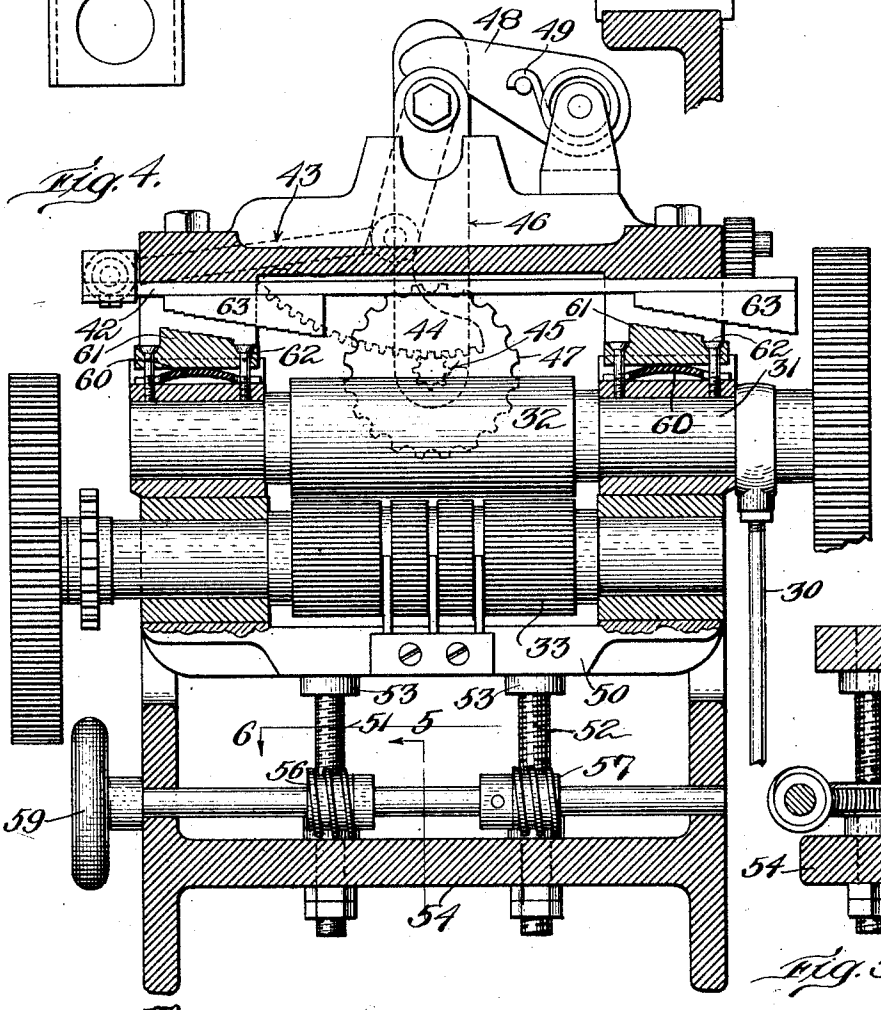
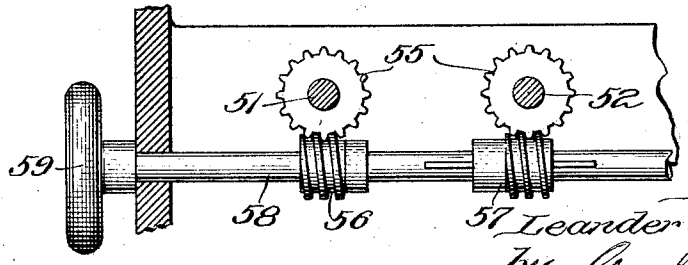


Fig. 5.

Fig. 6.



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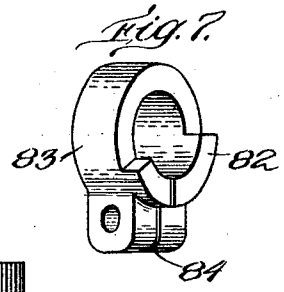
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L. A. COGSWELL

FLESHING AND GRADING MACHINE

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Fig. 7.



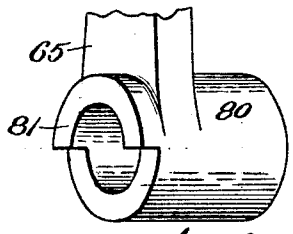
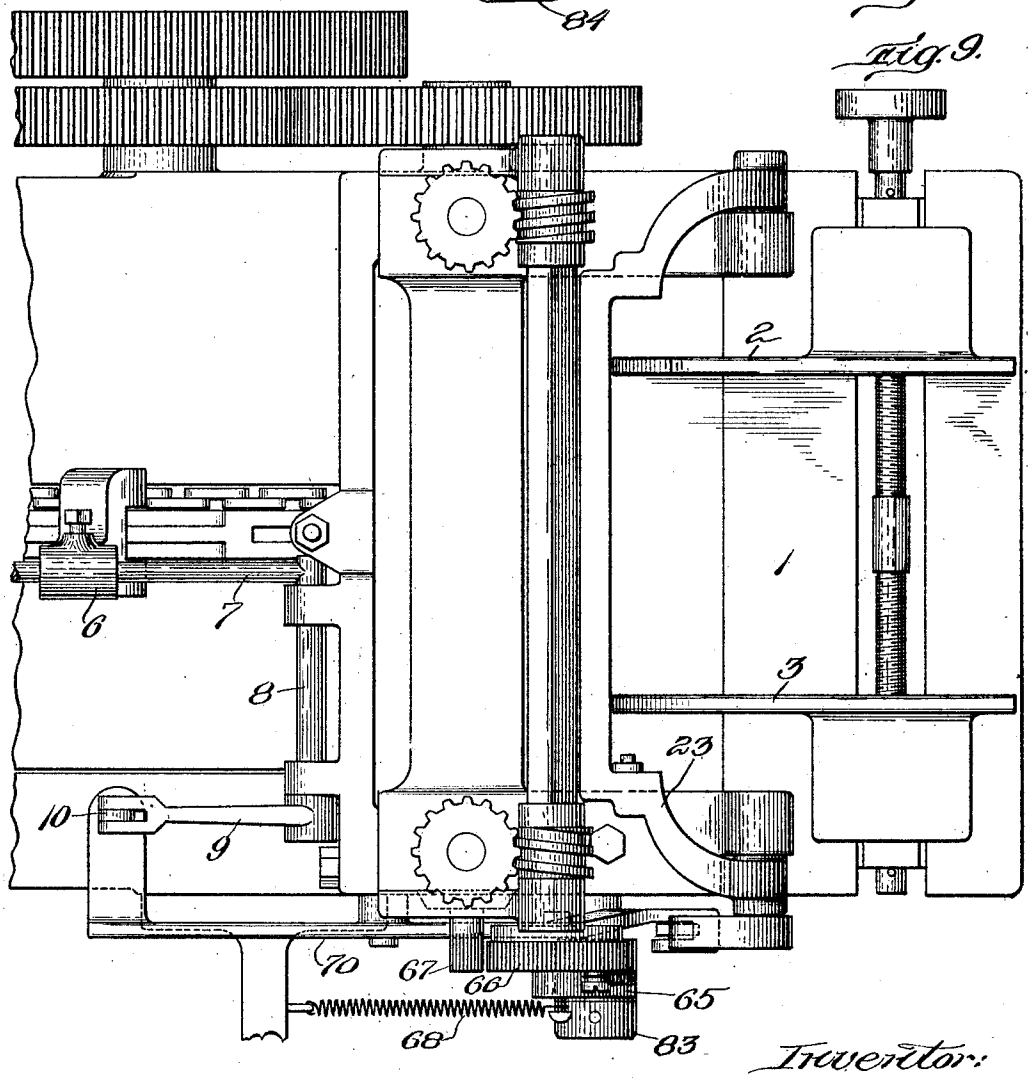


Fig. 8.

Fig. 9.



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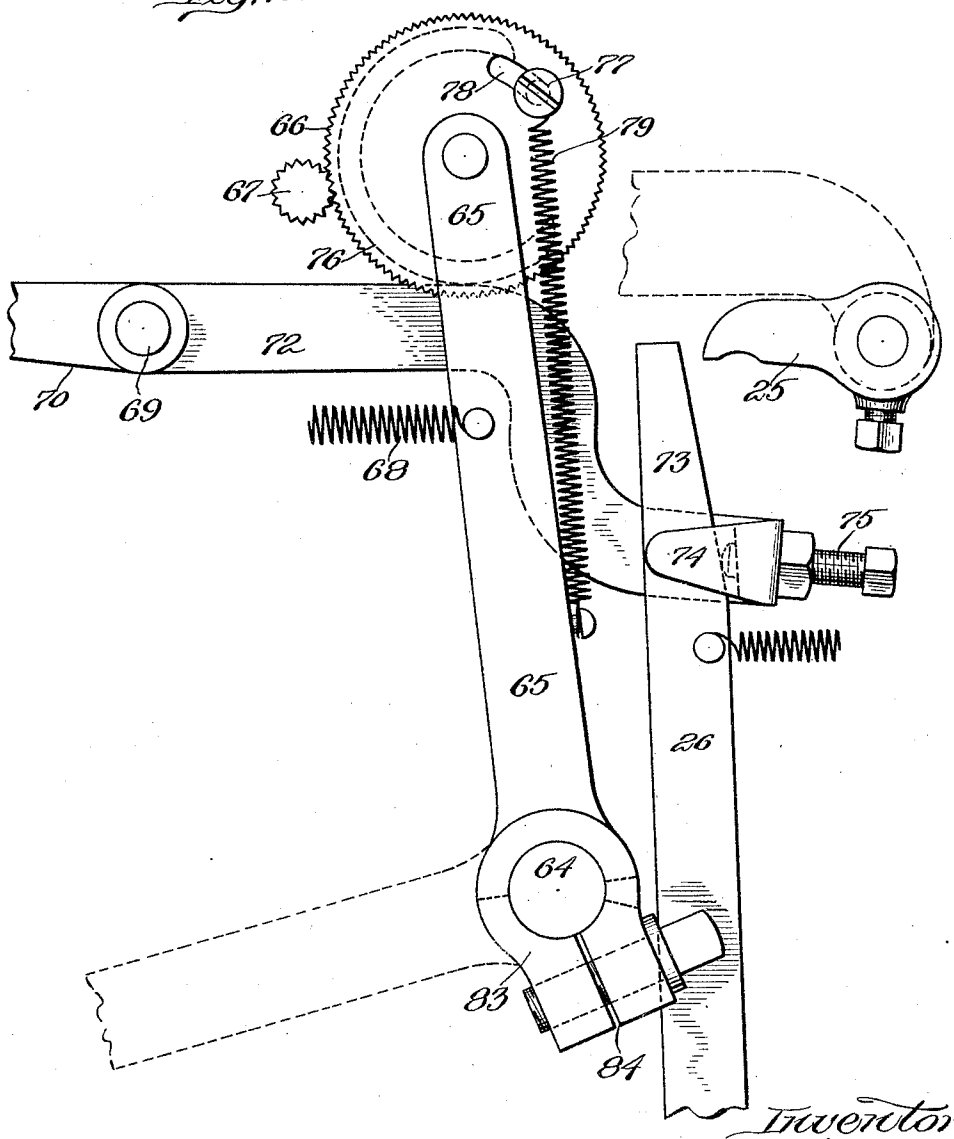
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FLESHING AND GRADING MACHINE

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Fig. 10.



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Attys.

Patented Feb. 5, 1929. 1,700,978

UNITED STATES PATENT OFFICE.

LEANDER A. COGSWELL, OF MANCHESTER, NEW HAMPSHIRE, ASSIGNOR TO LACENE MANUFACTURING COMPANY, OF MANCHESTER, NEW HAMPSHIRE, A CORPORATION OF MAINE.

FLESHING AND GRADING MACHINE.

Application filed July 26, 1922. Serial No. 577,700.

My invention is a machine for ascertaining the grade of a piece of dried-out stock or leather with reference to its thinnest portion after the manner of the well-known Nichols evening and grading machines, and then grading and fleshing said stock. Although my machine is adapted to handle any kind of cut leather, it is especially intended for such pieces as usually require to be fleshed such as welt innersoles and turn outersoles. One reason that it is customary to flesh such innersoles and outersoles is that the channels must, of course, be tough in stitching substance and not brittle, and hence it is desirable that the flesh or stringy fibre on the flesh side of the stock should not be cut off down to the meat or brittle part of the stock, but on the other hand, the loose or flabby portion of the flesh should be removed. The more uniform the fleshing is, the better channeling can be done on a given piece. Stock of this nature must be fleshed and also graded, the fleshing being necessary to insure the best channeling, and the grading to enable the shoemaker to use the right grade of stock for any given work. The grading of this kind of stock has heretofore been done by hand and my invention enables both the fleshing and the grading to be accomplished at one and the same time, automatically, in the same machine.

A further feature of my invention consists in actually fleshing and grading the piece of stock from the very beginning of the blank, especially in case of rands and certain soles which require not only fleshing their entire length but grading from the heel. On the other hand, my invention permits fleshing the entire length while grading less than the entire length, as for example from the ball only of a sole, whenever so desired.

As my invention is broadly novel in its many features and combinations, it will be understood that it may be embodied in a wide variety of mechanical constructions and arrangements.

In the preferred embodiment herein shown,

Fig. 1 shows the machine in side elevation, partly broken away, and sectional for clearness of illustration;

Figs. 2 and 3 show in end elevation and horizontal section respectively, views of the yielding journal box of the upper gauge roll;

Fig. 4 is a vertical transverse section of the machine showing said yielding upper roll and lower fleshing roll in rear elevation;

Figs. 5 and 6 are sectional details of the adjusting mechanism for said lower roll, taken respectively at about the points 5 and 6, Fig. 4;

Figs. 7 and 8 are perspective views of details of the sleeves shown in Figs. 1 and 10;

Fig. 9 is a broken detail in top plan of the front end of the machine; and

Fig. 10 is an enlarged fragmentary detail in side elevation of a portion of the front part of the machine, showing details of the mechanism which permits the actual grading to begin at the extreme forward end of the heel of the sole as it enters the detecting or feeler mechanism.

For more conveniently presenting my invention, I have embodied the same in one of the well-known commercial types of the Nichols machine as shown in general construction in Patent 1,130,321, dated March 2, 1915, and, therefore, I refer to said patent for the general construction and operation of many of the parts which I have made use of in carrying out the combinations necessary for the embodiment of my invention. The work proceeds from a table 1 between guides 2, 3 to the feeler rolls 4, 5 which also act as feed rolls, and thence beneath a trip or shoe 6 adjustable on a rod 7 projecting from a rocker shaft 8 on whose outer end is an arm 9 carrying a post 10 in position to engage the rear end 11 of a pawl 12 to release the same from the thinness-measuring teeth 13 of a ratchet wheel 14 fast on a shaft 15. Shaft 15 carries loosely a segmental rack 16 engaged with the correspondingly toothed end 17 of an actuating lever 18 responsive to the movement of the roll 5, all as shown and described in connection with further details in said patent, together with a locking pawl 19 in position to engage the ratchet teeth 20 of the ratchet wheel 14, said locking pawl being actuated by a tail-piece 21 connected by a link 22 to the gate 23 in front of the rolls 4, 5. Said gate is pivoted at 24 adjacent to the bed of the machine at the entrance end, and is actuated by an arm 25 and lifting rod 26, pivoted at 27 to a bar 28 pivotally mounted intermediate its ends at 29 on the frame of the machine and connected by a rod 30 to the shaft or journal 31 of the upper gauge roll 32 (using this term as in the Nichols patents) at the outgoing

end of the machine. Beneath this upper roll is a lower roll 33 which cooperates with a knife 34. The shaft 15 carries a crank or bracket block 35 against which the movable sector 16 strikes when actuated by the sector 17 (said two sectors being held to each other by a spring 36) and thereby actuating the shaft 15 and a segmental rack or gear 37 meshing with a rack 38 which in turn meshes with a pinion 39 at the lower end of a shaft 40 at whose upper end is a pinion 41 to actuate a rack bar 42 connected by a link 43, see Fig. 4, with a grading mechanism which as herein shown is a marker, although any form of grader may be employed. Briefly, the marker consists of a swinging toothed sector 44 engaging a pinion 45 at the lower end of a reciprocating carrying post 46 to set and actuate a marking wheel 47 driven down by a propelling arm 48 and spring 49, all as in the Nichols patent aforesaid.

The lower roll 33 has its journals carried on a yoke 50, best shown in Fig. 4, supported on posts 51, 52 threaded into bosses 53 on yoke 50 at their upper ends and mounted to turn loosely at their lower ends in a cross bar 54 of the frame of the machine. These posts are turned by worm nuts 55, worms 56, 57, shaft 58 and hand-wheel 59, the worm 57 being splined for longitudinal movement when desired. Thus, by turning the hand-wheel 59 one way or the other, the fixed distance between the fleshing roll 33 and the knife 34 is determined, said roll being moved up or down in parallelism to itself when both worms 56 and 57 are in engagement with their nuts 55, but said roll may be adjusted angularly, i. e., one end moved up or down in relation to the other by simply shifting the worm 57 out of engagement with its nut and then turning the hand-wheel 59, such adjustment being desirable to bring the roll 33 into true position for any given knife or for instance, when a knife happens to be set or ground so as to require it. The first adjustment mentioned determines the thickness of the fleshing operation, usually about one-half iron (one ninety-sixth of an inch). The worm 57 may be held fast to the shaft 58 by means of a set screw as indicated in Fig. 4. The upper gauge roll 32 has divided or recessed journal boxes, see Figs. 2, 3 and 4, in which are mounted heavy springs 60 preferably elliptical or in shape like a carriage spring, above which springs are the lower wedge blocks 61 held in place on the springs by screw bolts 62 tapped into the journal box proper. Above these wedge blocks are the upper wedge blocks 63 fast on the rack plate or bar 42, being the same in construction and operation as the corresponding adjusting wedges 27 in the Nichols patent aforesaid. The arrangement is such that either or both of these springs may yield enough to take care of the thickness of the sole in excess of the thin part detected. As the lower roll 33 does not yield and as soles are always more or less uneven, these springs are provided in connection with the gauging roll to accommodate this unevenness and they are of such shape and the recess containing them is milled out to such a depth as to permit yielding movement to the extent which is liable to be required by the thickest or most uneven sole.

To make certain that the blank will be acted upon from the extreme forward end of the blank, or heel of the sole, or front end of a rand, I secure to the projecting end of the rocker shaft 64 of the sector lever 18, a swinging arm 65 which carries at its upper end a finely toothed wheel or gear 66 adapted to mesh with a pinion 67 on the outer projecting end of the axle of the upper roll 4, said swinging arm being under normal impulse by spring 68 to bring the teeth of the gear 66 into engagement with pinion 67. Just below this gear and pinion is an arm or double lever pivoted at 69 to the head or frame of the machine and having a part 70 projecting into lifting engagement beneath a pin 71 on the post 10 and a part 72 projecting in the opposite direction. The end of part 72 is provided with a hook-like member 74, which embraces the upper cam-shaped end 73 of the lever 26. An adjustable bearing stud 75 mounted in the end of lever 72 engages the cam surface of member 73. The wheel 66 has a depressing cam 76 on its inner face in position to engage the lever member 72 to depress the same when said wheel is rotated so as to bring the cam into engagement therewith. A stop 77 adjustable in a slot 78 of said wheel is in position to strike against the arm 65 to control the position of the wheel when not engaged with the pinion 67. A spring 79 normally tends to turn the wheel when the latter is free, so as to bring the said stop into said engagement and thereby always insure that the wheel shall be in proper position when swung into engagement with the pinion 67. When set as shown in Fig. 1, it is obvious that the instant the piece of leather enters between the rolls 4, 5 and the wheel 66 engages the pinion 67, the cam 76 will immediately depress member 72 and raise member 70 of the tripping lever and thereby raise the post 10 and permit the measuring pawl 12 to engage its teeth 13 and therefore start measuring the leather piece from its very extreme forward end. By changing the adjustment of the stop 77 (or depending on the trip 6) the grading may begin back from the front end of the blank as may be desired, but without changing the fleshing for the entire length of the blank; so that, for instance, a sole may be graded from the ball to the rear or toe-end and fleshed its entire length from the heel-end to the toe-end. In view of the fact that the toothed sector arm 18 has a variable extent of swing-

ing movement, I have provided the lower end of the arm 65 with a sleeve 80 loosely mounted on the shaft 64 and having a notched outer end 81 adapted to coperate with the notched end 82 of a holding collar 83 split at 84, to be clamped on the outer end of the shaft 64 in position to hold the arm 65 and yet permit limited swinging movement of said arm.

In operation, the fleshing roll, or splitting roll 33 is first adjusted downwardly from the cutting edge of the knife 34 by turning the handle 59 enough to regulate the amount of flesh to be removed from the flesh side of the sole, (usually one-half iron or a little more). If the knife and roll are not in accurate parallelism the worm 57 is slid along its shaft 58 out of rotating engagement with its worm wheel 55 so as to leave the screw 52 idle and the other screw 51 is operated up or down until the true parallelism is secured, whereupon the worm 57 is brought again into engagement with its wheel 55 so that thereafter the operation of the hand-wheel 59 will move the splitting roll 33 up or down in true parallelism to itself and to the knife. The soles are then fed through the machine in the usual manner, being fed by hand, or otherwise, one by one, between the guides 2, 3 and thence between the rolls 4, 5 to be graded to the lightest or thinnest place and stamped by the marking wheel 47 which is set automatically to the thin place detected, in well-known manner. If the stock requires to be graded from its extreme forward end, the cam wheel 66 is set as shown in the drawings and the moment the lever 18 is depressed by the lowering of the feeler roll 5 the shaft 64 thereby instantly permits the arm 65 to swing so as to couple together the wheel 66 and pinion 67 with the result that the cam 76 of said wheel depresses the right-hand end 72 of the lifting lever, thereby raising the end 70 and through the post 71 and tail-end 11 engages the measuring pawl 12 with its ratchet 13 so that the measuring begins to take place at once from the extreme forward end of the stock. This same movement of the member 72 operates through the parts 73, 74, 75 to disengage the lifting rod 26 from its holding engagement with the arm 25 and thereby leaves the gate 23 in position to fall when the stock passes forward from beneath its free end. As it falls it locks the measuring wheel 14 by the engagement therewith of the pawl 19. Meanwhile the movement of this wheel 14 has operated through the toothed sectors 16 and 17 and through parts 37, 38, 39, 40, 42, etc. to set the marker, and as the stock is fed along it is marked thereby in due order, the same as in the patent aforesaid as it enters and raises the gauge roll 32. Although the lifting of the gauge roll by the stock causes the wedge cams 61 to engage the opposite stepped wedges 63 in the position to which the latter have been adjusted by the feeler mechanism, the stock is simply maintained in accurate fleshing engagement with the knife 34 and is fleshed according to the adjustment of the roll 33, because the springs 60 in the journal boxes of the upper roll 32 are compelled to yield to any extra thickness of the piece of stock and yet are sufficiently strong to hold the stock unyieldingly in fleshing position. Because of this construction the stock is simply fleshed to the desired extent, and yet, although said stock is of uneven thickness, the yielding roll 32 maintains substantially uniform pressure on the stock. Having been set by the automatic detecting and setting mechanism, the roll 32 is adjusted with reference to the thinnest point, and, therefore, can never be at a further distance from the roll 33 than it should be for proper work, and hence the pressure on the stock will always be present and imperfect fleshing cannot take place, the springs 60 taking up all the extra thickness of the stock which exists between the said thinnest measurement and the fleshing thickness to which the roll 33 has been set and which is being removed from the flesh side of the stock.

It will be understood that my invention may be embodied in various mechanical combinations, the one herein shown and described being best adapted to purposes of explanation and illustration. Also it will be understood that various sub-combinations, as hereinafter claimed, are useful in other relations and that various other arrangements and combinations of parts, all within the scope of the claims hereinafter contained, are within the purview of my invention.

My invention is further defined in connection with my claims as follows:

1. In a machine of the kind described, in combination, means for measuring a blank, splitting mechanism adapted to remove from one surface of the blank a thin sheet of uniform thickness irrespective of variations in thickness of the blank as a whole, leaving the relatively thick body of the blank containing its original variations in thickness, and mechanism responsive to said measuring means for grading the blank as measured.

2. In a machine of the kind described, means for detecting the grade of a blank, and fleshing mechanism for removing a predetermined thickness from the flesh side of the blank, combined with a stock engaging member responsive to said detecting means for maintaining pressure on the grain side of the blank in opposition to said fleshing mechanism.

3. In a machine of the kind described, means for detecting the grade of a blank, fleshing mechanism for removing a predetermined thickness from the flesh side of the blank, combined with a yielding stock engaging member responsive to said detecting

means for maintaining yielding pressure on the grain side of the blank in opposition to said fleshing mechanism.

4. In a machine of the kind described, means for detecting the grade of a blank, fleshing mechanism for removing a predetermined thickness from the flesh side of the blank, combined with a stock engaging member responsive to said detecting means for maintaining substantially uniform pressure on the grain side of the blank in opposition to said fleshing mechanism.

5. A machine of the kind described comprising means for detecting the grade of a blank of stock according to thickness, fleshing mechanism for removing a predetermined thickness from the flesh side of the blank, an adjustable and yielding stock engaging member for maintaining pressure on the stock in opposition to the fleshing mechanism, and means responsive to the detecting means to control the adjustment of said stock engaging member in accordance with the thinnest spot of the blank as determined by the detecting means.

6. A machine of the kind described comprising grading mechanism, fleshing mechanism having an adjustable pressure member, and means common to the grading mechanism and the fleshing mechanism for coordinating the same comprising grade detecting means to which both the grading mechanism and the pressure member of the fleshing mechanism are responsive, said fleshing mechanism being adapted to remove from the flesh side of the blank a layer of uniform thickness irrespective of variations in thickness of the blank as a whole.

7. In a machine of the kind described, means for detecting the grade of a blank, means for usefully perpetuating said detection, and fleshing mechanism for removing a predetermined thickness from the flesh side of the blank, combined with a pressure device for maintaining pressure in accordance with the grade of the blank on the grain side of the blank in opposition to said fleshing mechanism.

8. In a machine of the kind described, feeler mechanism for detecting the grade of a blank for a desired extent of the length of the blank, grading mechanism responsive to said feeler mechanism for classifying the blank according to said detection, and fleshing mechanism, the aforesaid mechanisms including a splitting knife, an unyielding fleshing roll having fixed adjustment with relation to the knife for determining the thickness to be split from said blank, an opposite yielding pressure roll for maintaining substantially uniform pressure on said blank while being fleshed, and setting connections for controlling said pressure roll according to the grade of said blank.

9. A machine of the kind described, having, in combination, mechanism for detecting the grade of a blank, and fleshing mechanism for removing a predetermined thickness from the flesh side of the blank, said two mechanisms being constructed and arranged to be capable of fleshing a blank for its entire length and detecting said blank for less than its entire length.

10. A machine of the kind described, having, in combination, mechanism for detecting the grade of a blank for the whole or part of its length as desired, and fleshing mechanism for removing a substantially uniform thickness from the flesh side the entire length of said blank.

11. In a machine of the kind described, in combination, means for measuring a blank, fleshing mechanism adapted to remove from the flesh side of the blank a layer of uniform thickness irrespective of variations in thickness of the blank as a whole, and mechanism responsive to said measuring means for grading the blank as measured.

12. In a machine of the kind described, means for detecting the grade of a blank and splitting mechanism for removing from one side of the blank a predetermined thin layer of uniform thickness irrespective of variations in thickness of the blank as a whole, leaving a relatively thick layer containing its original variations in thickness, combined with a blank engaging member responsive to said detecting mechanism for maintaining pressure on the other side of the blank in opposition to said splitting mechanism.

13. In a machine of the kind described, means for detecting the grade of a blank and splitting mechanism for removing from one side of the blank a predetermined thin layer of uniform thickness irrespective of variations in thickness of the blank as a whole, leaving a relatively thick layer containing its original variations in thickness, combined with a yielding blank engaging member responsive to said detecting mechanism for maintaining pressure on the other side of the blank in opposition to said splitting mechanism.

14. A machine of the kind described, having, in combination, means for detecting the thinnest measurement of a blank, grading mechanism responsive to said detecting means, and setting mechanism for setting the grading mechanism with reference to the detecting means, including means for rendering said setting mechanism responsive from the extreme forward end of the blank, and fleshing mechanism for fleshing the blank being graded, adapted to remove from the flesh side of the blank a layer of uniform thickness irrespective of variations in thickness of the blank as a whole.

15. A machine of the kind described, having, in combination, detecting means for detecting the thinnest measurement of a blank,

and mechanism for fleshing and grading the blank in response to the detecting means, said mechanism being constructed and operating to remove from the entire flesh side of the blank the same thickness and to grade the blank with reference to the thinnest spot as determined by said detecting means.

16. A machine of the kind described, comprising a splitting knife, a fleshing roll for determining the thickness of the stock to be split by said knife from a blank, an opposite cooperating pressure roll, and mechanism for automatically regulating said pressure roll according to the grade of the given blank being split.

17. A machine of the kind described, comprising a splitting knife, a fleshing roll for determining the thickness of the stock to be split by said knife from a blank, means for adjusting said fleshing roll toward and from said knife, an opposite cooperating pressure roll, and mechanism for automatically regulating said pressure roll according to the grade of the given blank being split.

18. A machine of the kind described, comprising a splitting knife, a fleshing roll for determining the thickness of the stock to be split by said knife from a blank, an opposite yielding cooperating pressure roll, and mechanism for automatically regulating said pressure roll according to the grade of the given blank being split.

19. A machine of the kind described, comprising means for measuring a blank, a splitting knife, a splitting roll for determining the thickness of the stock to be split by said knife from the blank, an opposite adjustable pressure roll for maintaining pressure on the blank in opposition to said splitting knife and splitting roll, and means responsive to said measuring means for governing the adjustment of said pressure roll according to the measurement of the blank being split.

20. A machine of the kind described, comprising means for measuring a blank, a splitting knife, an unyielding splitting roll for determining the thickness of the stock to be split by said knife from the blank, an opposite adjustable pressure roll for maintaining pressure on the blank in opposition to said splitting knife and splitting roll, springs adapted to exert independent yielding pressure at each end of the pressure roll, and means responsive to said measuring means for governing the adjustment of said pressure roll according to the measurement of the blank being split.

21. A machine of the kind described, comprising feeler mechanism for determining the thinnest place in a blank, a pressure device, and setting mechanism for setting said pressure device in accordance with said feeler determinations, combined with fleshing mechanism adapted to remove from one surface of the blank a thin sheet of uniform thickness irrespective of variations in thickness of the blank as a whole, while the blank is held pressed against the fleshing mechanism by said pressure device.

22. A machine of the kind described, comprising fleshing mechanism, a yielding pressure device cooperating therewith, and mechanism responsive to a characteristic of the blank to be fleshed for automatically setting said pressure device in accordance with said characteristic.

23. In a machine of the kind described, feeler mechanism for receiving a blank and detecting a characteristic thereof, mechanism controlled by said feeler mechanism including a ratchet and a normally disconnected measuring pawl, and mechanism responsive to the entrance of the extreme forward end of the blank to said feeler mechanism for engaging said measuring pawl with said ratchet, thereby rendering said controlled mechanism operatively responsive to said feeler mechanism.

24. In a machine of the kind described, feeler mechanism for receiving a blank and detecting a characteristic thereof, mechanism controlled by said feeler mechanism, and mechanism responsive to the entrance of the blank to said feeler mechanism for operatively connecting said feeler mechanism with said controlled mechanism, said connecting mechanism including a swinging gear on one part and a cooperating gear on the other, said swinging gear being caused to swing by the presence of the blank.

25. In a machine of the kind described, feeler mechanism for receiving a blank and detecting a characteristic thereof, mechanism controlled by said feeler mechanism, and mechanism responsive to the entrance of the blank to said feeler mechanism for operatively connecting said feeler mechanism with said controlled mechanism, said connecting mechanism including a swinging gear on one part and a cooperating gear on the other, said swinging gear being caused to swing by the presence of the blank, and a cam actuated by one of said gears to effect the coupling together of said connection of said mechanisms.

26. In a machine of the kind described, feeler mechanism for receiving a blank and detecting the thinnest measurement thereof, mechanism controlled by said feeler mechanism including a ratchet and a normally disconnected thinness measuring pawl, and mechanism responsive to the entrance of the extreme forward end of the blank to said feeler mechanism for engaging said thinness measuring pawl with said ratchet, thereby rendering said controlled mechanism operatively responsive to the measurement of the thinnest part of the whole blank as determined by the feeler mechanism.

27. A machine of the kind described com-

prising means for detecting the grade of a blank, combined with splitting mechanism including a splitting knife and two opposed blank engaging members, one of which is movable toward and from the other, an adjustable abutment block responsive to said detecting means and a coacting abutment on said movable blank engaging member, and means to exert yielding pressure on the latter blank engaging member when said abutments are in engagement to maintain pressure on the blank in opposition to the knife and the other blank engaging member.

In testimony whereof, I have signed my name to this specification.

LEANDER A. COGSWELL.