J. H. POPE.

SKIVING MACHINE.

APPLICATION FILED FEB. 2, 1906.

1,001,073.

Patented Aug. 22, 1911.

3 SHEETS—SHEET 1.

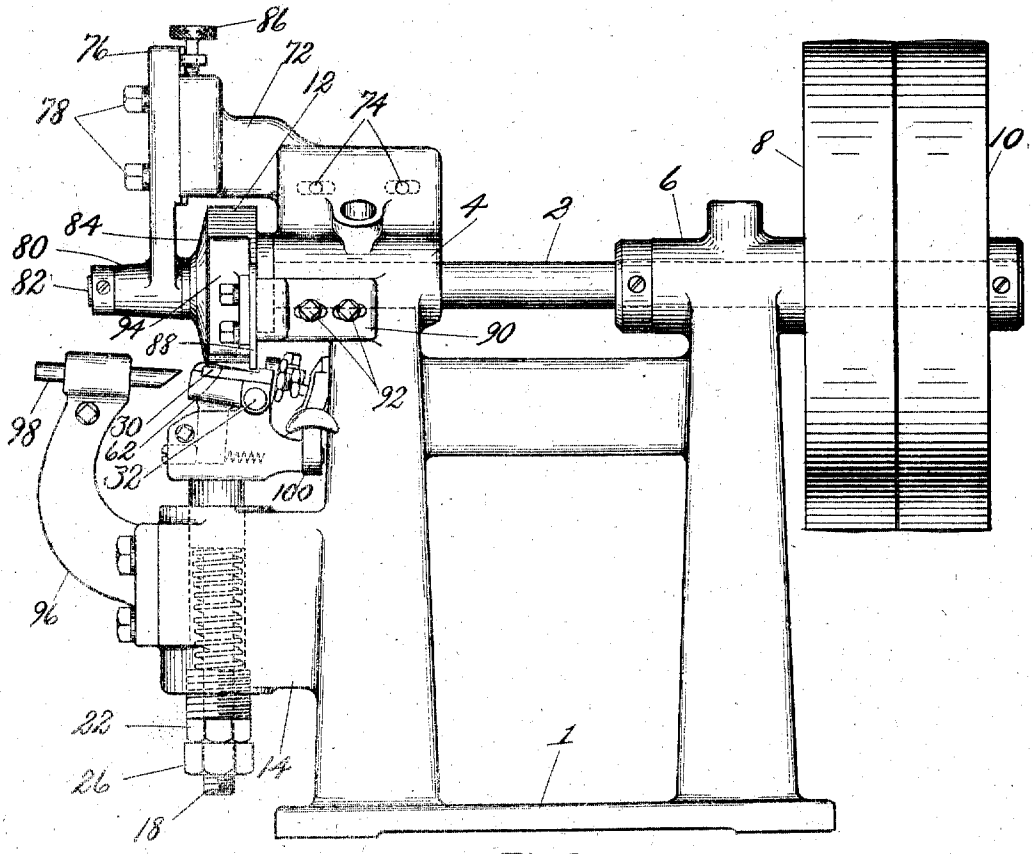

Fig. 1

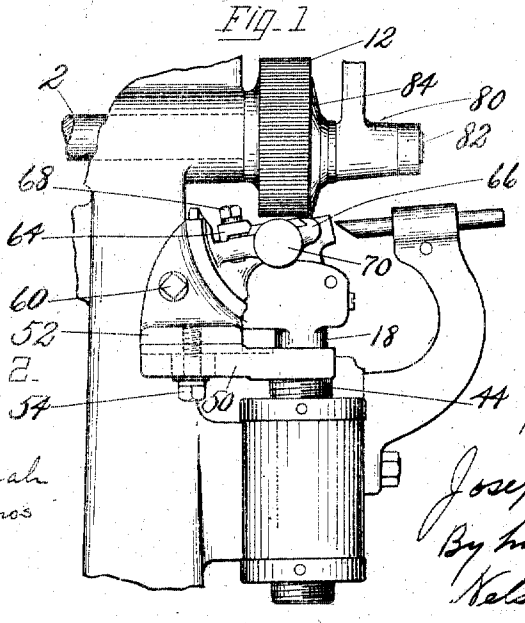

Fig. 2.

WITNESSES.

Bertha L. Hannah

Bernard Barrows

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Joseph H. Pope

By his Attorney,

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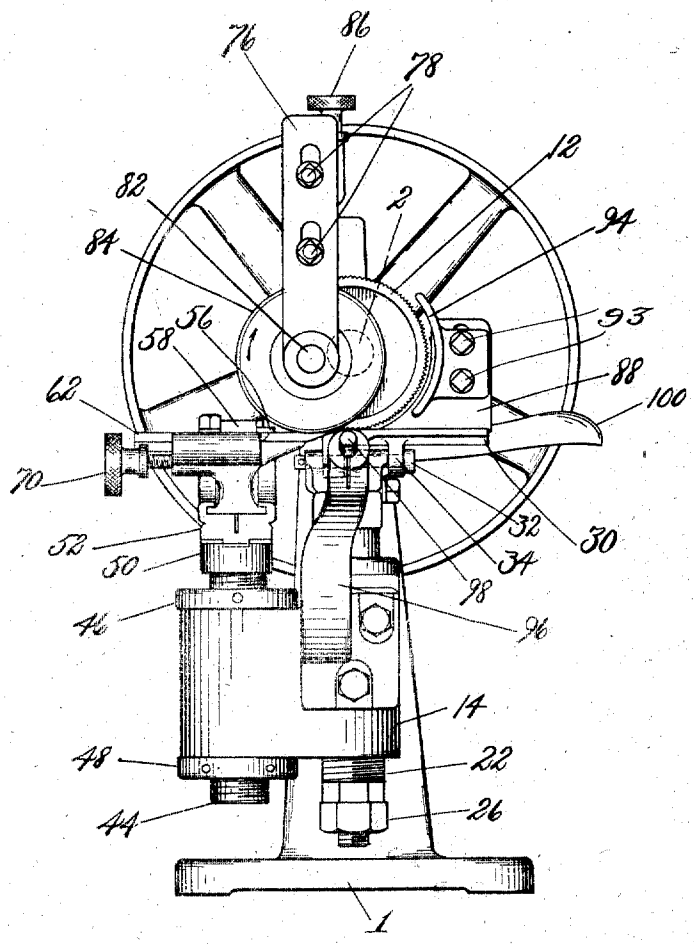

Fig. 3.

WITNESSES.
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3 SHEETS—SHEET 3.

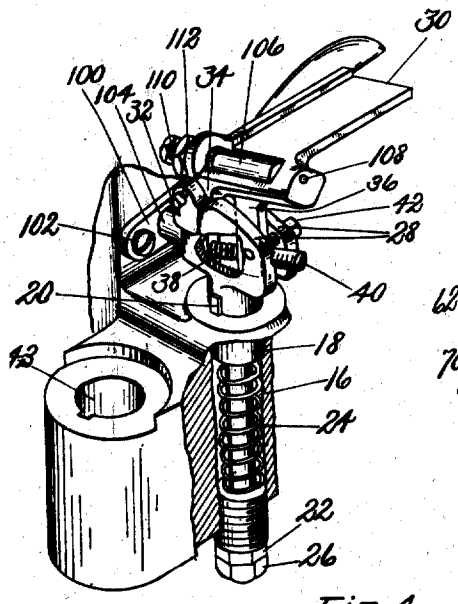

Fig. 4.

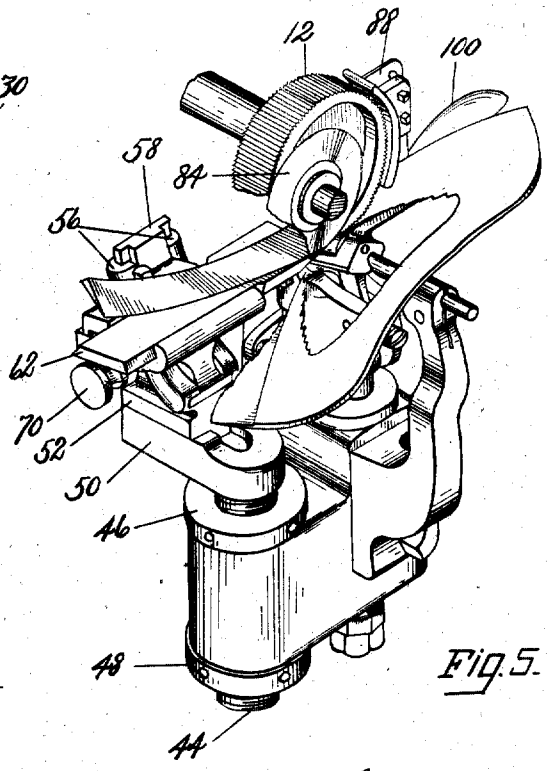

Fig. 5.

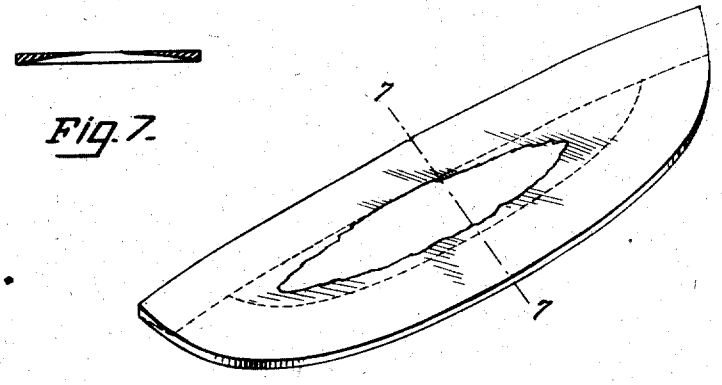

Fig. 6.

Fig. 7.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOSEPH H. POPE, OF BROCKTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SKIVING-MACHINE.

1,001,073. Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed February 2, 1906. Serial No. 299,169.

To all whom it may concern:

Be it known that I, JOSEPH H. POPE, a citizen of the United States, residing at Brockton, in the county of Plymouth and Commonwealth of Massachusetts, have invented certain Improvements in Skiving-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for skiving leather.

In the production of counters for use in the manufacture of boots or shoes, counter skiving machines are in use which comprise a die roller having a die corresponding in shape to the counter to be produced, a pressure device for forcing the counter blank into the die, and a skiving knife for skiving the blank while in the die. The waste stock or offal removed from counter blanks by machines of this type consists of pieces having the same length and width as the counter blanks, being thickest, however, at their sides and ends, diminishing gradually in thickness from the side and end edges toward the central part of the piece. In operating these machines little or no material is removed from the central part of the counter blank so that the corresponding portion of the waste piece is either extremely thin or is perforated by an opening extending longitudinally of the piece. In practice, this opening is generally present and the inner edges formed by said opening are thin and ragged. Heretofore, so far as I am aware, waste stock of this nature has been regarded as of no particular utility and has been generally treated as refuse leather. It is impracticable to trim the stock into a useful shape by hand on account of the expense involved, and no machine has ever been devised to my knowledge capable of performing such an operation mechanically. The outer edge portions of the stock are of considerable thickness, however, so that it is desirable for reasons of economy to utilize the stock as advantageously as possible.

The primary object of my invention is the production of a machine capable of operating upon stock of this nature to produce articles of a form useful in the art.

To this end I have provided a machine for producing from such stock rands or similar articles. This machine is constructed to permit two rands to be cut longitudinally from opposite sides of a piece of stock such as that referred to.

In carrying out my invention I emplcy mechanism for advancing the waste blank or stock against a suitable knife or knives arranged to sever from the stock a longitudinal strip having the form desired. A rand is cut from one side of the blank at a time, the arrangement herein described being such that to act upon both sides the blank is fed twice through the machine.

It will be understood that the waste blank referred to varies considerably in transverse section from point to point in its length. For example, at its extreme ends a blank is of the same thickness from one side to the other, whereas at points intermediate the ends it is thickest at its side edges, and gradually decreases in thickness toward the longitudinal center line of the blank. The edges formed by the irregular shaped perforation in the blank are very thin and are composed of stock from the flesh side of the original counter blank and on this account and because of their extreme thinness they are easily torn.

The mechanism herein shown for feeding the stock is designed to feed evenly and accurately stock having characteristics such as those above mentioned, and to advance it against the knife or knives without mutilating the portion which is to form a rand. The stock is guided in its passage through the machine by an edge gage which the thick side edge of the blank engages and the feeding mechanism is so constructed as to tend automatically to keep the stock in engagement with the edge gage. It is desirable that the feeding mechanism shall not grip forcibly the thin part of the stock lying intermediate the ends of the blank in order to prevent tearing said thin part and the construction is accordingly such that said mechanism grips the thicker portions of the stock with sufficient force to advance the stock against the knife and acts upon said thin part merely to maintain it in proper relation to the cutting knife or knives in the forward movement of the stock.

A knife for removing surplus stock or skiving the margin of the blank is mounted

in stationary position in the path of the blank with its cutting edge arranged transversely to the line of feed. Little or no material requires to be removed by this knife from the central portion of the blank, which as above described, decreases in thickness from the side edges toward the central longitudinal line of the blank. The extreme ends require to be split by this knife by a cut extending obliquely from one face of the blank to the other. At a point intermediate an extreme end and the center the amount of stock to be removed varies with the transverse section of the blank at that particular point. To insure that the marginal part of the blank will be reduced to a substantially uniform section at all points in its length I provide a gage, herein shown as a continuously rotated feed roll having a fixed relation to the cutting edge of the knife and arranged to be engaged by the face of the marginal part of the blank. One face of the blank is maintained in contact with the face of the feed roll and the knife is arranged in an inclined relation to the face of the feed roll in position to remove surplus stock from the opposite face of the blank and to give said marginal part of the blank a substantially triangular or tapered section at all points in its length The stock is held yieldingly against said feed roll by a presser, herein shown as a support for the stock. It is important that during the entire course of the passage of the blank through the machine the part being acted upon by the knife be maintained in correct position with relation to the edge of the knife, for otherwise the stock will be inaccurately skived or mutilated by the knife. In the machine herein shown the presser is arranged and constructed to hold the stock evenly and firmly in contact with the gage or feed roll at all points in the path of the stock, said presser automatically conforming to and accommodating the variable transverse contour of the blank above mentioned. A convenient construction comprises a presser support which is yieldingly held toward the feed roll and upon which is pivotally mounted the presser, said presser being movable in the passage of the work over it about an axis parallel to the line of feed of the work, the point of pivotal support of the presser being so chosen and the arrangement being such that the face of the presser may automatically assume a position parallel to the face of the feed roll or inclined with relation thereto. The point of pivotal support and the arrangement of the presser are also such that pressure is applied by the presser support to the stock through the presser more particularly upon the part of the stock closely adjacent to the side edge of the blank. The part of the presser which the thinner portion of the blank engages is held in close relation to the feed roll in order to hold said thinner portion in contact with the roll, but the arrangement is such that the pressure imparted to this portion of the blank may be slight.

While the arrangement may be such that a single knife completely severs the rand from the stock, I prefer to employ a knife additional to the skiving knife above mentioned for trimming the thin edge of the rand so that said edge will be straight and free from ragged parts. The trimming knife is arranged with its acting edge closely adjacent to the edge of the skiving knife, so that said knives act upon approximately the same part of the stock. On account of the thinness of parts of the stock acted upon a rotary trimming knife is employed, such as a rotary disk knife having a peripheral cutting edge. This rotary knife is arranged with its cutting edge in contact with or in close proximity to the side of the skiving knife at its cutting edge, so that said rotary knife may coöperate with the side of said skiving knife to shear the stock. The trimming knife may be postively rotated if desired. I have found, however, that said knife may be rotated by the stock fed against it and therefore prefer to mount it to freely rotate.

Other features of the invention will be hereinafter described and defined in the claims.

In the drawings which illustrate a machine constituting the preferred embodiment of the invention,—Figure 1 is a view in front elevation of said machine; Fig. 2 is a view in rear elevation of a portion of the machine; Fig. 3 is a view in side elevation of the machine; Fig. 4 is a view in perspective of the presser and its supporting parts; Fig. 5 is a view similar to Fig. 4, showing additional parts and illustrating the operation of the machine; Fig. 6 is a view in perspective of a waste blank from a counter skiving machine; Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 6.

In the machine shown on the drawings, 1 represents a frame upon which is rotatably supported a driving shaft 2 journaled in bearings 4 and 6 upon said frame. Said shaft is provided at its rear end with tight and loose pulleys 8 and 10, respectively, and to its forward end is secured a feed roll 12 having a corrugated or toothed peripheral face for engagement with the work.

A bracket 14 extends forwardly from the lower part of the frame 1, and in this bracket is provided a vertical bore 16 which is threaded at its lower end. In the bore 16 is arranged a stem 18 constituting a support for the presser hereinafter described. The upper part of the stem 18 fits the bore 16 and is provided with a key 20 entering a slot in the walls of said bore 16 and preventing rotary movement of the stem 18. The lower

part of the stem 18 is reduced in diameter, as shown in Fig. 4, and is arranged within an exteriorly threaded nut 22 which is inserted in the lower threaded part of the bore 16. The stem 18 is movable vertically in said nut 22, and between said nut and the upper enlarged portion of the stem 18 is arranged a spring 24 which sustains said stem 18 yieldingly. A nut 26 is provided upon the lower screw-threaded end of the stem 18 and by engagement with the nut 22 limits upward movement of the stem 18. It will be seen that adjustment of the nuts 22 and 26 permits the tension of the spring 24 to be varied and the vertical position of the stem 18 to be controlled.

Upon the upper end of the stem 18 are formed two ears 28. A presser 30 is pivotally supported upon the ears 28 by a pin 32 passing through lugs 34 upon the bottom of the presser 30 and through the ears 28. The presser 30 is provided with a depending shank 36 arranged between the ears 28. A spring 38 is arranged in the space between the ears 28 for holding said shank toward the left in Fig. 1. An adjustable set screw 40 limits this movement of the shank 36 and a binding screw 42 is shown for pinching together the ears 28 upon the set screw 40 and holding it in fixed position. The shank 36 is free to be moved against the resistance of the spring 38. The bracket 14 is also formed with a vertical bore 43 arranged at the rear of the bore 16. In the bore 43 is arranged a standard 44 for supporting a knife holder held from rotation in said bore 43 as by means of a key. The standard 44 is screw-threaded and nuts 46 and 48, arranged to engage respectively upper and lower faces of the bracket 14 and threaded upon said standard, serve to hold said standard in fixed position, vertical adjustment of the standard in said bore 42 being permitted. The upper end of the standard 44 is provided with an arm 50 formed with a horizontal guideway in its upper face in which is arranged a slide 52. Said slide 52 is adjustably held in place by a set screw 54 passing through a slot in the arm 50 and entering said slide, as shown in Fig. 2. The slide 52 is formed with two upstanding members 56, between which is formed a curved guideway in which is mounted a knife holder 58. A clamping bolt 60 engaging the clamping members 56 is provided to hold said knife holder in fixed position. The knife 62 is adjustably held upon the holder 58 by means of a clamp 64, the knife being held between said clamp 64 and a flange 66 upon the holder, a set screw 68 being provided to force the clamp 64 against the edge of the knife. To facilitate accurate adjustment of the knife a thumb screw 70 may be mounted upon the holder 58 in position to engage said knife.

A bracket 72 is adjustably secured to the upper part of the frame 1, as by means of bolts 74 passing through slots in the bracket and entering said frame, as shown in Fig. 1. A bar 76 is adjustably secured to said bracket 72, as by means of bolts 78 passing through slots in said bar and entering said bracket. The bar 76 is formed with a hub 80 at its lower extremity, said hub being bored to constitute a bearing for the stem 82 of a rotary disk cutter 84. Said cutter is freely rotatable upon said hub. The axis of the cutter 84 is located to the rear of the axis of the feed roll 12, as shown in Fig. 3, and the peripheral cutting edge of the cutter is arranged in close proximity to or in contact with the side of the skiving knife 62, and acts upon the stock at approximately the same point as the cutting edge of the knife 62. A thumb screw 86 may be provided if desired to facilitate vertical adjustment of the cutter 84, said thumb screw being arranged in engagement with the bar 76. An edge gage 88 is arranged at the side of the feed roll with its work engaging face approximately in line with the inner corner of the knife 62. Said edge gage is supported by a bracket 90 having slots in which bolts 92 are arranged, said bolts entering the frame 1. The slots in said plate 90 permit adjustment of the edge gage 88 transversely to the line of feed of the work. The edge gage is secured to said bracket by bolts 93 passing through vertically arranged slots in said gage into said bracket, the slots permitting vertical adjustment of the edge gage. I have shown a guard 94 also sustained by bolts 93, said guard being constructed to cover the lower exposed part of the feed roll so that liability of injury to the operator through accidental contact with said roll is prevented. The horizontal adjustment of the edge gage permits the width of the rands produced to be varied.

Where the stock operated upon is of the character illustrated in Fig. 6, having an irregular perforation in its central part, there is some liability of the stock catching upon parts of the machine as it is advanced against the knives. To guard against this contingency I have shown an arm 96 arranged to support the parts of the blank not sustained by the presser 30. The arm 96 is secured to the bracket 14 and is provided at its upper end with a finger 98 adjustably clamped in fixed position so that its inner end may be brought as close as desired to the edge of the presser 30.

I have shown a hand lever 100 pivoted at one end upon the frame 1 at 102 and having intermediate its ends a perforation entered by a stud 104 projecting laterally from the upper end of the stem 18. Said hand lever permits the stem 18 to be manually depressed when desired—for example, in

case it is desired to remove a bl ık wedged in the machine.

The presser 30 is preferably provided with a roller at a point beneath the center of the feed roll 12 in order to reduce resistance to movement of the stock over said presser. I have shown a cylindrical roller 106 arranged in a cavity in the rear end of the presser, said roller being freely rotatable in said cavity, it being journaled at one end upon a pin 108, and at the other end upon the end of a threaded pin 110, held in fixed position by a set nut 112. As shown in the drawings, the axis of the roller 106 is substantially in vertical alinement with the axis of the feed roll 12 so that said roller supports the stock at the point where the greatest pressure is applied by the feeding mechanism.

In adjusting the several parts of the machine shown in the drawings the skiving knife is preferably arranged with the outer corner or end of its cutting edge substantially in vertical alinement with the outer edge of the feed roll. The center of curvature of the guideway formed between the clamping members 56 is in line with said outer corner of the cutting edge, so that movement of the holder 58 in said guideway does not change the position of said corner of the knife. It will be seen, therefore, that the angle of inclination of the knife to the face of the feed roll may be changed as desired without necessitating alteration in position of the slide 52 upon the arm 50. It will be understood that it may be desired to change the inclination of the skiving knife according to different circumstances. For example, where the stock is thin the knife may be given less angle of inclination to the face of the feed roll than where the stock is thicker in order that the rands produced may taper from one side of the strip to the other. The knife is adjusted horizontally by the thumb screw 70 to bring its cutting edge as near as practicable to the center of the feed roll, said knife being also adjusted vertically by movement of the standard 44 to bring the outer corner of the cutting edge in substantially horizontal alinement with the lowermost portion of the outer edge of the feed roll. The rotary knife 84 is positioned to rotate freely in close proximity to or in contact with the side of the knife and its cutting edge is arranged approximately at the outer corner of the cutting edge of said knife.

The stem 18 which supports the presser 30 should hold the work against the feed roll with sufficient pressure to insure the feeding of the work against the knives. The nut 26 constitutes a stop to limit upward movement of said stem and the nut 26 and nut 22 constitute means whereby the tension of the spring 24 may be varied. It is desirable to provide a stop to limit upward movement of the presser in order to keep the presser from coming in contact with the rotary feed roll, since contact of these two devices would cause them to injure one another. Moreover, by holding the presser slightly removed from the face of the feed roll introduction of the stock is facilitated. The tension of the spring 24 having been suitably adjusted, the stem 18 may be adjusted vertically to such a position that the feed roll bears upon the work with sufficient pressure to feed it. The stop formed by the set screw 40 should be so adjusted that when the stem 18 is at the limit of its upward movement the outer part of the work supporting face of the presser will lie in close relation to the face of the feed roll, without, however, coming in contact therewith. It will be observed from Fig. 1 that the axis of the presser 30 is substantially in vertical alinement with the acting face of the edge gage. It will be seen, therefore, that the spring 24 exerts a greater pressure upon the strip of stock at the edge next to the edge gage than at points adjacent the rotary knife 84. The pressure applied to the stock at the latter points is controlled independently of the pressure upon the edge portion by means of the stop 40 and spring 38. The spring 38 is preferably considerably weaker than the spring 24—for example, of a tension merely sufficient to hold the outer margin of the stock in contact with the outer part of the feed roll without exerting any considerable pressure upon it. The stop 40 also controls the pressure applied to the outer margin of the stock since it limits movement of the outer part of the presser toward the feed roll.

I have found that the feeding mechanism herein described automatically holds the edge of the stock in contact with the edge gage whether said edge be straight or curved. It will be seen that the feeding mechanism acts more particularly upon the edge portion of the stock, and I have found this feature to be of advantage in tending to swing the stock against the edge gage. Where the edge of the stock is curved—for example, in operating upon the curved side of the blank shown in Fig. 6—this tendency of the feeding mechanism to hold the blank in engagement with the edge gage is particularly useful.

In the operation of the machine shown, the end of a waste blank, such as shown in the drawings, is placed in position to be drawn through the machine by the continuously rotating feed roll, the edge of the blank being in contact with the edge gage. The blank is preferably presented to the machine with its skived side uppermost, as I have found that the feed roll acts more advantageously upon this side of the stock

than upon the flesh side. As the blank is drawn in by the feed roll the outer side of the presser is depressed by the blank so that said presser assumes an approximately horizontal position, and as the blank is advanced the presser conforms to the varying inclination of the lower face of the blank and sustains the stock evenly in contact with the feed roll. The blank is advanced by the feed roll against the edges of the skiving knife and trimming knife, the skiving knife removing surplus stock from the lower face of the marginal part of the blank and the trimming knife trimming the outer edge of the strip acted upon by the skiving knife. As the stock is advanced the trimming knife is rotated by the stock and since the stock acted upon by said trimming knife is supported by the side of the skiving knife, the edge of the stock is evenly sheared off by said rotary knife. When a rand has been cut from one side of the blank the blank may be turned end for end and passed a second time through the machine to sever a rand from the opposite side.

Having described my invention, I claim as new and desire to secure by Letters Patent of the United States:—

1. A leather skiving machine, having in combination, a skiving knife and means for advancing the stock against said knife constructed to grip the stock with a pressure progressively increasing from point to point in the width of said stock, and arranged to maintain a face of the stock at a predetermined inclination to the edge of the skiving knife.

2. A leather skiving machine, having in combination, a skiving knife and means for advancing the stock against said knife comprising a feed roller and a presser having a predetermined acting surface formed to hold the stock in engagement with said roller, and means for yieldingly holding the presser toward said roller constructed to exert a less pressure upon a predetermined portion of the width of said stock than upon other portions.

3. A leather skiving machine, having in combination, a skiving knife, an edge gage for positioning the stock in proper relation to said knife, a trimming knife arranged at a predetermined distance from said edge gage, and means for advancing the stock against said knives constructed to grip the stock and to exert a greater gripping pressure upon portions of the stock adjacent to said edge gage than upon portions adjacent to the trimming knife.

4. A leather skiving machine, having in combination, a skiving knife and means for advancing the stock against said knife comprising a feed roller and a presser having a predetermined transverse acting surface formed to hold the stock in engagement with said roller, means for yieldingly holding the presser toward the feed roller, and means for varying the pressure applied to a margin of the stock without affecting the pressure applied to the opposite margin of said stock.

5. A skiving machine, comprising a feed roll arranged for rotation about a stationary axis, a skiving knife arranged in the path of the stock, and mechanism for holding the stock in engagement with said roll, comprising a presser support, means for yieldingly holding the support toward the feed roll, and a presser pivotally supported upon said support, said presser being movable about an axis approximately parallel to the line of feed of the stock.

6. A skiving machine, comprising a feed roll arranged for rotation about a stationary axis, a knife arranged in the path of the stock, an edge gage for positioning the edge of the stock, a presser for holding the stock in contact with the feed roll, said presser being movable about an axis approximately parallel to the line of feed of the stock and approximately in line with the acting face of the edge gage, and means for holding said presser yieldingly toward the feed roll.

7. A machine of the class described having, in combination with mechanism for feeding and skiving stock, a rotary disk knife for trimming the skived stock, said knife being mounted for movement in the line of feed and arranged to be rotated by the stock as it is fed, and means permitting vertical adjustment of said knife.

8. In a machine of the class described, the combination with mechanism for feeding the stock, of a skiving knife and a rotary trimming knife arranged in the path of the stock, said trimming knife being mounted with its cutting edge adjacent to the side of the skiving knife in position to act upon stock sustained by said skiving knife and to coöperate with the side of the skiving knife to shear the stock.

9. A leather skiving machine comprising a skiving knife, a feed roll arranged for rotary movement about a fixed axis and a presser constructed to hold the stock in engagement with the feed roll throughout substantially the entire width acted upon by the skiving knife arranged to exert different degrees of pressure upon opposite margins of the strip of stock acted upon by the knife.

10. A leather skiving machine, having in combination, a feed roller arranged for rotation about a stationary axis, a skiving knife positioned in the path of the stock and arranged for adjustment about a longitudinal axis in line with a corner of the cutting edge of the knife, a presser arranged to act upon substantially the entire area of that

portion of the stock being skived for holding the stock in contact with the feed roller and means for yieldingly holding said presser toward said roller.

11. A machine of the class described having, in combination, a feed roll, a presser roll, a knife arranged to operate upon stock passed between said rolls, a support for that portion of the stock outside the bite of the rolls and means whereby said support may be adjusted toward and from said knife.

12. A machine of the class described having, in combination, a skiving knife, a feed roll, a presser roll, a carrier to which said presser roll is pivotally connected, resilient means for urging said carrier toward said feed roll and resilient means for turning said presser roll about said pivotal connection.

13. A machine for operating upon stock which is triangular in cross-section comprising a feed roll having a stationary axis, a presser member having a movable axis and resilient means tending to cause angular movement of the axis of said presser member whereby all points in said stock are fed forward at uniform speed.

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

JOSEPH H. POPE.

Witnesses:

BERNARD BARROWS,

ARTHUR L. RUSSELL.