

H. W. WINTER.
LEATHER SKIVING MACHINE.
APPLICATION FILED JUNE 3, 1908.

1,025,556.

Patented May 7, 1912.

2 SHEETS—SHEET 1.

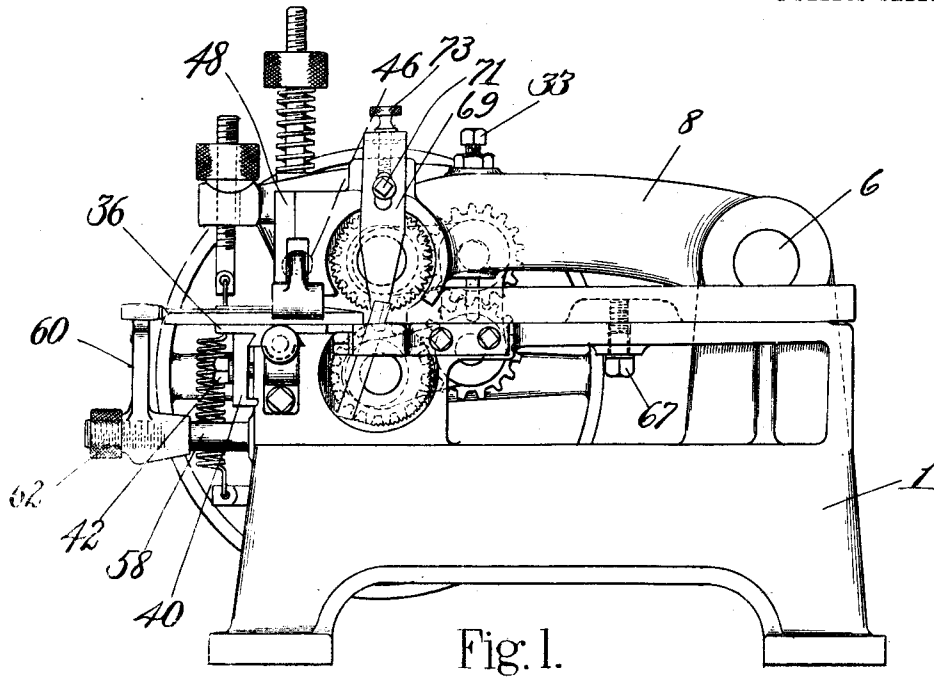


Fig. 1.

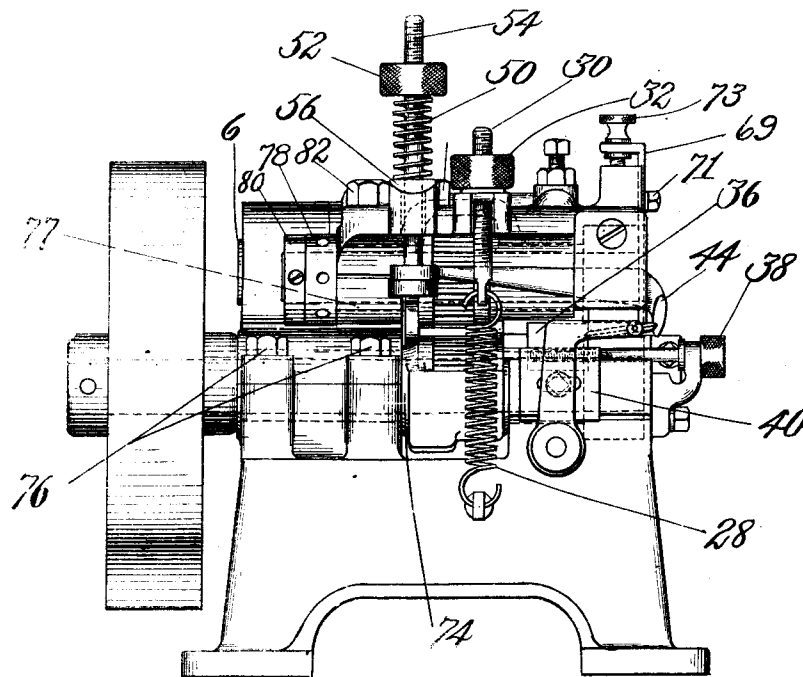


Fig. 2.

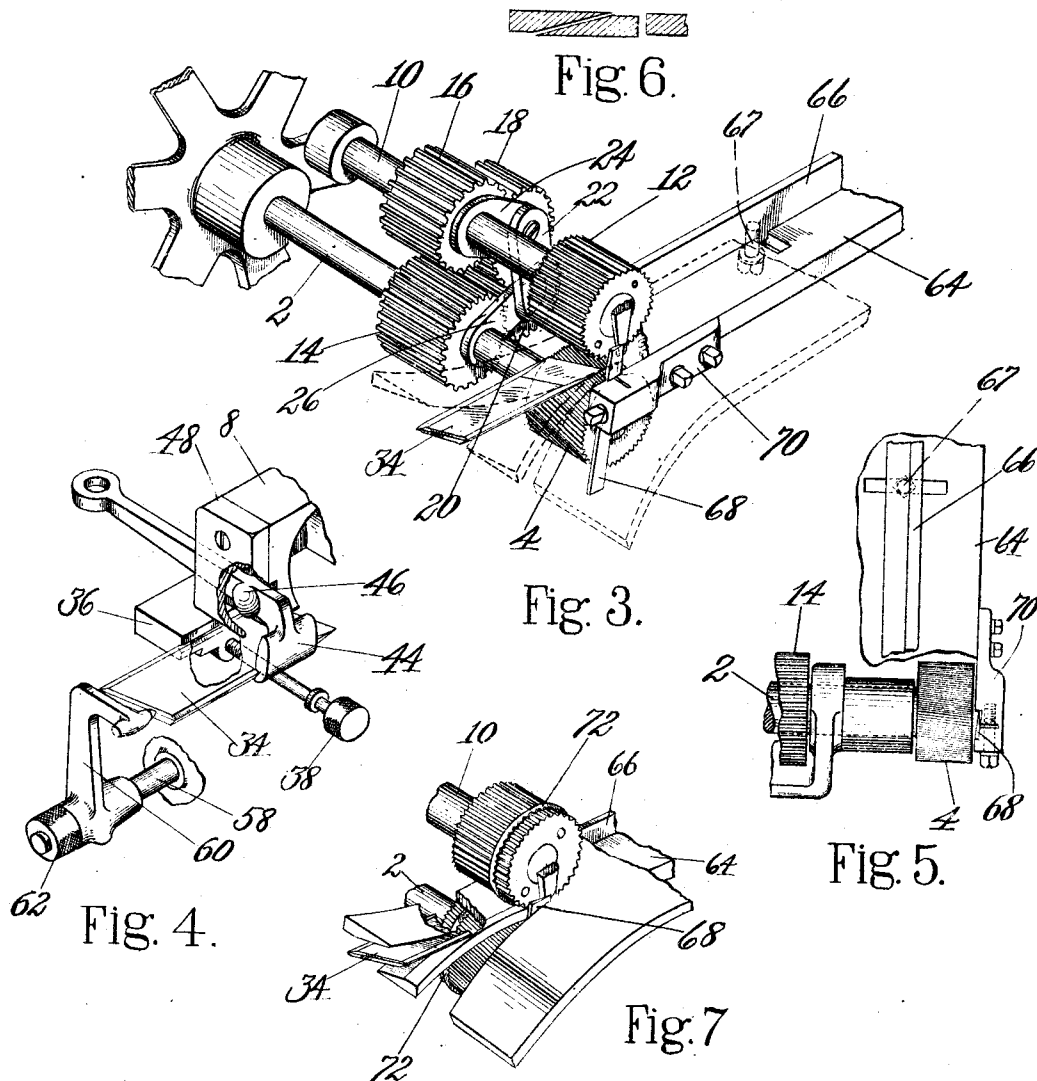
WITNESSES.
Elizabeth C. Coups
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INVENTOR.
Harry W. Winter
By his Attorney,
Nelson & Howard

H. W. WINTER.
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WITNESSES:
Elizabeth C. Coupe
Edith C. Holbrook

Fig. 8.

INVENTOR.
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UNITED STATES PATENT OFFICE.

HENRY W. WINTER, OF METHUEN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LEATHER-SKIVING MACHINE.

1,025,556.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed June 3, 1908. Serial No. 436,464.

To all whom it may concern:

Be it known that I, HENRY W. WINTER, a citizen of the United States, residing at Methuen, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Leather-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 leather skiving machines, and more particularly to machines adapted for use in the preparation of stock for the manufacture of boots and shoes.

The invention is shown herein embodied in a machine which may be used for producing rands, for cutting welts, more particularly McKay welts, or for skiving the ends of taps or for other purposes.

The machine herein shown and described comprises a skiving knife and means for advancing the stock against said knife, the arrangement being such that the strip of stock which advances against the knife is divided longitudinally by a cut extending obliquely from one face to the opposite face of the stock. One corner of the cutting edge of the knife remains stationary in the operation of the machine while the opposite corner is positively moved in accordance with variations in thickness of the stock, so that the cutting edge is automatically maintained in a position adapted to cause the cut produced thereby to have a predetermined relation to the edges of the strip regardless of variations in thickness of the stock.

It is desirable that the thin edges of McKay welts be evenly formed, for if such edges are ragged the subsequent attachment of the welt to shoes by machines commonly employed for this purpose may be interfered with.

One feature of the present invention consists in means for trimming the thin or beveled edges of the two sections into which a strip of stock is divided by the skiving knife. The trimming means is preferably arranged independently of the skiving knife and is, accordingly, so constructed as to form in opposite faces of the stock longitudinal grooves upon lines within and adjacent to the lines of severance thereafter produced by the skiving knife. According to

this arrangement the thin edges of the stock are in effect formed before the stock is divided.

Another feature of the invention consists in the provision of means for automatically splitting a strip of stock into two symmetrical portions irrespective of its thickness and means for varying the shape of the portions produced while maintaining their symmetry.

In the preferred embodiment of the invention, there is provided a plurality of rotatable feed rolls for advancing the stock against the skiving knife. One of the feed rolls, hereinafter termed the gage roll, is arranged for movement about a stationary axis while the other roll, hereinafter referred to as a presser roll, is arranged for vertical yielding movement to accommodate variations in the thickness of the stock. The knife is movably supported and the position of the outer corner of its cutting edge is controlled in accordance with the yielding movement of the presser roll and consequently in accordance with the thickness of the stock, so that while the inner side of the knife remains stationary its outer side is raised and lowered with the presser roll and the obliquity of the cutting edge is thus automatically changed to suit the thickness of the stock operated upon. The arrangement is such that the location of the cut with reference to the edges of the strip may be varied, so that if desired the strip may be severed by a cut located intermediate said edges at a distance therefrom. To this end the construction hereinafter disclosed is adapted to permit the normal obliquity of the knife to be varied and the gage roll is arranged for vertical adjustment, so that the position of the cut in the stock may be raised or lowered.

Another feature of the invention consists in the provision of a presser foot arranged to bear upon the stock at the outer margin thereof and sustained for movement with the presser roll. The presser foot engages the stock at a point nearer the edge of the skiving knife than does the presser roll and is of advantage in maintaining the outer margin of the strip of stock acted upon by the skiving knife in proper relation to said knife.

The form of knife which I prefer to use

consists of a flat, rectangular blade. The holding means for the knife is constructed to grip the knife by engagement with its side edges and the arrangement is such that the knife is held constantly under pressure, so that the position of said knife is accurately controlled at all times during the operation of the machine.

The presser roll in the construction shown is carried upon an arm pivoted upon the frame for vertical movement in a plane parallel with the line of feed of the stock. The inner edge of the knife is arranged in a groove formed in a block mounted upon the frame. The outer edge of the knife is received in a groove formed in a lever pivoted upon the presser roll arm in advance of the presser roll, and a spring is provided to press the lever against the edge of the knife. Since this lever is mounted in advance of the presser roll, the vertical movement of the point of pivotal support of said lever is greater than that of the presser roll, and to cause the vertical movement of the outer edge of the knife to be substantially equal to that of the presser roll the lever which engages said outer edge of the knife is so arranged that this increased movement is compensated for.

In the drawings which illustrate a machine constituting one embodiment of the invention,—Figure 1 is a view in front elevation of the machine; Fig. 2 is a view in side elevation of the machine viewed from the left in Fig. 1; Fig. 3 is a perspective view of parts of the machine illustrating its mode of operation; Fig. 4 is a perspective view of devices for controlling the position of the skiving knife; Fig. 5 is a plan view of parts shown in Fig. 3 illustrating the position of the stripping knife; Fig. 6 is a transverse sectional view of the stock after being operated upon by the mechanism shown in Figs. 1 to 5, inclusive; Fig. 7 is a view illustrating the arrangement of knives for trimming the thin edges of the welts produced by the machine; Fig. 8 is a transverse sectional view of stock operated upon by a machine provided with the trimming knives shown in Fig. 7.

Referring to the drawings, the reference numeral 1 indicates a suitable frame or base for the parts hereinafter described. Upon said frame is mounted a driving shaft 2 provided at one end with a cylindrical feed roll 4. A stud 6 is secured to the frame 1 and upon said stud is pivotally mounted an arm 8 provided at its free end with a horizontal bearing for a shaft 10. The shaft 10 is provided at one end with a feed roll 12 arranged in line with the feed roll 4. Upon the shaft 2 is mounted intermediate its ends a gear 14, and in line with the gear 14 is arranged upon the shaft 10 a gear 16. Motion from the gear 14 to the gear 16 is transmit-

ted by gears 18 and 20, which are in constant engagement with each other and are maintained at a fixed relative distance by links 22 arranged upon opposite sides of said gears and connecting their pivots. The gear 18 is arranged to swing about the gear 16, it being maintained at a constant distance from the axis of the gear 16 by links 24 upon opposite sides of said gears, and the gear 20 is similarly controlled by links 26. It will be seen that by the use of this construction the gears through which motion is transmitted from the shaft 2 to the shaft 10 are constantly in mesh, regardless of the extent to which the shaft 10 and the feed roll 12 carried thereby are moved vertically in the operation of the machine. The free end of the arm 8 is held yieldingly downwardly by a spring 28 secured to the frame 1 and to a screw 30 provided with a thumb nut 32, said thumb nut bearing upon a seat formed upon the free end of the arm 8. To limit downward movement of the arm 8 and prevent the feed rolls 12 and 4 from coming in contact, said arm is provided with a vertically adjustable stop 33, the lower end of which bears upon a part of the frame 1.

In the path of the stock advanced by the feed rolls is a skiving knife 34 formed as a flat blade, the sides of which are beveled, one end having a cutting edge and the opposite end being grooved as shown in Figs. 3 and 4. Said knife is arranged in line with the direction of feed of the stock, and its inner side is received in a shallow horizontal groove formed in the side of a block 36 constituting a rest for this side of the knife. The block 36 is arranged for horizontal adjustment in a direction transverse to the line of feed by means of an adjusting screw 38 and is held in adjusted position by a clamp 40 and screw 42. The opposite side of the knife 34 is received in a groove formed in the face of a lever 44, said lever being pivoted upon the arm 8 at a point in advance of the shaft 10 and is arranged for swinging movement in a plane transverse to the line of feed of the stock. Said lever is provided intermediate its ends with a spherical enlargement 46 which is received in a socket formed partly in the end of the arm 8 and partly in a removable plate 48. It will be seen that with this arrangement the lever 44 is so sustained that it may tilt slightly about a longitudinal axis. The lever 44 is held yieldingly against the knife 34 by a coiled spring 50 which is arranged between a thumb nut 52, mounted upon a rod 54, and a washer 56 seated in a recess in the arm 8. The lower end of the rod 54 bears upon the under side of the end of the lever 44 as will be seen in Fig. 2. The tension of the spring 50 holds the knife 34 securely between the block 36 and the outer end of the lever 44.

A stud 58 extends laterally from the

frame 1 and carries pivotally mounted upon it an arm 60 having at its upper end a projection arranged to bear upon the grooved end of the knife 34, as is clearly shown in Fig. 4. A thumb nut 62 is provided to move the arm inwardly upon the stud 58 and thus advance the cutting edge of the knife toward the axes of the feed roll. By releasing the thumb nut 62, the arm 60 may be swung downwardly out of the way to facilitate removal of the knife 34.

To sustain the stock in its approach to the feed rolls, the frame 1 is formed with a table 64 at the side of the feed rolls. Said table 64 carries an edge gage 66 which is held in fixed position by a bolt 67, and may be adjusted if desired transversely upon the table 64. To sever a strip of stock of predetermined width from the piece being operated upon, there is provided a stripping knife 68 which is held in fixed position by a holder 70, said holder being secured to the table 64. As will appear from Fig. 1, the cutting edge of the stripping knife is approximately in line with the axes of the feed rolls, and is inclined upwardly and to the right in Fig. 1 so that in operation it tends to hold the stock downwardly upon the table 64. To hold the stock automatically against the edge gage 66 in its passage through the machine, the ribs of the lower feed roll 4 are arranged obliquely upon said roll, so that the roll in its rotation presses the stock slightly against the edge gage. If desired, the stripping knife 68 may be arranged, as shown in Fig. 5, with its inner face extending slightly toward the edge gage from its cutting edge in order to provide an additional means for pressing the stock against the edge gage.

A presser foot 69 is supported on the arm 8 upon the outer side of the presser roll 12. The presser foot is secured in vertical position to the arm 8 by a set screw 71 passing through a slot in the presser foot, and a thumb screw 73 is provided to facilitate vertical adjustment of the presser foot. The presser foot is arranged between the stripping knife 68 and the outer side of the presser roll 12 as will appear from Figs. 3 and 7. The outer side of the presser foot is in substantial alinement with the outer side of the gage roll. The presser foot is primarily intended to cooperate with the skiving knife 34 in producing an even line of cut of said skiving knife. It is useful more particularly where the line of cut of the skiving knife terminates short of the edges of the strip of stock split by said knife, as for example, in producing rands or the like of the form shown in Fig. 6. The presser foot bears upon the narrow horizontal marginal portion and the inner side of the presser foot is in substantial alinement with the line in which the edge of the

skiving knife intersects the upper surface of the stock.

In the operation of the machine the presser foot rides over the stock along the line of cut thereafter produced by the skiving knife, and inasmuch as it is pressed against the stock with the presser roll the presser foot compresses slightly the portion of the stock upon which it bears, thus producing a slight groove in the stock. By adjusting the presser foot vertically upon the arm 8 the pressure with which it bears upon the stock may be varied within certain limits to accommodate different kinds of stock. The action of the presser foot upon the stock in advance of the skiving knife causes the thin edge of the upper beveled section produced by the skiving knife to be straight and obviates liability of the skiving knife producing a wavy line of cut at this point.

Where the present machine is used for splitting welts, it may be desirable to employ the arrangement shown in Fig. 7, in which each feed roll is made in two sections, and between the sections is clamped a disk knife 72 projecting slightly from the face of the roll, for example $1/32$ of an inch from said face. The lower feed roll 4 is arranged for vertical adjustment, the shaft 2 being mounted in an eccentric bushing 74 which is held clamped in adjusted position by bolts 76. The upper feed roll 12 is also arranged for vertical adjustment upon the supporting arm 8. To this end the shaft 10 is received within an eccentric bushing 77, said bushing being provided with a flange 78 which is formed to receive the application of a suitable tool to facilitate adjustment of the bushing. A collar 80 secured upon the inner end of the shaft 10 restrains said shaft from longitudinal outward movement, inward movement being prevented by contact of the gear 16 with the bushing 77. The bushing 77 is clamped in adjusted position by bolts 82.

The machine herein shown and described is adapted to sever from a piece of leather a strip of a predetermined width, and to split said strip longitudinally by a cut extending obliquely from one face of the stock to the opposite face. The arrangement may be such that viewing the strip in transverse section the cut extends diagonally from one corner to the corner opposite, independently of variations in thickness of the strip. If desired, the cut may extend from a point in one face at a predetermined distance from one edge to a point on the opposite face at a predetermined distance from the opposite edge of the stock, so that two beveled sections are produced from each strip. Where the machine is used for skiving taps, there is, of course, no occasion for severing from the stock the strip to be operated upon, and when used for this pur-

pose no stripping knife is employed and the machine produces a bevel upon the end of a tap extending from one face to the opposite face of the tap.

5 In the use of the machine shown, when it is desired to produce rands or welts, it will be understood that the edge gage is adjusted relatively to the stripping knife to cause the strip of stock severed by the stripping knife to be of a predetermined width. 10 The obliquity of the skiving knife may be varied by adjustment of the rest 36. Preferably the inner corner of the cutting edge of the skiving knife lies approximately in 15 line with the face of the edge gage. The angular position of the skiving knife may also be varied by vertical adjustment of the presser roll. It will be seen that by raising or lowering the presser roll upon its sup- 20 porting arm the outer side of the knife may be lowered or raised. After the desired obliquity of the skiving knife has been secured, the gage roll may be adjusted to locate the stock at the proper elevation with rela- 25 tion to said knife in order to insure that the cut effected by said knife will be equidistant from the two sides of the strip of stock severed by said knife. It may be found desirable to vary the width of the skiving 30 knife in order to locate the cut produced thereby in precisely the position desired in the stock. It will be observed that knives of different sizes may be held in working position between the rest 36 and the clamp- 35 ing lever 44.

The stock from which the rands or welts are produced commonly consists of a sheet of leather from which successive strips are severed, each of which is divided into 40 two longitudinal sections. In its passage through the machine the stock is held against the edge gage by the obliquely arranged ribs upon the gage roll and also by the inner face of the trimming knife which 45 is arranged at an angle to the line of feed of the stock. The presser roll yields to variations in thickness of the stock and in its movement raises and lowers the pivot 46 of the clamping lever 44. As said pivot is 50 raised it will be seen that the outer end of the lever swings downwardly and the position of said pivot upon the arm 8 and its distance from the groove in which is received the outer edge of the knife are so 55 chosen that the downward swinging movement of the lever in the upward movement of the presser roll compensates for the difference in radius of movement of said presser roll and clamping lever about the 60 stud 6.

With this arrangement the outer corner of the knife remains at all times substantially on the same level as the lowermost 65 portion of the presser roll, so that the strip of stock is split diagonally by a cut extend-

ing from one corner to an opposite corner, regardless of variations in thickness of the stock operated upon. The clamping lever 44 is free to tilt slightly about a longitudinal axis to permit the lever in its vertical movement to accommodate itself to the position 70 of the knife so that the knife remains at all times parallel with the line of feed of the stock. The back stop 60 accommodates such lateral tilting movement of the knife as is 75 produced by the movement of the presser roll. The trimming knife 68 severs a strip of stock of predetermined width from the sheet presented to the machine, said knife acting prior to the skiving knife 34.

When the machine illustrated is employed 80 for producing welts, the presser roll and the gage roll shown in Fig. 7 may be substituted for those shown in Fig. 3. In the passage of the stock through the machine thus ar- 85 ranged, the disk knives 72 groove opposite faces of the strip upon lines within and adjacent to the lines of severance produced in said faces by the skiving means. It will be seen that the knives 72 produce grooves 90 which are uniform in depth regardless of variations in thickness of the stock operated upon. The skiving knife cuts the strip upon the line indicated in Fig. 8 and re- 95 moves the effect of the grooving knives 72. The knives 72 may be used to advantage in work other than making welts and it will be understood that the use herein described is merely illustrative and is not stated by way 100 of limitation.

As above pointed out the presser foot 69 is somewhat similar in point of function to the grooving knife 72 inasmuch as it tends to produce a rand or welt having a straight 105 thin edge.

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

1. A leather skiving machine for producing rands or the like tapering laterally to a 110 thin edge from a point short of the opposite edge comprising means for splitting a strip of stock of predetermined width longitudinally into two beveled sections by a cut ter- 115 minating short of the edges of the strip and means for trimming the beveled edges of the sections.

2. A leather skiving machine, having in combination, a knife arranged to split a strip of stock into two beveled sections, 120 means for advancing the stock against said knife, and means for longitudinally grooving opposite faces of the strip prior to the action of said knife upon lines within and adjacent to the lines of severance thereafter 125 produced in said faces by said knife.

3. A leather skiving machine, having in combination, means for skiving from stock a portion of predetermined width tapering 130 transversely to a thin edge, and means for

grooving the stock prior to the action of said skiving means upon a line within and adjacent to the line of severance produced by said skiving means at said thin edge.

- 5 4. A leather skiving machine, having in combination, means for skiving from stock a portion of predetermined width tapering transversely to a thin edge, and means for grooving the stock prior to the action of said skiving means upon a line within and adjacent to the line of severance of said skiving means at said thin edge, said grooving means being arranged to groove the stock to a uniform depth independent of variations in the thickness of the stock.
- 10 5. A leather skiving machine, having in combination, a skiving knife and means for advancing the stock against the knife, said means including a feed roll having a knife provided with a cutting edge arranged circumferentially about the periphery of the roll in position to groove the stock adjacent to and within the line of severance produced by said skiving knife.
- 15 6. A leather skiving machine, having in combination, a skiving knife and means for advancing the stock against said knife, comprising a gage roll and a presser roll for engagement with opposite faces of the stock, said presser roll being arranged for yielding movement to accommodate variations in the thickness of the stock and a knife for grooving the stock prior to the action of the skiving knife arranged for movement with said presser roll whereby the depth of the groove is rendered independent of variations in thickness of the stock and formed to groove the stock substantially to the plane of the cut thereafter produced by the skiving knife.
- 20 7. A machine of the class described having, in combination, a knife, a plurality of rolls for feeding a strip of stock thereto, connecting means between said knife and one of said rolls whereby the position of said knife is automatically controlled to cause said knife to split a strip of given width diagonally from corner to corner irrespective of its thickness, and means for relatively adjusting the knife and rolls to cause the knife to split the strip by a cut extending from a predetermined distance from one corner to an equal distance from the diagonally opposite corner.
- 25 8. A leather skiving machine, having in combination, a gage roll arranged for movement about a stationary axis, a presser roll above the gage roll arranged for vertical yielding movement, a work support arranged at the entrance to said rolls, a skiving knife mounted upon the side of the rolls opposite to the work support with its cutting edge extending transversely to the line of feed, means for controlling the position of said knife constructed to maintain its inner corner at a constant elevation and to cause its

outer corner to be raised and lowered with the presser roll, and means for raising and lowering the rolls.

9. A leather skiving machine, having in combination, a gage roll arranged for movement about a stationary axis, a presser roll for holding the stock in engagement with the gage roll arranged for vertical yielding movement, a skiving knife arranged in advance of said rolls in the path of the stock, a stationary rest for the inner side of the knife formed to permit swinging movement of the knife about said side as an axis and arranged for adjustment transverse to the line of feed of the stock and a member arranged for vertical movement with the presser roll for sustaining the outer side of the knife.
10. A leather skiving machine, having in combination, a gage roll arranged for movement about a stationary axis, a presser roll for holding the stock in engagement with the gage roll arranged for vertical yielding movement, a skiving knife arranged in advance of said rolls in the path of the stock, a stationary rest of permanent elevation for the inner side of the knife formed to permit swinging movement of the knife about said side as an axis and a member arranged for vertical movement with the presser roll for sustaining the outer side of the knife, said member and presser roll arranged for relative adjustment to adjust vertically the outer side of the knife.
11. In a leather skiving machine, the combination with a skiving knife and means for advancing the stock against said knife, of means for sustaining said knife constructed to maintain the inner side of the knife at a predetermined elevation and to raise and lower the outer side of the knife in accordance with the thickness of the stock operated upon by said advancing means, and a back stop for the knife arranged to have sliding engagement with the rear end of the knife.
12. A leather skiving machine, having in combination, a gage roll arranged for movement about a stationary axis, an arm mounted transverse to the line of feed of the stock, a presser roll carried by said arm, a knife for splitting the stock advanced by said rolls, a rest for the inner side of the knife formed to permit swinging movement of the knife about said side as an axis, and means carried by said arm in advance of the presser roll for sustaining the outer side of the knife constructed to compensate for difference in radius of said means and said presser roll in the pivotal movement of said arm.
13. A leather skiving machine, having in combination, a gage roll arranged for movement about a stationary axis, a presser roll for holding the stock in engagement with the gage roll arranged for vertical yielding

movement, a skiving knife arranged in advance of said rolls in the path of the stock, a stationary rest for the inner side of the knife formed to permit swinging movement
 5 of the knife about said side as an axis, a member arranged for vertical movement with the presser roll for sustaining the outer side of the knife, and means for yieldingly pressing said member against the side edge
 10 of the knife in the direction of the stationary rest whereby said knife is continuously gripped between said rest and said member during the vertical movement of the presser roll.

15 14. A leather skiving machine, having in combination, a gage roll arranged for movement about a stationary axis, a presser roll for holding the stock in engagement with the gage roll arranged for vertical yielding
 20 movement, a skiving knife arranged in the path of the work advanced by said rolls, an edge gage for positioning the inner edge of the work in proper relation to the skiving knife, a stripping knife arranged at the
 25 outer side of the gage roll for severing from a piece of stock a strip of predetermined width prior to the action of the skiving knife upon said strip, and a presser foot
 30 arranged between the stripping knife and the presser roll and supported for movement with the presser roll for compressing the stock along the line of cut produced by the skiving knife.

15 15. A leather skiving machine, having, in combination, a knife for splitting a strip
 35 of stock of predetermined width longitudinally into two beveled sections and trimming knives arranged upon opposite sides of the stock for trimming the beveled edges
 40 of the sections, said trimming knives having their cutting edges terminating substantially at the plane of the splitting knife.

16. A leather skiving machine, having, in combination, a knife, a gage roll and a
 45 presser roll arranged to advance the stock

against the knife and means actuated by the relative separating movement of said rolls for automatically controlling the position of the knife to cause the cut produced thereby to have a predetermined relation to
 50 the edges of the strip independently of variations in the thickness of the stock, said means being arranged for adjustment to vary the location of the cut produced by said knife, while maintaining the symmetry
 55 of the parts resulting from said cut.

17. A machine of the class described having, in combination, means for automatically splitting a strip of stock into two
 60 symmetrical portions irrespective of its thickness and means for varying the shape of the portions produced while maintaining their symmetry.

18. A machine of the class described having, in combination, a knife, a plurality of
 65 rolls for feeding a strip of stock thereto, connecting means between said knife and one of said rolls whereby the position of the knife is automatically controlled to cause said knife to split a strip of stock
 70 diagonally from corner to corner irrespective of its thickness and means for adjusting one of said rolls with respect to said knife.

19. A machine of the class described having, in combination, a plurality of rolls for
 75 feeding a strip of stock, a knife to which said stock is fed, a knife holder connected with the bearings of one of said rolls whereby the angle of the knife varies with the
 80 thickness of the stock, said knife holder being constructed to hold knives of different widths.

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

HENRY W. WINTER.

Witnesses:

BERNARD BARROWS,
 ALLAN H. BARROWS.

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