No. 681,347. Patented Aug. 27, 1901.

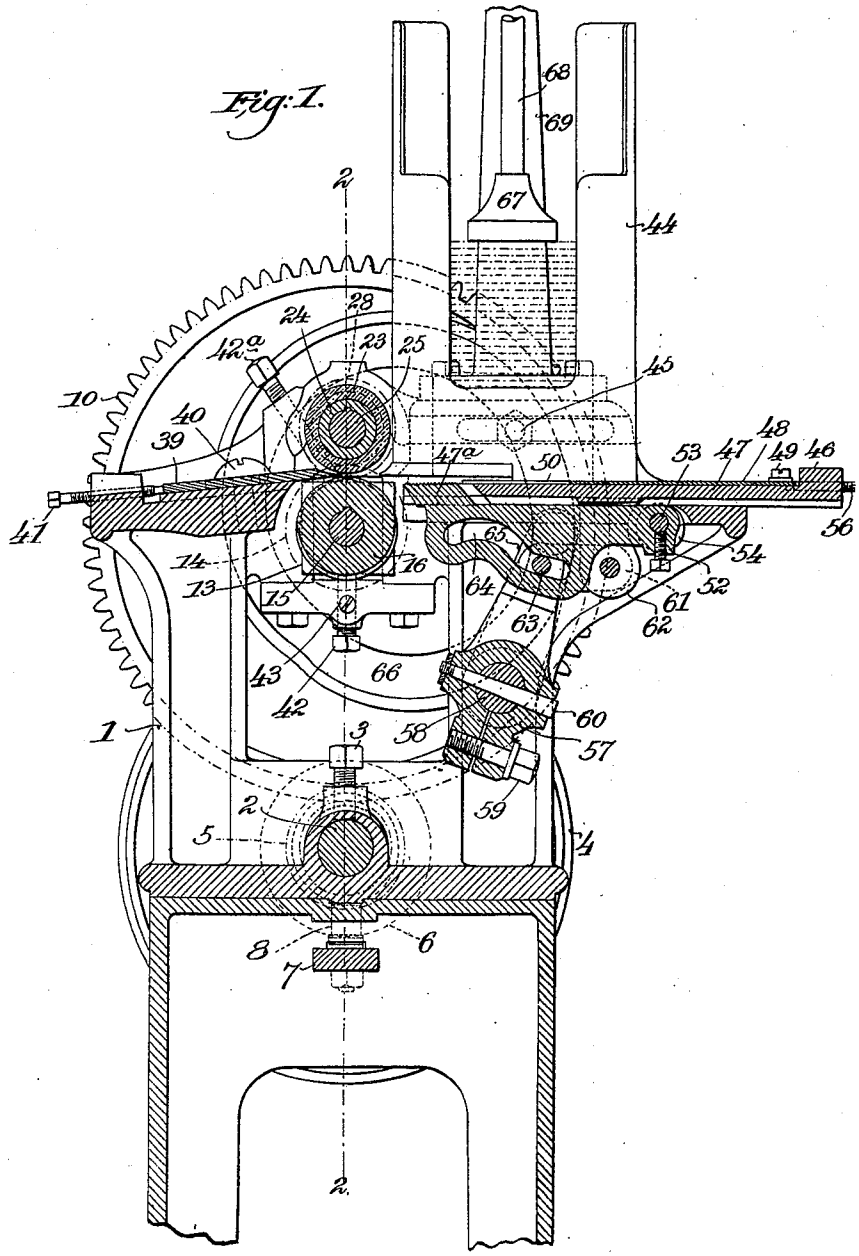
J. R. SCOTT.

LEATHER SKIVING MACHINE.

(Application filed Sept. 21, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



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by his Attorney
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(No Model.) 4 Sheets—Sheet 2.

Fig: 2.

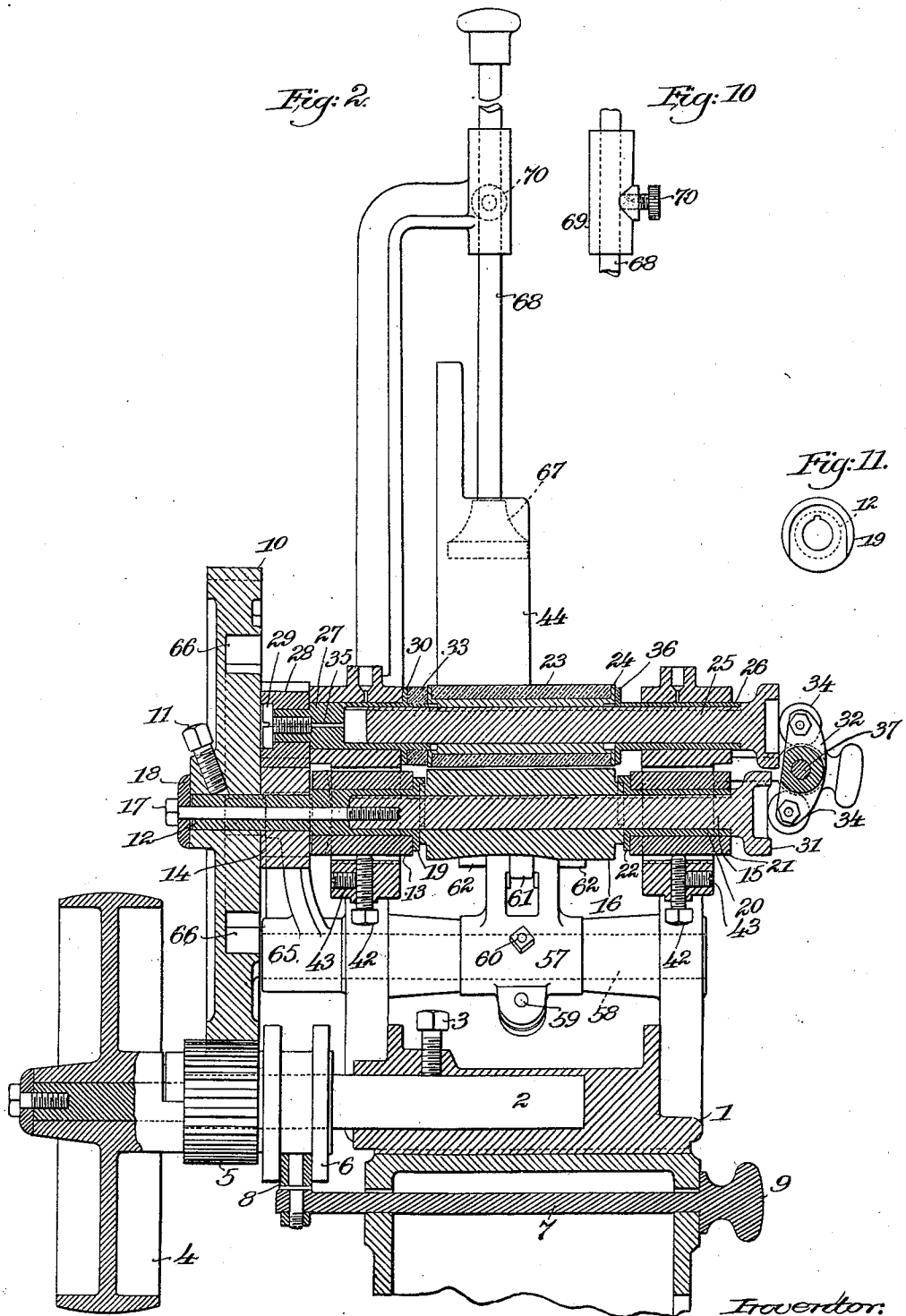


Fig: 10.

Fig: 11.

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(No Model.) 4 Sheets—Sheet 3.

Fig. 4.

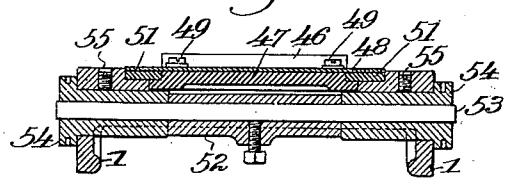


Fig. 5.

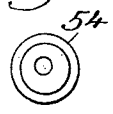
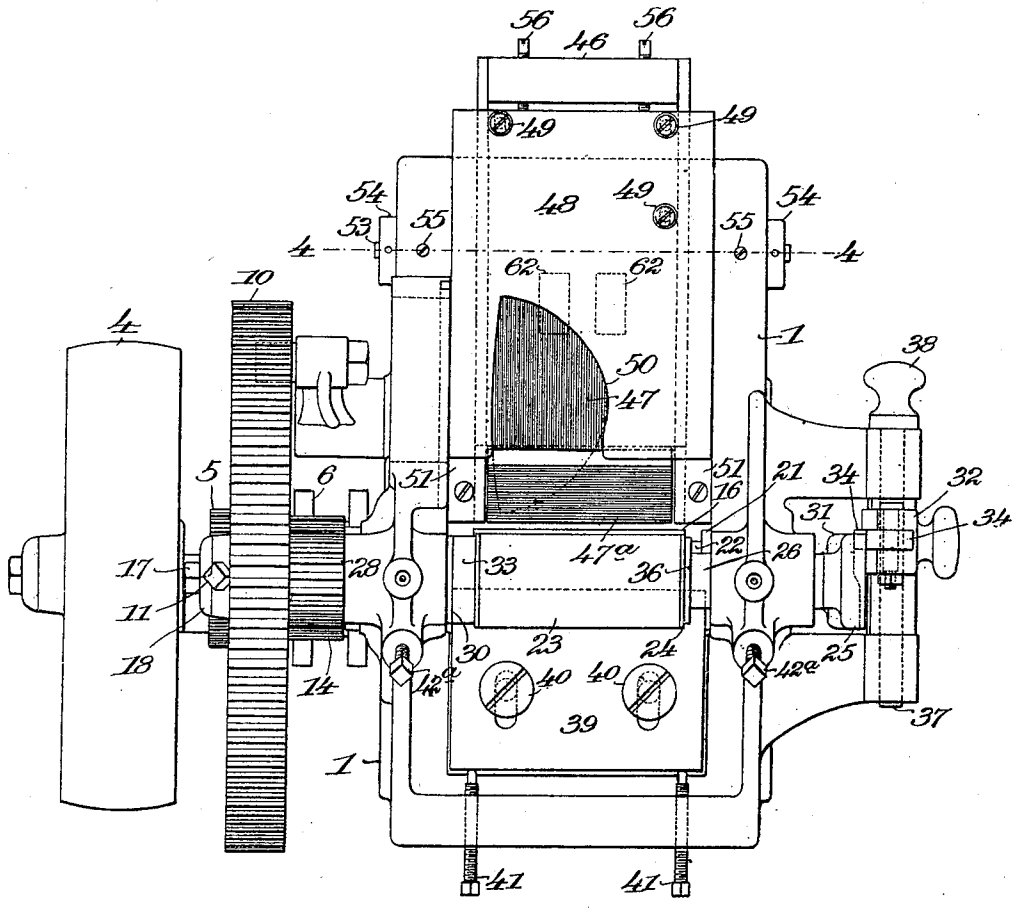


Fig. 3.



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(No Model.) 4 Sheets—Sheet 4.

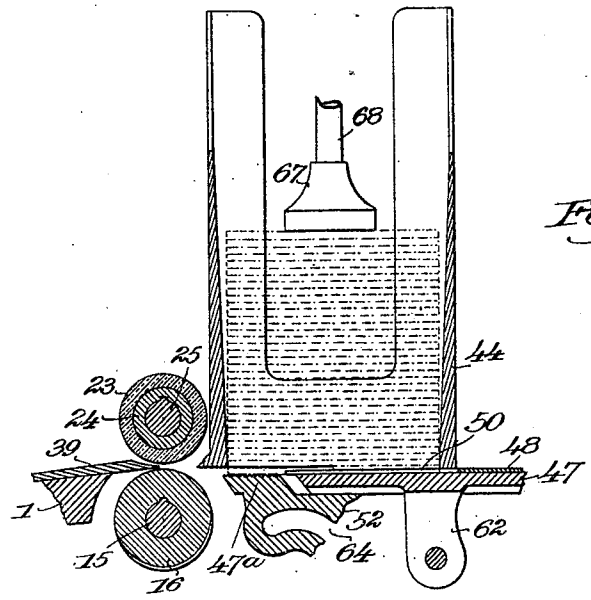


Fig. 6.

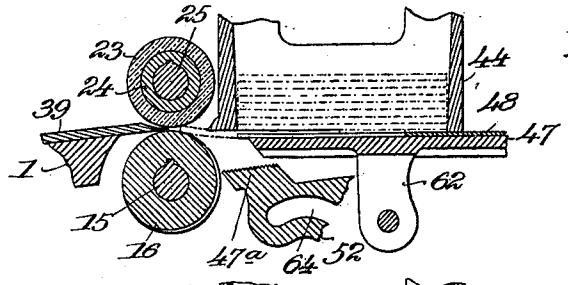


Fig. 7.

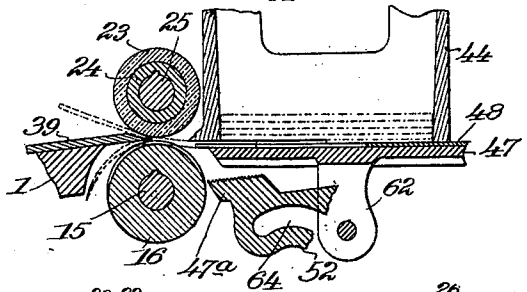


Fig. 8

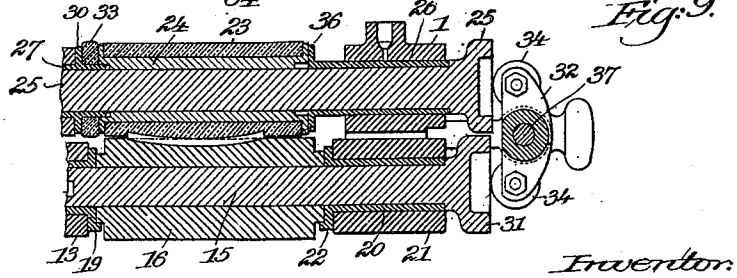


Fig. 9.

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UNITED STATES PATENT OFFICE.

JACOB R. SCOTT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY.

LEATHER-SKIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 681,347, dated August 27, 1901.

Application filed September 21, 1900. Serial No. 30,680. (No model.)

To all whom it may concern:

Be it known that I, JACOB R. SCOTT, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Leather-Skiving Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to leather-skiving machines, and more particularly to leather-skiving machines for producing shoe-counters, toe-pieces, or other similar articles.

In leather-skiving machines comprising a die and a coöperating pressure-roller difficulty has been experienced in forcing the blank into the die and firmly seating and holding it therein during the skiving operation. This difficulty is principally due to the fact that the edges of the blank are gripped between the surfaces of the die and pressure-roller and the central portion forced into the die-cavity by stretching the blank. As a result of such construction the pressure-roller often fails to force the blank to the bottom of the die. Moreover, as the blank is stretched in being forced into the die it has a tendency to resume its original flat condition immediately it is released from the action of the pressure-roller, and consequently rises from the die during its passage to the skiving-knife, which is necessarily situated at one side of the line of contact of the pressure-roller.

In my pending application, Serial No. 737,224, filed November 16, 1899, I have disclosed a construction for overcoming the defects above noted, comprising a die and a coöperating pressure-roller having a portion of its surface movable longitudinally of the roller-axis, whereby the edges of the blank are moved toward each other and the center of the blank slackened and allowed to conform to the die without any stretching action.

One of the objects of the present invention is to provide an improved and simplified construction for accomplishing this result; and with this object in view a feature of my invention consists in a die and a coöperating pressure-roller relatively movable endwise of the roller. By so moving the die and roller the edges of the blank are moved toward each other and the center of the blank slackened and bent into the die, as will hereinafter appear. The relative movement of the die and roller may be depended upon for forcing the blank to the bottom of the die. To insure this action, however, I prefer to make the surface of the pressure-roller of yielding material, which during the relative endwise movement of the die and roller will be displaced, yielding at certain points and bulging at others to press the blank firmly against the bottom of the die.

Another object of my invention is to provide means for imparting a preliminary bend to the blank prior to the action thereon of the pressure-roller, whereby the blank will be better adapted for conforming to the die; and with this object in view a feature of my invention consists in a leather-skiving machine having in combination a die and a pressure-roller and means for bending the blank to adapt it to conform to the die prior to its passage to the die and pressure-roller.

Another object of my invention is to provide an improved feeding mechanism for feeding the blanks to the die and pressure-roller, said mechanism being so constructed and timed with relation to the other parts of the machine that the blanks will be presented to the die and pressure-roller so as to register with the die; and with this object in view certain features of my invention consist in a skiving-machine provided with the feeding mechanism hereinafter described, and defined in the claims.

Other features of my invention consist in the devices and combinations of devices hereinafter described and claimed.

A preferred form of my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a machine embodying the same. Fig. 2 is a transverse sectional view on the line 2 2, Fig. 1. Fig. 3 is a plan view with the feeding-hopper removed. Fig. 4 is a detail sectional view on the line 4 4, Fig. 3. Fig. 5 is a view in end elevation of an adjustable bushing to be described. Figs. 6, 7, and 8 are sectional

views illustrating the action of the blank-feeding mechanism. Fig. 9 is a detail sectional view showing the die and presser-rollers in position in the machine, the view being similar to Fig. 2 and taken on the same line as said figure with the rollers turned through half a revolution and with a blank passing between the rollers. Figs. 10 and 11 illustrate details of construction to be described.

Referring to the drawings, in which like characters of reference indicate like parts, 1 indicates the frame of the machine, of any construction suitable for supporting the operating parts, and 2 a shaft or stud rigidly secured in a hole in the frame by a screw 3.

The shaft 2 has loosely mounted thereon a driving-pulley 4 and a pinion 5, provided with clutching members, the pinion 5 being also provided with a grooved collar 6, secured thereto or formed integral therewith. For sliding the pinion along the shaft to engage or disengage the clutch members a slide 7 is mounted in the frame, provided at one end with a roller 8, engaging the groove of the collar 6, and at the other end with a knob or handle 9. The pinion 5 meshes with a gear-wheel 10, secured, by means of a set-screw 11, to the outer end of a short shaft 12, journaled in a bearing-block 13, mounted in suitable guideways in the frame. A pinion 14 is secured to the shaft 12 between the gear 10 and the block 13 by means to be presently described. The inner end of the shaft 12 is bored axially to receive the end of the shaft 15 of the die-roller 16, the shafts being secured together by means of a bolt 17, extending axially through the shaft 12 and screwing into the end of the shaft 15. A washer 18, interposed between the head of the bolt and gear 10, serves to press the gear 10 against the pinion 14 and the pinion 14 against a shoulder on the shaft 12. The shaft 12 is held from longitudinal movement by means of the pinion 14 and a flange 19 at the inner end of the shaft. The other end of the shaft 15 is supported in a sleeve 20, journaled in a bearing-block 21 in guideways in the frame. The inner end of the sleeve 20 is provided with a flange 22, and the outer end of the sleeve bears against a shoulder formed by the enlarged end of the shaft 15. The die-roller 16 is supported on the shaft 15 between the flanges 19 and 22, and it will be evident that by unscrewing the bolt 17 the shaft 15 may be withdrawn and the die-roller removed. The shaft 15 is provided with a spline, which engages slots in shaft 12, die-roller 16, and sleeve 20 to cause the parts to rotate in unison and to insure the placing of the parts in correct position in replacing the die-roller after removal. To facilitate the replacing of the die-roller in its proper position relative to the other parts of the machine and also as a means for preventing the die-roller from dropping out of the machine except when the shaft 12 and sleeve 20 are in a certain position, I provide the flanges 19 and 22 with suitable seats or recesses adapted to receive the reduced ends of the die-roller, as is clearly shown in Figs. 2 and 11.

Coöperating with the die-roller 16 is a pressure-roller 23, herein shown as comprising a sleeve 24, provided with a covering of flexible or yielding material, such as rubber. The pressure-roller is mounted on a shaft 25, supported at one end in a sleeve 26, journaled in a bearing in the frame above the bearing-block 21, and at the other end in a hole bored in the inner end of a short shaft 27, journaled in the frame above the bearing-block 13. The shaft 25 is provided with a spline engaging slots in the shaft 27 and sleeves 24 and 26. As a means for rotating the pressure-roller a pinion 28, meshing with the pinion 14, is secured to the end of the shaft 27 by means of a screw 29, which presses the pinion against a shoulder of the shaft. The shaft 27 is held in its bearing between the pinion 28 and a flange 30 at the inner end of the shaft.

For producing a relative movement of the pressure-roller and die longitudinally of the axis of the pressure-roller I provide means for moving the pressure-roller endwise, such means consisting of a cam 31 at the end of the die-roller shaft and a lever 32, having one end engaging the cam 31 and the other end engaging the end of the shaft 25 of the pressure-roller. A soft-rubber ring 33 interposed between the flange 30 of the shaft 27 and the end of the sleeve 24 acts upon the roller in opposition to the cam and lever. Friction-rollers 34 are provided at each end of the lever to bear against the cam 31 and the end of shaft 25. To allow the end of shaft 25 to reciprocate freely in the hole in the shaft 27, a vent-opening 35 is provided in shaft 27 and screw 29. The pressure-roller is held on the shaft 25 between the rubber ring 33 and a flange 36 at the inner end of the sleeve 26. The outer end of sleeve 26 engages a shoulder formed by the enlarged outer end of the shaft 25. As a result of the construction above described the pressure-roller will be moved endwise with the shaft 25, a portion of the sleeve 24 being cut away, as shown in Fig. 2, to allow the sleeve to move over the end of the shaft 27. By moving the shaft 25 endwise to the right, as viewed in Fig. 2, the shaft can be withdrawn from the sleeve 24 of the pressure-roller and the roller removed from the machine. To allow the withdrawal of the shaft 25 and also of the shaft 15, the pivot-pin 37 of the lever 32 is provided with a knob or handle 38, by means of which it may be withdrawn and the lever 32 removed from the path of the shafts.

Referring to Figs. 1 and 3, 39 designates the skiving-knife, firmly held to its seat on a transverse portion of the frame by means of the screws 40, passing through slots in the knife and engaging screw-threaded holes in the frame. Screws 41, bearing against the back of the knife, serve as a means for ad-

justing the knife-edge toward the line of contact of the rollers.

As a means for varying the thickness of the article produced I provide means for adjusting the die-roller toward and from the knife and pressure-roller, such means consisting of adjusting-screws 42 and 42ª, bearing against the upper and lower sides of the bearing-blocks 13 and 21, locking-screws 43 being provided for locking the screws 42 in position after adjustment.

The bearing-blocks 13 and 21 in addition to being adjustable toward and from the pressure-roller can also rock slightly in their guideways, as will be evident from an inspection of Fig. 2, whereby one end of the die-roller may be adjusted independently of the other and the roller set at an angle to the edge of the knife to produce an article thicker at one edge than at the other. In the construction above described it will be seen that the pressure-roller is mounted in fixed bearings, the skiving-knife is seated on a fixed part of the frame, and the only adjustment for varying the thickness of the articles produced is the adjustment for the die-roller. A simple and reliable means for adjustment is thus provided and the liability of the parts being improperly set in making the adjustment is reduced to a minimum.

In the operation of the mechanism above described the die and pressure rollers are designed to rotate continuously, and for presenting the blanks to the rollers at the proper time in their revolution to cause the blanks to register with the die in the die-roller I provide a feeding mechanism which will now be described.

Mounted on the frame of the machine at one side of the die and pressure-rollers is a blank-receiving hopper 44, comprising front and rear standards or walls shaped to fit the ends of the blanks and connecting side portions at the bottom of the standards, the whole being preferably cast in a single piece. The hopper is secured to the frame so as to be adjustable toward and from the pressure and die rollers by means of a bolt 45ª passing through a slot in the frame and screwing into the side of the hopper, as is shown in dotted lines in Fig. 1. The bottom of the hopper is formed by a reciprocating feed-slide 46 and a vertically-movable table or support 47ª. The feed-slide 46 consists of a table or plate 47, provided with longitudinal grooves on its upper surface for a purpose which will hereinafter appear, and a plate 48 of less thickness than that of a blank secured to the table 47 by screws 49 and provided at its forward end with a blank-receiving opening 50. This opening constitutes a blank-carrier, the rear portion of which is shaped to fit the blank and the front portion or discharge-opening of which is of less width than the blank for a purpose to be described. The guides for the feed-slide consist of plates 51, screwed to the side portions of the frame and extending inwardly therefrom, as is shown in Fig. 4. These guides are received between the projecting edges of the plate 48 and flanges on the plate 47.

The vertically-movable table 47ª is carried at the end of a lever 52, pivoted to the frame of the machine below the feed-slide 46. The pivot 53 of the lever 52 is mounted eccentrically in adjustable sleeves 54, as is shown in Figs. 4 and 5. By rotating the sleeves the pivot 53 can be raised or lowered and thereby the height to which the table 47ª is raised by its actuating mechanism adjusted to suit different thicknesses of blanks, as will be described. Screws 55 serve to lock the sleeves 54 in adjusted position.

For adjusting the plate 48 with relation to the plate 47 screws 56, bearing against the rear edge of the plate 48, may be provided, slots in the plate 48, through which the screws 49 pass, allowing this adjustment.

The mechanism for actuating the feed-slide and vertically-movable table consists of a forked arm 57, the split sleeve of which is secured to a shaft 58 by means of a clamping-screw 59 and pin 60, links 61 connecting the arm 57 with lugs 62, projecting downwardly from the plate 47 of the feed-slide, pin 63, carried by the arm 57, engaging a curved slot 64 in the lever 52, arm 65, secured to the shaft 58, and cam-groove 66 in the gear-wheel 10. For forcing the blanks downward through the hopper a presser 67 is provided, carried at the lower end of a rod 68, sliding in a bearing formed in an overhanging arm 69, secured to the machine-frame. A screw 70 serves to lock the presser in elevated position when it is desired to refill the hopper or to force the blanks through the hopper manually.

The operation of the machine above described is as follows: A pile of blanks having been placed in the hopper and the parts being in the position shown in Figs. 1 and 6, the slide 7 is actuated to throw the machine into operation. As the gear-wheel 10 revolves the cam-groove 66, carried by the gear, will through the described connections cause the feed-slide 46 to move forward and force the bottom blank, which is seated in the blank-carrier 50 of the slide, over the table 47ª and beneath the front wall of the hopper into the bite of the pressure and die rollers. As will be seen in Fig. 6, which shows the feed-slide in its extreme rearward position, the rear portion of the blank-carrier 50 is back of the rear edge of the pile of blanks in the hopper. As the feed-slide moves forward the bottom blank is held from movement by the table 47ª until the blank is firmly seated against the rear portion of the blank-carrier 50. To insure this holding action of the table 47ª, I preferably provide its upper surface with traverse-grooves, as shown. In addition to its holding function the table 47ª when in its raised position acts to support the forward end of the pile of blanks, with the bottom

blank in position to be fed from the hopper and with the next blank above the lower edge of the front wall of the hopper. By this means the feeding of a single blank at a time is insured. By rotating the sleeves 54, in which the pivot of the lever 52, carrying the table 47ª, is eccentrically mounted, the pivot can be raised or lowered to thereby swing the lever about the pin 63 as a fulcrum and adjust the height of the table to different thicknesses of blanks. The slot 64 in the lever 52 is of such a shape that the table 47ª is held in its raised position by the pin 63 during the first part of the forward movement of the feed-slide and until the forward end of the blank has been projected through the feed-slot formed by the table 47ª and the front wall of the hopper. During the continued forward movement of the feed-slide the pin 63, traveling in the slot 64, lowers the table 47ª and allows the feed-slide to advance and force the blank between the die and pressure rollers. As the bottom blank is removed from the pile the overlying blanks are supported by the plate 48 of the feed-slide until in its backward movement the slide reaches the position shown in Fig. 6, when the next blank is forced into the carrier 50. The blanks are also supported in the hopper by the next to the bottom blank being forced against the front wall of the hopper by its frictional engagement with the bottom blank during the forward movement of the feed-slide and by being forced against the rear wall of the hopper by its frictional engagement with the plate 48 during the backward movement of the slide. As will be seen in Fig. 8, the feed-slide is in close proximity to the die and pressure rollers when in its forward position, and it remains in this position while the blank is being drawn from the carrier by the rollers. The blank is thus supported during its passage to the rollers and the carrier acts as a guide for the blank and prevents its lateral displacement. The longitudinal grooves in the plate 47 also aid in preventing such displacement. As has been stated, the discharge-opening of the blank-carrier is of less width than the blank, the object of this construction being to impart a preliminary bending to the blank, adapting it to enter the die by forcing the edges of the blank toward each other in passing through the opening. In this connection it is to be noted that the lower edge of the front wall of the hopper is on a line with the top of the die-roller and that as a consequence the blank is bent upwardly in passing from the blank-carrier to the roller. This bending action also facilitates the final forcing of the blank into the die. The feeding mechanism is so timed with relation to the die-roller that the blank registers with the die and is seated therein in passing between the die and pressure rollers. During the rotation of the rollers the pressure-roller is moved endwise by the mechanism hereinbefore described, and thereby acts to move the edges of the blank toward each other, one edge being seated and firmly held in the die by the pressure-roller and the other edge being moved with the roller to thereby slacken the central portion of the blank and bend it toward the bottom of the die. In case the surface of the pressure-roller is made of yielding material portions of such surface will be displaced, yielding at the edges of the blank and bulging at the center, and thereby forcing the blank firmly against the bottom of the die, as will be evident from an inspection of Fig. 9. From the die and pressure rollers the blank passes to the skiving-knife, which is arranged slightly to one side of the line of contact of the rollers, and as the blank has not been subjected to any stretching action it will not rise from the die before reaching the knife, and a perfect article the shape of the die will be produced.

The machine above described embodies the several features of my invention in their preferred form; but it is to be understood that they are not limited to the construction shown and described, but may be embodied in many different forms.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A leather-skiving machine, having, in combination, a die, a pressure-roller and means for moving the pressure-roller endwise, substantially as described.

2. A leather-skiving machine, having, in combination, a die-roller, an endwise-movable pressure-roller, means for rotating the die and pressure rollers, and means for moving the pressure-roller endwise during such rotation, substantially as described.

3. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller and means actuated by the die-roller for moving the pressure-roller endwise, substantially as described.

4. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller and means for moving the pressure-roller endwise, comprising a cam on the die-roller and a lever actuated by the cam engaging the feed-roller, substantially as described.

5. A leather-skiving machine, having, in combination, a die, a pressure-roller, and means for imparting a relative endwise movement to the die and roller, substantially as described.

6. A leather-skiving machine, having, in combination, a die, a pressure-roller provided with a yielding surface and means for imparting a relative endwise movement to the die and roller, substantially as described.

7. A leather-skiving machine, having, in combination, a die, a pressure-roller, means for relatively actuating the die and roller to cause the roller to travel over the die, and means for imparting a relative endwise movement to the die and roller during such travel, substantially as described.

8. A leather-skiving machine, having, in combination, a die, means for forcing a blank into the die and means for bending the blank before it enters the die, substantially as described.

9. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller for forcing a blank into the die of the die-roller, and means for bending the blank to adapt it to conform to the die before it enters the bite of the rollers, substantially as described.

10. A leather-skiving machine, having, in combination, a die, a pressure-roller, means for moving the pressure-roller endwise to bend the blank into the die, and means for bending the blank to adapt it to conform to the die prior to the action of the pressure-roller substantially as described.

11. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller, a feed-slide provided with a blank-carrier having a discharge-opening of less width than the blank and means for actuating the feed-slide, substantially as described.

12. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller, a support for the forward end of a pile of blanks movable toward and from the bottom of the pile, a feed-slide for feeding the bottom blank over the support into the bite of the rollers and means for actuating the slide and support, substantially as described.

13. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller, a hopper, a support for the forward end of a pile of blanks in the hopper movable toward and from the bottom of the pile, a feed-slide for feeding the bottom blank over the support into the bite of the rollers, means for adjusting the support toward and from the bottom of the pile, and means for actuating the slide and support, substantially as described.

14. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller, a feed-slide provided with a blank-carrier, fitting the rear portion of the blank forming a guide for the blank in passing from the carrier to the rollers and means for actuating the slide to move the carrier in proximity to the rollers, substantially as described.

15. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller, a feed-slide provided with a carrier for receiving and supporting a blank, a support for the front portion of the blank, means for actuating the slide to move the carrier in proximity to the rollers, and means for moving the support from the path of the slide, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB R. SCOTT.

Witnesses:
ALFRED H. HILDRETH,
FRED O. FISH.