No. 760,025. PATENTED MAY 17, 1904.

J. R. SCOTT.

LEATHER SKIVING MACHINE.

APPLICATION FILED FEB. 27, 1901. RENEWED DEC. 10, 1903.

NO MODEL. 6 SHEETS—SHEET 1.

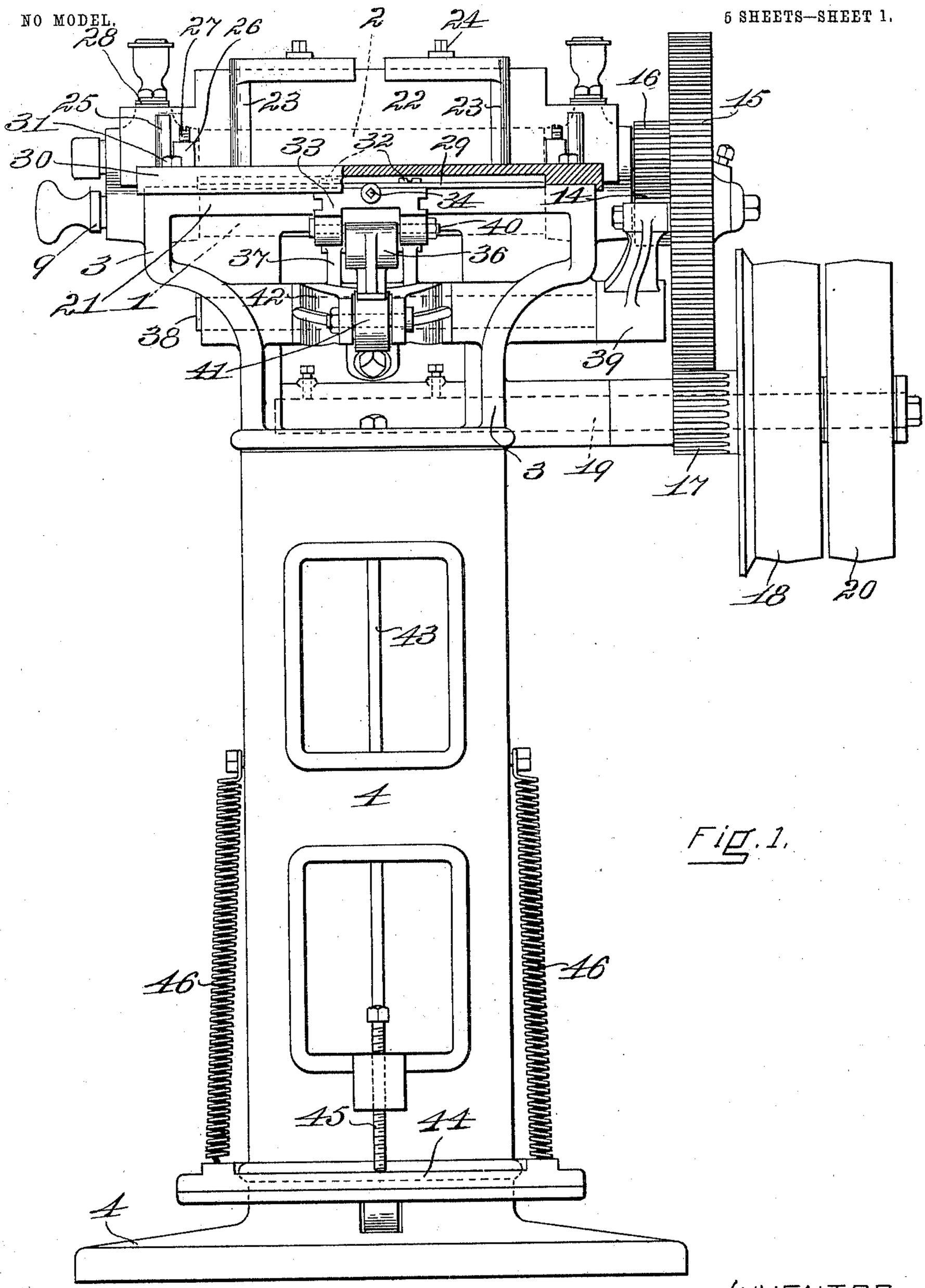

Fig. 1.

WITNESSES.
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NO MODEL. 5 SHEETS—SHEET 2.

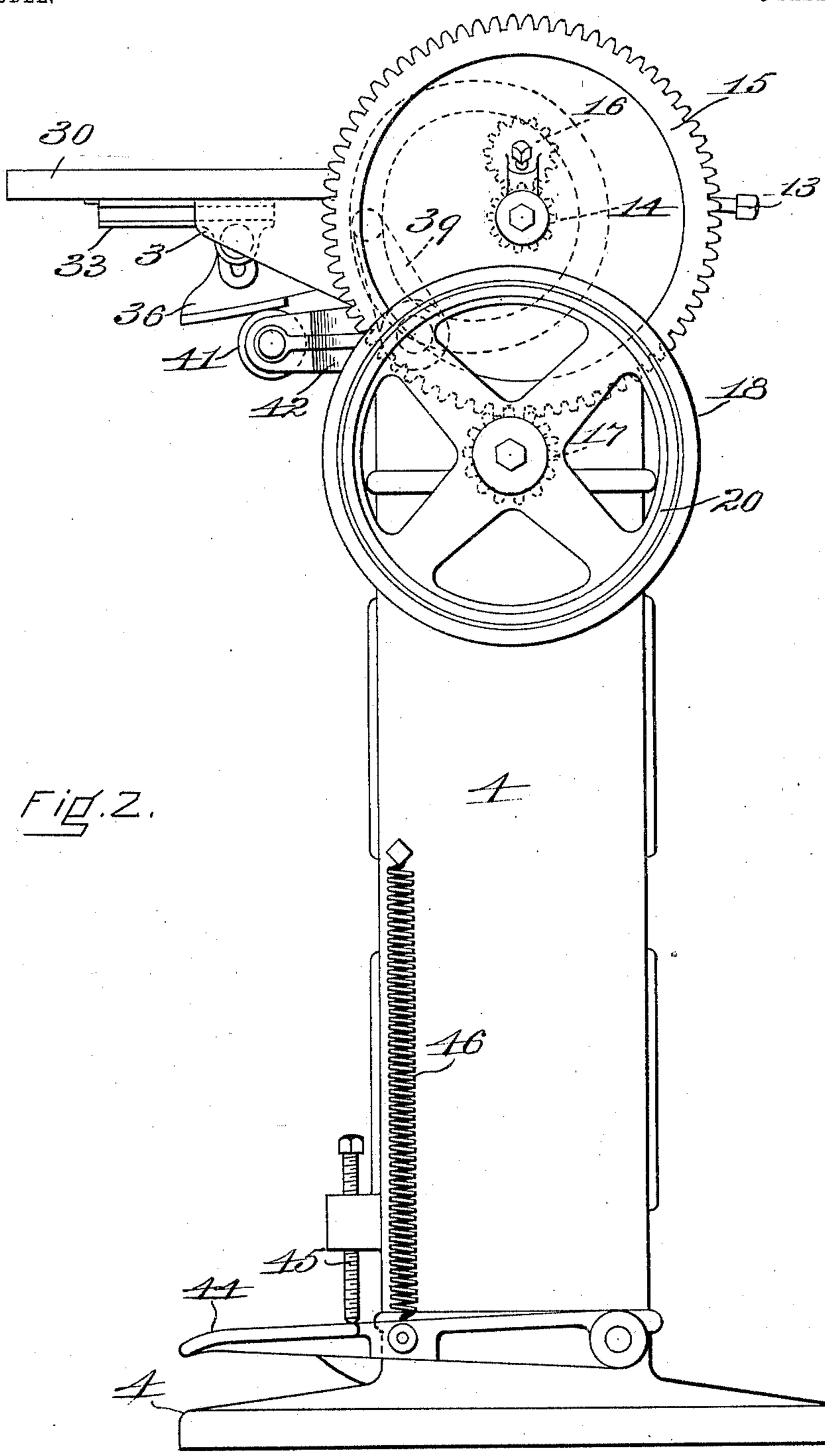

Fig. 2.

WITNESSES

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NO MODEL. 5 SHEETS—SHEET 3.

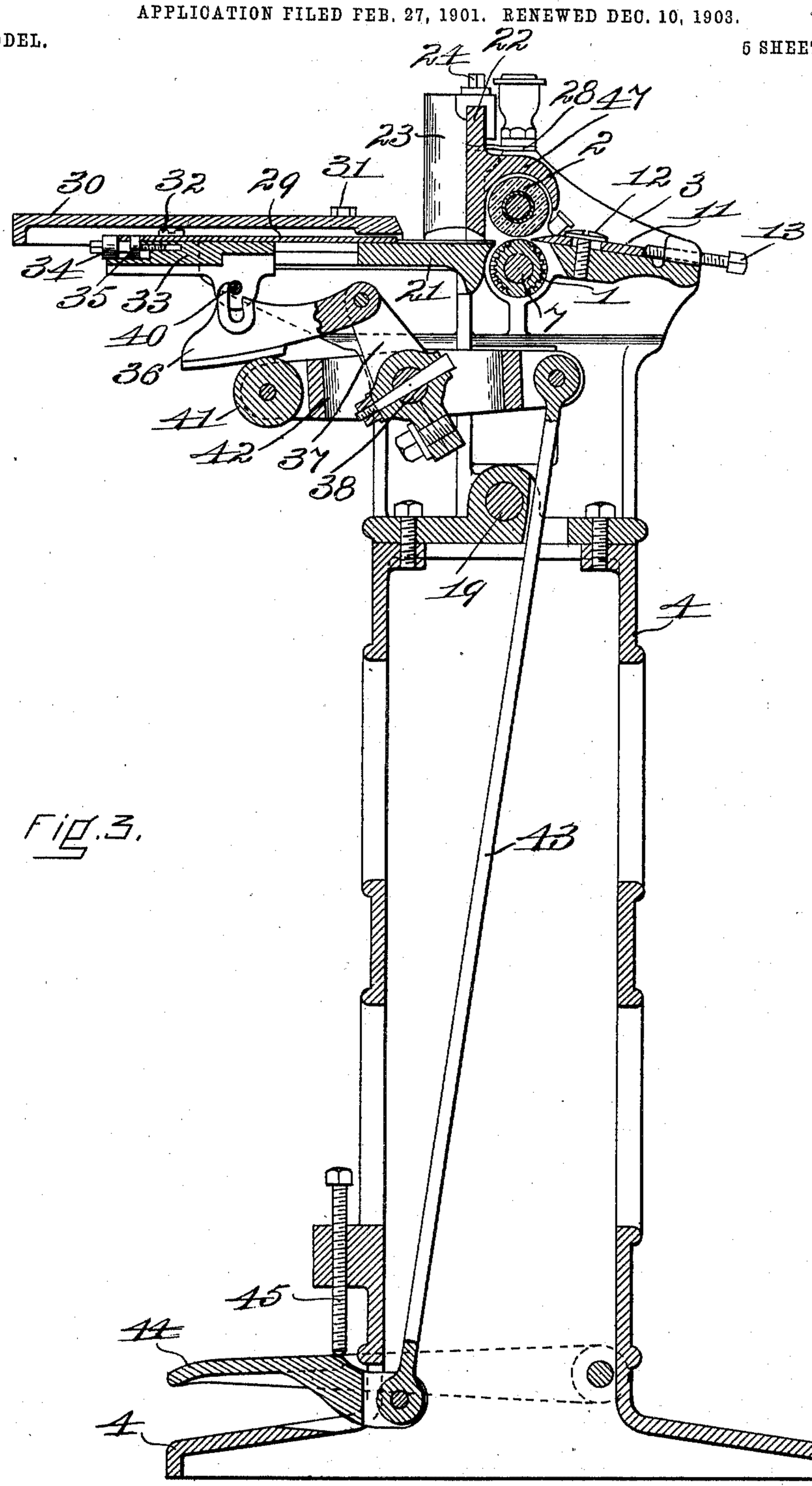

Fig. 3.

WITNESSES

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NO MODEL. 5 SHEETS—SHEET 4.

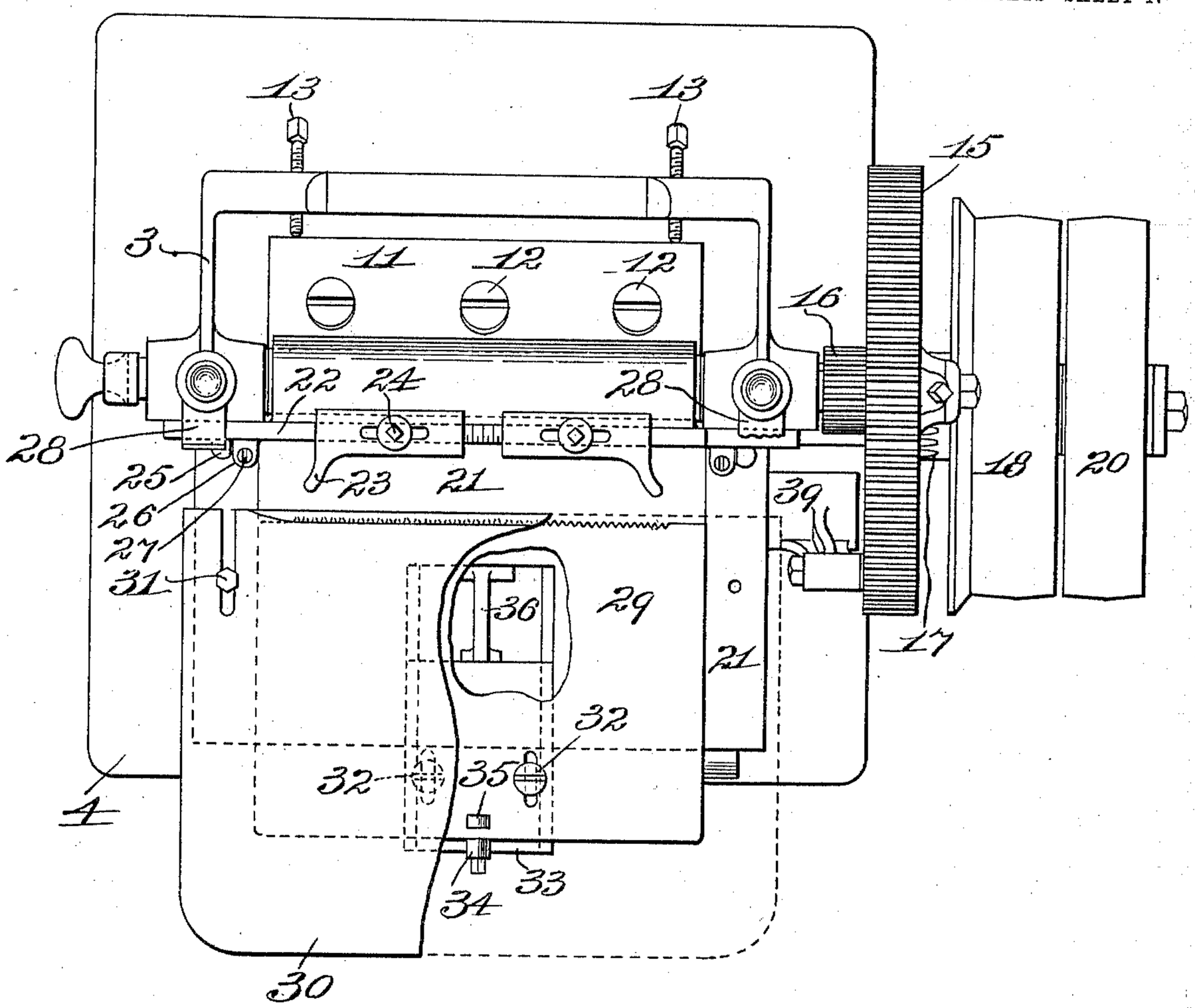

Fig. 4.

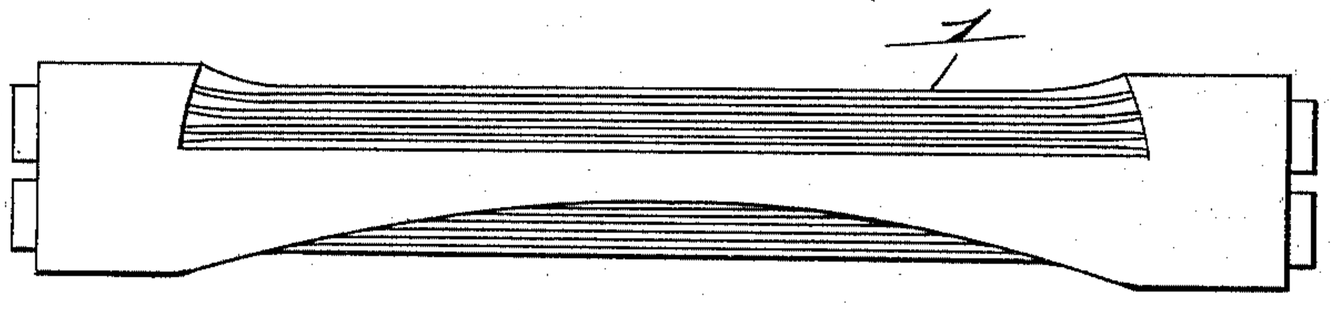

Fig. 5.

WITNESSES

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NO MODEL. 5 SHEETS—SHEET 5.

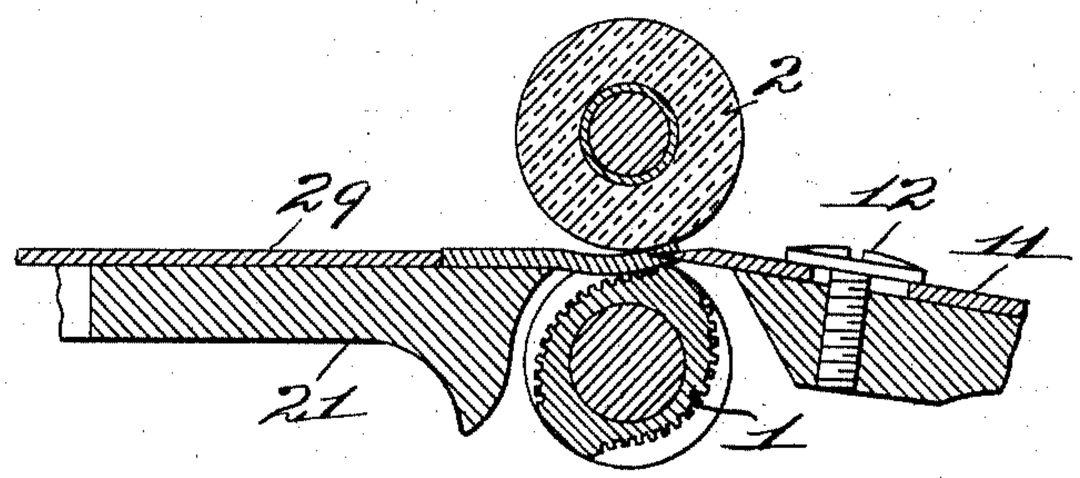

Fig. 6.

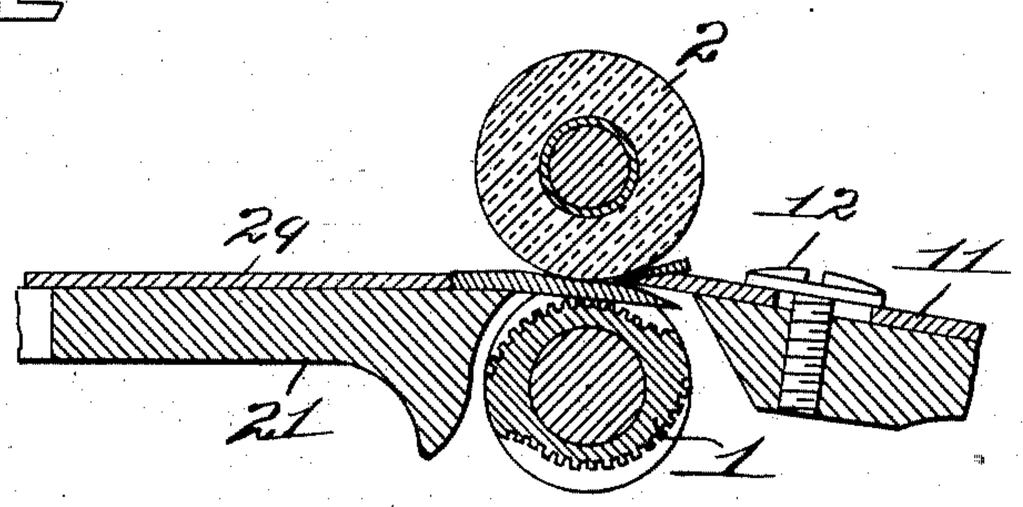

Fig. 7.

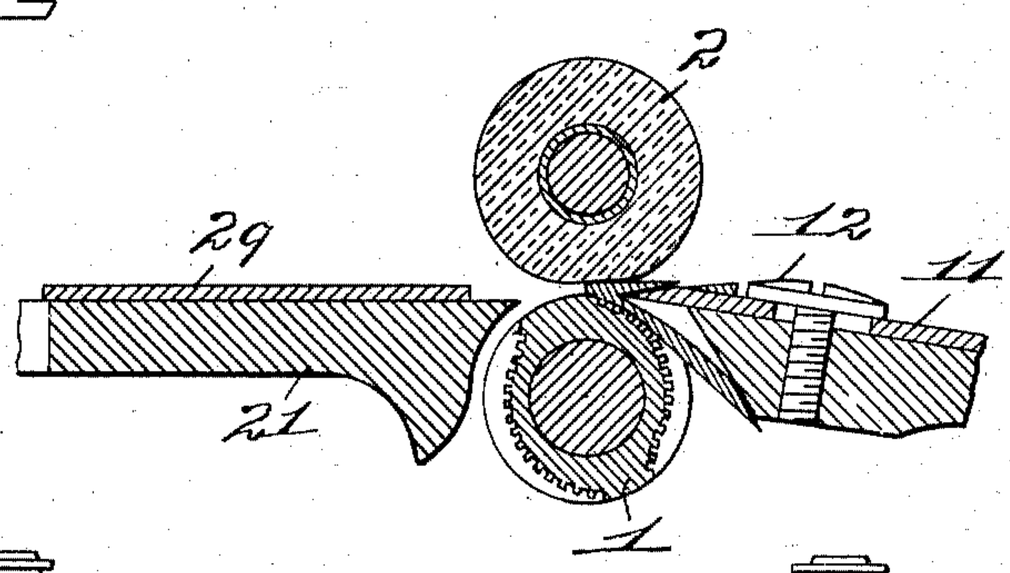

Fig. 8.

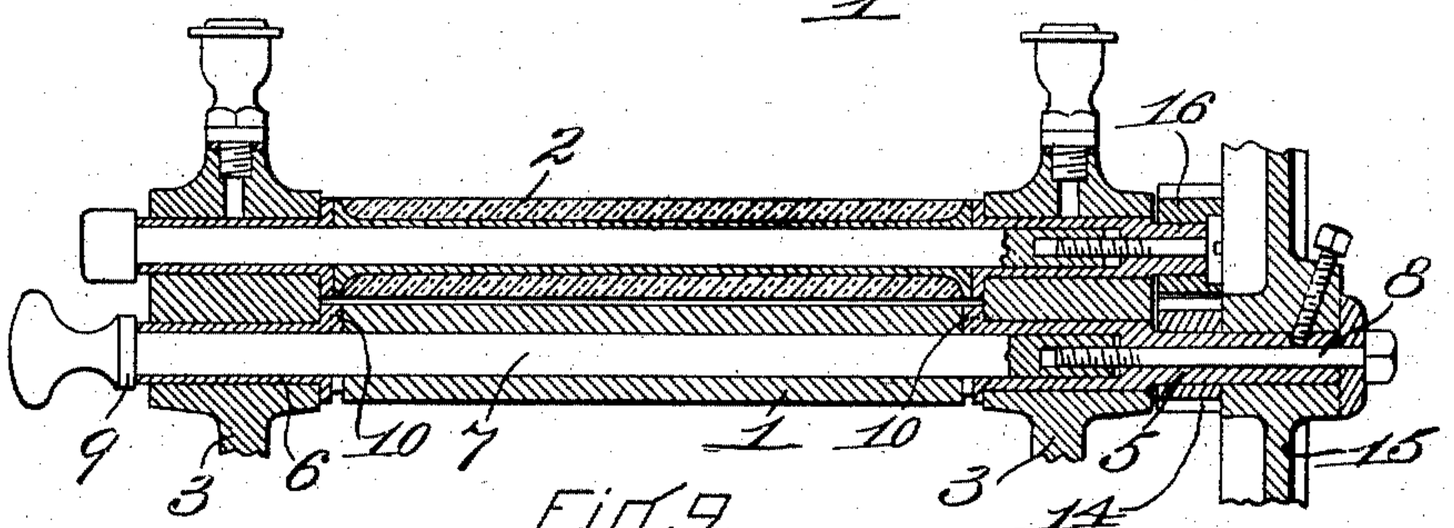

Fig. 9.

WITNESSES
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No. 760,025. Patented May 17, 1904.

UNITED STATES PATENT OFFICE.

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

LEATHER-SKIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 760,025, dated May 17, 1904.

Application filed February 27, 1901. Renewed December 10, 1903. Serial No. 184,679. (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.

The present invention relates to leather-skiving machines for producing articles of leather, such as shoe-counters, toe-pieces, and similar articles.

In leather-skiving machines provided with a die-roller and a coöperating pressure-roller or other suitable pressure device the blank must be firmly seated against the bottom of the die-cavity and held therein during the skiving operation in order that an article the exact shape of the die may be produced. When such machines are provided with mechanism for feeding the blanks to the rolls, the feeding mechanism must be constructed and arranged to feed the blanks so that they register with the die-cavity in the die-roller. In a commercially practical machine the blank must be prevented from displacement in being presented to the die-cavity and the feeding mechanism must be certain in operation.

The object of the present invention is to provide a machine of the type referred to of improved and simplified construction and mode of operation in which the blanks are fed with certainty to the die-cavity of the die-roller and are firmly seated against the bottom of the die-cavity and held therein during the skiving operation.

My invention is intended, primarily, as an improvement on the machine disclosed in my pending application, Serial No. 30,679, filed September 21, 1900; but it is not limited to such machine, but may be embodied in other forms of leather-skiving machines.

In accordance with my present invention I cause the blank to be forced into and seated against the bottom of the cavity in the die-roller by the action of the feeding mechanism, which is so timed with relation to the rotation of the die-roller that the blank is fed into the bite of the die-roller and pressure device and then bent into the die-cavity. During the passage of the first half of the blank between the die-roller and pressure device the bottom of the die-cavity is receding from the pressure device, and during the passage of the last half of the blank the bottom of the die-cavity is rising toward the pressure device. It is therefore necessary to bend the blank only during the passage of the first half of the blank between the die-roller and pressure device. The pressure device preferably consists of a roller, and the feeding mechanism is preferably arranged to act on the blank only while the first half is passing through the rollers, the last half of the blank being fed forward by the action of the rollers alone. My invention, however, is not limited to such an arrangement, but consists, broadly, in a feeding mechanism arranged to feed a blank into the bite of a die-roller and pressure device and to bend the blank into the die-cavity.

In order to reduce the number of parts which must be replaced by parts of a different size or shape to adapt the machine for operation upon blanks of different sizes or shapes and upon stock of different thickness, and thereby reduce the number of extra parts which must be kept on hand, as well as to facilitate changes in the machine and adapt it for use under such varying conditions, a feature of my invention consists in providing the die-roller with a plurality of die-cavities and in providing means whereby the roller and feeding mechanism can be relatively adjusted to bring any die-cavity and the feeding mechanism into coöperative relation.

It is often desirable to stop the operation of the feeding mechanism for various reasons, as to prevent the feeding to the rollers of a blank which is not in proper position or to allow the operator to adjust a pile of blanks in the hopper, and in order to accomplish this result a feature of my invention consists in the means hereinafter described and claimed for throw-

ing the feeding mechanism out of operation without stopping the machine. By throwing the feed mechanism only out of operation the jar and strain on the parts incident to stopping and starting the entire machine is avoided and the operation of the machine can be readily and quickly controlled by the operator.

Other features of my invention consist in an improved construction of hopper and in an improved mechanism for feeding the blanks from the hopper.

My invention also consists in the devices and combinations of devices hereinafter described and claimed having the advantages hereinbefore set forth and other advantages which will be obvious to those skilled in the art.

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

Figure 1 is a view in side elevation, partly in section, of a counter-skiving machine embodying the same. Fig. 2 is a view in end elevation of the machine shown in Fig. 1. Fig. 3 is a sectional view taken on a plane passing through the center of the machine. Fig. 4 is a plan view of the machine, portions being broken away to show the underlying parts. Fig. 5 is a detail view of the die-roller detached. Figs. 6, 7, and 8 are detail sectional views illustrating the manner in which the blank is forced into and firmly seated against the bottom of the die-cavity of the die-roller and securely held therein during the skiving operation. Fig. 9 is a detail sectional view showing the manner in which the die-roller and pressure-roller are removably mounted.

Referring to the drawings, 1 indicates the die-roller, and 2 the pressure-roller, which are rotatably mounted in the upper part of the frame 3 of the machine supported on a hollow standard 4. The die-roller and pressure-roller are of substantially the same construction as the rollers disclosed in my pending application above referred to and are removably mounted in the same manner. The construction by which the rollers are removably mounted is illustrated in Fig. 9, in which 5 designates a short shaft journaled in the machine-frame at one end of the die-roller, and 6 designates a sleeve journaled in the machine-frame at the other end of the die-roller. The inner end of the shaft 5 is bored axially, so that the inner end of the shaft in effect constitutes a sleeve. The sleeve 6 and sleeve formed by the inner end of the shaft 5 are provided with flanges, and between the flanges the die-roller 1 is supported by means of the shaft 7, which passes through the sleeve 6 and through the die-roller and extends into the sleeve at the inner end of shaft 5. A screw-threaded rod 8 passes axially through the shaft 5 and extends into the sleeve at the inner end of the shaft. The end of the shaft 7 has a screw-threaded engagement with the rod 8 and at its outer end is provided with a flange 9, which bears against the outer end of the sleeve 6, so that a rotation of the shaft 7 forces the sleeve 6 against the die-roll 1 and the die-roll against the sleeve at the inner end of shaft 5 and securely locks these parts together. By rotating the shaft 7 in the opposite direction the shaft can be withdrawn and the die-roller removed. To insure the rotation of the die-roller with the shaft 5 and the rotation of the sleeve 6 with the die-roller and also to facilitate the replacing of the die-roller with the die-cavity in proper position with relation to the other parts of the machine, the ends of the die-roller are provided with slots which are engaged by projections 10 of the flanges of the sleeve 6 and shaft 5. The construction for supporting the pressure-roller is the same as that already described for supporting the die-roller and will be readily understood without further description.

To the outer end of the shaft 5 is secured a pinion 14 and a large gear 15. The pinion 14 meshes with a pinion 16, secured to the shaft to which the pressure-roller is locked, so that the die-roller and pressure-roller rotate in unison. The gear 15 meshes with a pinion 17, secured to the hub of a driving-pulley 18, mounted to rotate loosely upon a horizontal rod or shaft 19, secured in the lower part of the frame 3. An idle pulley 20 is mounted to rotate loosely on the shaft 19 beside the pulley 18.

The gearing above described serves as a means for continuously rotating the die and pressure rollers so long as the driving-belt remains on the pulley 18.

11 designates the skiving-knife, which is adjustably secured on a transverse portion of the machine-frame by means of screws 12, which pass through slots in the knife. Screws 13, passing through the frame of the machine and bearing against the rear edge of the knife, serve as a means for adjusting the cutting edge of the knife toward and from the line of contact of the rollers.

Located on the opposite side of the die and pressure rollers from the skiving-knife 11 is a horizontal feed-table 21, the forward end of which conforms to the periphery of the die-roller, so that the front edge of the feed-table extends in close proximity to the line of contact of the rollers. Located above the feed-table 21 is a hopper for receiving and holding a pile of blanks. This hopper consists of a plate 22, which forms the front wall of the hopper, and side plates 23, which form the side walls of the hopper. The upper ends of the plates 23 are provided with projections, which fit over the upper edge of plate 22 and are secured thereto by means of screws 24 passing through slots in the projections and screwing into the upper edge of the plate 22. By this construction the side walls of the hopper can be adjusted to accommodate different

sizes of blanks, and the necessity of providing a separate hopper for each size of blank is avoided. By mounting the side walls upon the front wall the hopper can be removed bodily from the machine. The hopper is held in position by means of vertical pins 25 on the machine-frame, between which and the bearings for the sleeves of the pressure-roller the ends of the plate 22 are received. Sidewise movement of the plate 22 is prevented by means of lugs 26 on the plate 22, which fit inside of the pins 25, as is clearly shown in Fig. 4. The plate 22 and the plates 23 carried thereby are free to move vertically toward and from the feed-table 21, the downward movement being limited by adjustable stop-screws 27 screwing through the lugs 26. The lower edge of the plate 22 is beveled, as shown in Fig. 3, and the stop-screws 27 are so adjusted that the plate 22 is lifted by the blank as it is fed thereunder and rests on the blank during its passage to the rollers. The front wall of the hopper prevents the passage of but a single blank from the hopper to the rollers and constitutes a yielding guard for the forward edges of the blanks in the hopper. If the weight of the hopper is not sufficient to give the desired pressure on the bottom blank as it is fed to the rollers, leaf-springs 28, bearing against the upper edge of the plate 22, may be provided, as shown in Figs. 3 and 4. For feeding the blank from the hopper to the rollers a feed-slide 29 is provided, which is arranged to reciprocate over the feed-table 21 and beneath the hopper. This feed-slide extends beyond the hopper at each side and is provided with a serrated forward edge to engage the rear edge of the lowermost blank in the hopper. These serrations prevent the blank from being displaced sidewise while being fed beneath the front wall of the hopper to the rollers and is adapted to feed blanks of different sizes, as will be apparent. By this construction of feed-slide the necessity of providing a separate feed-slide for each size of blank is avoided. The rear side of the hopper is open, whereby the blanks can be readily placed in the hopper and any blank adjusted if out of position. In order to prevent the blanks being displaced during the backward movement of the feed-slide, a guard-plate 30 is secured to the frame of the machine at the rear of the hopper and extends over the feed-slide in close proximity thereto. This guard-plate also serves as a table to support the blanks preparatory to their being placed in the hopper. In order to allow for the adjustment of the guard-plate for blanks of different widths, the plate is adjustably secured to the frame of the machine by means of screws 31 passing through slots in the plate. The feed-slide is reciprocated by means to be hereinafter described to feed the lowermost blank in the hopper beneath the front wall of the hopper into the bite of the feed-rolls, as shown in Fig. 6.

As a blank is pushed forward by the feed-slide its forward edge engages the lower beveled edge of the front wall of the hopper and lifts the wall in passing thereunder, the blanks above being held from forward movement by the guard formed by the front wall of the hopper. In its passage to the roller the blank is prevented from being displaced sidewise by the engagement of the serrations of the feed-slide with its rear edge and is prevented from upward displacement by the front wall of the hopper, which presses it against the feed-table. In order to cause the blank to be forced into the die-cavity of the die-roller and be firmly seated against the bottom of the die-cavity, the mechanism for actuating the feed-slide is arranged to impart thereto a speed greater than the peripheral speed of the die-roller, whereby after the blank has been fed into the bite of the rollers it is bent and forced against the bottom of the die, as shown in Fig. 6. The rear portion of the blank, or the portion back of the line of contact of the rollers, is thus given a greater speed than the peripheral speed of the rollers, and the result of this, in addition to bending the blank into the die-cavity, is to press the surface of the pressure-roller, which is preferably of yielding material, forward into a position to hold the blank down against the bottom of the die. The backward displacement of the surface of the pressure-roller, which would otherwise take place, is thus prevented, and the pressure-roll acts to securely hold the blank against the bottom of the die during the skiving operation. As will be evident from an inspection of Fig. 6, the bottom of the die recedes from the pressure-roller during the passage of the first half of the blank through the rollers and rises toward the pressure-roller during the passage of the last half of the blank through the rollers. The blank will therefore be forced against the bottom of the die by the pressure-roller during the passage of the last half of the blank through the rollers even if not acted on by the feed-slide. The mechanism for actuating the feed-slide is accordingly arranged to release the blank after it has passed half-way through the rollers, and the blank is fed the remaining distance by the action of the rollers alone. It is desirable that this feeding action be performed principally, if not entirely, by the die-roller, as thereby any liability of the blank being displaced is avoided. Moreover, the pressure-roller is thus relieved of all strain due to the feeding operation, and the life of the roller, especially when provided with a covering of yielding material, is appreciably prolonged. Also the surface of the roller is not displaced, as when it is used to perform the feeding operation, and the roller thus acts to more firmly hold the blank against the bottom of the die. In order to enable the die-roller to perform this feeding function, the bottom of the die-cavity is provided with indentations in

the form of grooves, as shown, which effectually prevent the blank from being displaced as it is forced against the skiving-knife.

In order to avoid the necessity of separate rolls for skiving blanks of different sizes or shapes or for skiving blanks of different thickness, I provide the die-roller with a plurality of die-cavities and provide means for relatively adjusting the die-roller and the mechanism for actuating the feed-slide to bring any die-cavity and the feed-slide into coöperative relation. As shown in the drawings, the die-roller is provided with two die-cavities arranged circumferentially of the die-roller, one of these cavities being of greater depth than the other, whereby one die-cavity can be used in skiving blanks of thick stock and the other cavity used in skiving blanks of thin stock. The means which I have shown in the drawings for relatively adjusting the die-roller and the actuating mechanism of the feed-slide consists in the means above described for removably supporting the die-roller. The ends the die-roller are provided with diametrically opposite slots. In placing the die-roller in the machine lugs 10 on the flange of the sleeve 6 and shaft 5 enter these slots, and thereby bring one of the die-cavities into proper position with relation to the actuating mechanism of the feed-slide to receive the blank fed forward by the slide. By removing the roller and turning it through a half-revolution the lugs 10 engage the diametrically opposite slots, and thereby bring the other die-cavity into position to receive the blank.

The feed-slide 29 is adjustably secured by means of screws 32, passing through slots in the slide to a reciprocating block 33, mounted in guideways in the machine-frame beneath the guard-plate 30. A screw 34, having a screw-threaded engagement with the block 33 and provided with a flange 35, passing through an opening in the feed-plate, serves as convenient means for adjusting the feed-slide on the block 33. The block 33 is reciprocated by means of a link 36, which connects the block with a yoke 37, secured to the rock-shaft 38, journaled in the frame of the machine, said rock-shaft being provided with an arm 39, which carries a roll engaging a cam-groove cut in the inner face of the gear 15.

In the construction shown in the drawings (see more particularly Fig. 3) the feeding mechanism is thrown out of operation during the operation of the machine by disconnecting the block 33 from the link 36. In order to allow the block to be disconnected from the link, the connection between these parts consists of a pin 40, extending between lugs projecting downwardly from the block 33 and an open-ended slot in the upper side of the link 36. The rear wall of this slot extends above the front wall, and the controller, to be hereinafter described, which controls the position of the link is arranged to allow the link to fall sufficiently to remove the front wall of the slot from engagement with the pin, but not the rear wall. By reason of this construction the block 33 is disconnected from the link 36 only when the feed-slide is in its forward position. The controller for determining the position of the link 36 consists of a roll 41, which forms a support over which the link 36 slides. The roll 41 is journaled between the arms of the yoke 42, loosely pivoted on the shaft 38, and connected, by means of a rod 43, to a foot-treadle 44 at the base of the standard 4. The treadle is normally held up against the adjustable stop 45 by means of coiled springs 46, secured to the treadle and to the standard 4, the treadle when in this position acting to lower the roll 41 and allow the link 36 to disengage the pin 40 when the feed-slide reaches its forward position and to move over the roll without actuating the block 33. By depressing the treadle 44 the roll 41 is raised, and the link 36 is brought into a position to engage the pin 40. By disconnecting the feed-slide from its actuating mechanism when in its forward position the feed-slide forms a support for the pile of blanks while being arranged in the hopper and insures the proper feeding of the bottom blank when the feed-slide is thrown into operation.

In order to prevent the shaving which is cut from the blank by the skiving-knife from passing backward over the top of the pressure-roller and becoming wedged between the pressure-roller and the hopper or being fed through the rollers, the front wall of the hopper is provided with a flange 47, which extends over the pressure-roll.

The operation of the machine above described has been explained in connection with the description of the construction, and further description thereof is deemed unnecessary.

It will be understood that the machine illustrated in the drawings and above specifically described embodies the several features of my invention in their preferred form only and that my invention is not limited thereto, but may be embodied in many different constructions without departing from the spirit thereof.

Having thus 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 pressure device, a die-roller provided with a plurality of die-cavities and mechanism for feeding a blank to the die-roller and pressure device, said die-roller being adjustable to bring any die-cavity into coöperative relation with the feeding mechanism, substantially as described.

2. A leather-skiving machine, having, in combination, a pressure device, a die-roller provided with a plurality of die-cavities and mechanism for feeding a blank to the die-roller and pressure device, the feeding mechanism

and die-roller being relatively adjustable to bring any die-cavity and the feeding mechanism into coöperative relation, substantially as described.

3. A leather-skiving machine, having, in combination, a pressure device, a die-roller provided with a plurality of die-cavities arranged circumferentially of the roller, and mechanism for feeding a blank to the die-roller and pressure device, said die-roller being adjustable to bring any die-cavity into coöperative relation with the feeding mechanism, substantially as described.

4. A leather-skiving machine, having, in combination, a feed-table, a hopper yieldingly mounted above the feed-table provided with a front wall to form a guard for the forward edges of the blanks in the hopper, and means for feeding a blank beneath the front wall of the hopper, substantially as described.

5. A leather-skiving machine, having, in combination, a die-roller, a pressure-roller, a feed-table, a hopper mounted above the feed-table provided with a front wall to form a guard for the forward edges of the blanks in the hopper and with a flange projecting from the front wall over the rollers, and means for feeding a blank beneath the front wall of the hopper to the rollers, substantially as described.

6. A leather-skiving machine, having, in combination, a pressure device, a die-roller provided with a die-cavity, and feeding mechanism constructed and arranged to feed a blank into the bite of the die-roller and pressure device and to bend the blank into the die-cavity, substantially as described.

7. A leather-skiving machine, having, in combination, a pressure device, a die-roller provided with a die-cavity, means for rotating the die-roller and feeding mechanism for feeding a blank into the bite of the die-roller and pressure device constructed and arranged to impart to the rear portion of the blank a speed greater than the peripheral speed of the die-roller, substantially as described.

8. A leather-skiving machine, having, in combination, a pressure device, a die-roller provided with a die-cavity, means for rotating the die-roller, a feed-slide for feeding a blank into the bite of the die-roller and pressure device and means for imparting to the feed-slide a speed greater than the peripheral speed of the die-roller, substantially as described.

9. A leather-skiving machine, having, in combination, a die-roller, a pressure device, a feed-slide movable toward and from the die-roller and pressure device, mechanism for actuating the feed-slide, and a treadle and suitable connections for disconnecting the feed-slide from its actuating mechanism during the operation of the machine, substantially as described.

10. A leather-skiving machine, having, in combination, a die-roller, a pressure device, a feed-slide movable toward and from the die-roller and pressure device, a driving-shaft and suitable connections for actuating the feed-slide, and a treadle and suitable connections for rendering the connections between the feed-slide and shaft inoperative during the operation of the machine, substantially as described.

11. A leather-skiving machine, having, in combination, a die-roller, a pressure device, a feed-slide movable toward and from the die-roller and pressure device, actuating mechanism therefor and means under the control of the operator acting to disconnect the feed-slide from its actuating mechanism when the feed-slide reaches a predetermined position, substantially as described.

12. A leather-skiving machine, having, in combination, a die-roller, a pressure device, a feed-slide movable toward and from the die-roller and pressure device, a driving-shaft and suitable connections for actuating the feed-slide, a controller for rendering said connections inoperative when the feed-slide reaches a predetermined position and a treadle and suitable connections for actuating the controller, substantially as described.

13. A leather-skiving machine, having, in combination, a die-roller, a pressure device, feeding mechanism, a controller acting to throw the feeding mechanism into and out of operation at a predetermined time during the operation of the machine, and means under the control of the operator for actuating the controller, substantially as described.

14. A leather-skiving machine, having, in combination, a die-roller, a pressure device, feeding mechanism and means under the control of the operator for throwing said feeding mechanism into and out of operation at a predetermined time during the operation of the machine, substantially as described.

15. A leather-skiving machine, having, in combination, a feed-table, a hopper mounted above the feed-table provided with a guard for the forward edges of the blanks in the hopper, a feed-slide provided with a serrated edge to engage the rear edge of a blank in the hopper, and means for actuating the slide to feed a blank beneath the guard of the hopper, substantially as described.

16. A leather-skiving machine, having, in combination, a feed-table, a hopper mounted above the feed-table provided with a front wall to form a guard for the forward edges of the blanks in the hopper and with adjustable side walls, a feed-slide provided with a serrated edge to engage the rear edge of a blank in the hopper, and means for actuating the slide to feed a blank beneath the front wall of the hopper, substantially as described.

17. A leather-skiving machine, having, in combination, a pressure device, a die-roller provided with a plurality of die-cavities ar-

ranged circumferentially of the roller, and mechanism for feeding a blank to the die-roller and pressure device, the feeding mechanism and die-roller being relatively adjustable to bring any die-cavity and the feeding mechanism into coöperative relation, 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.