Oct. 31, 1950 R. W. HALL 2,527,811

LEATHER SKIVING MACHINE OR SPLITTER

Original Filed July 19. 1947 4 Sheets-Sheet 1

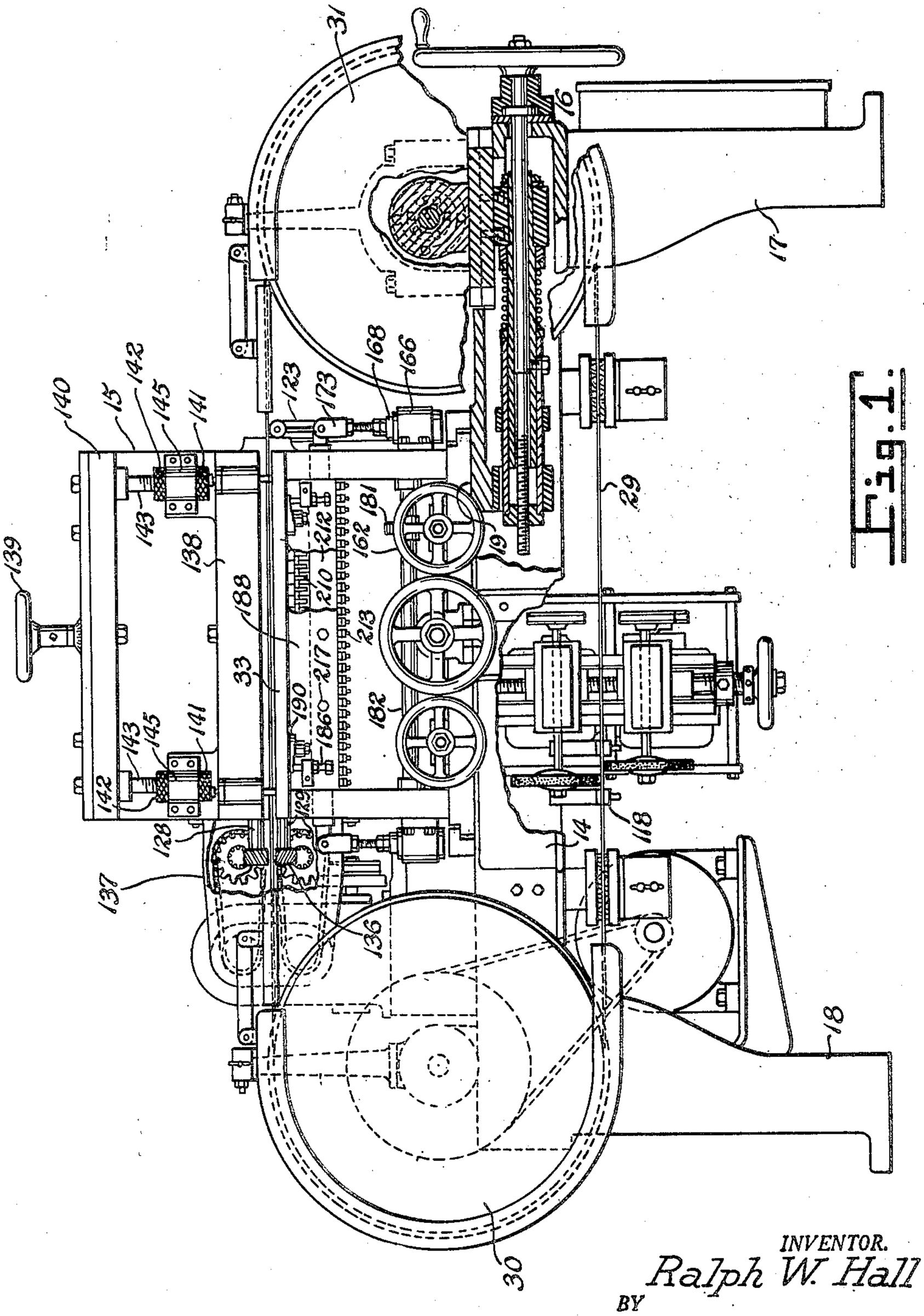

Fig. 1.

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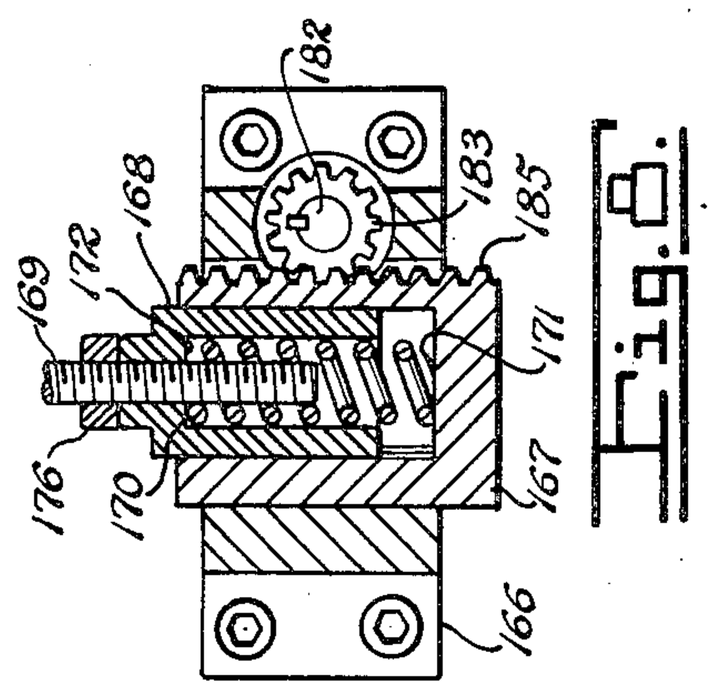

Fig. 6.

Fig. 2.

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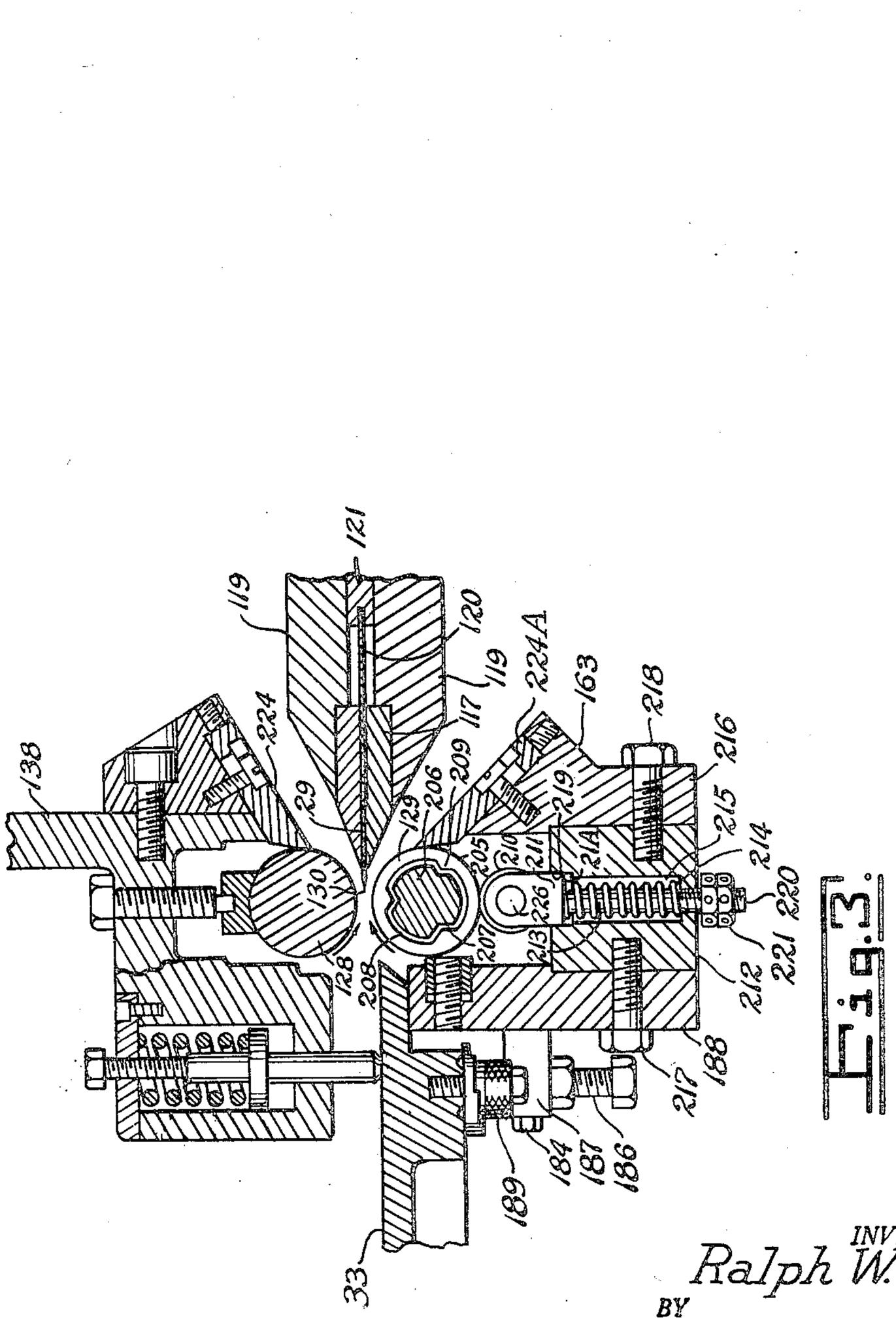

Fig. 3.

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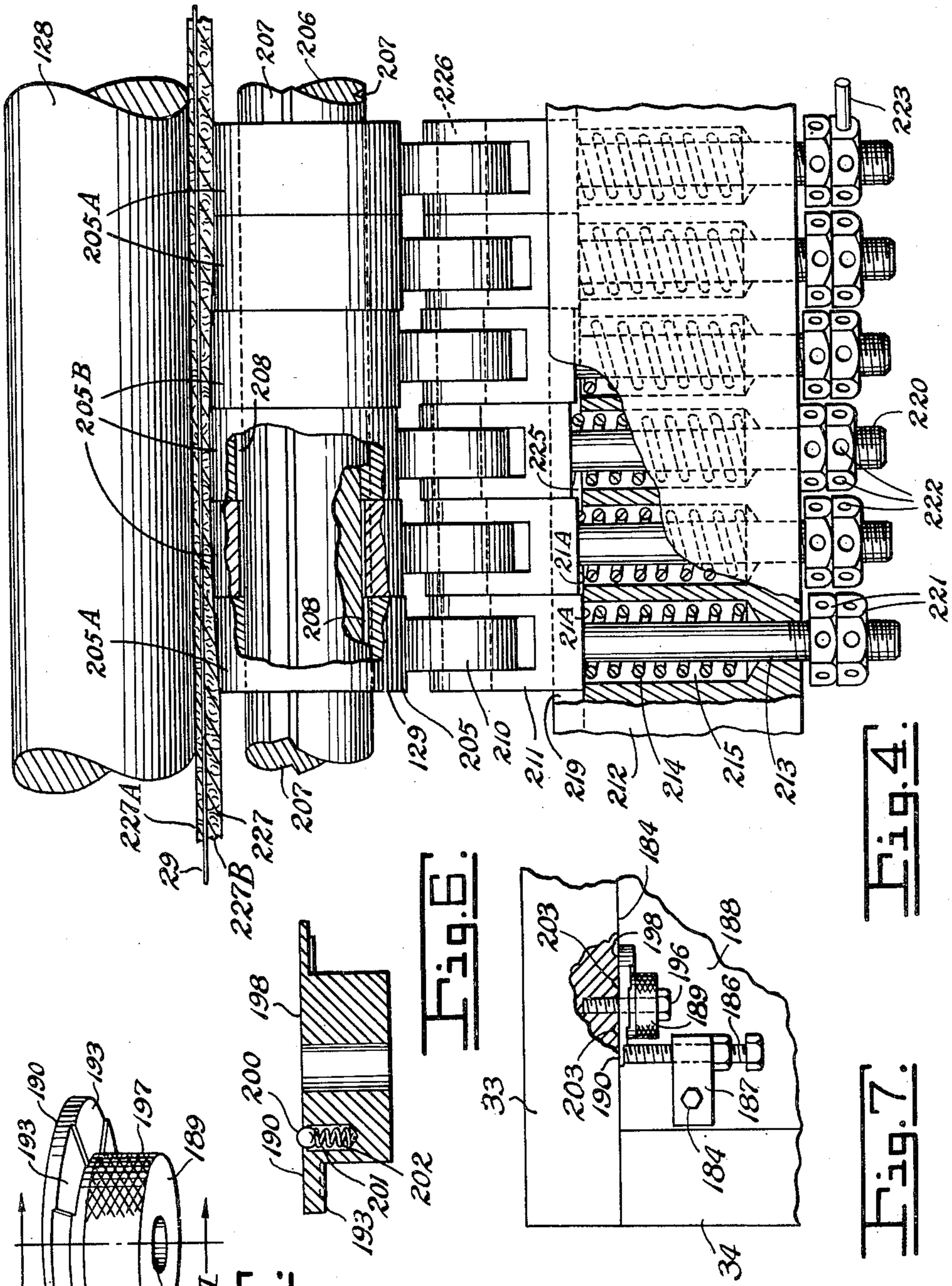

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE

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LEATHER SKIVING MACHINE OR SPLITTER

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Original application July 19, 1947, Serial No. 762,177. Divided and this application September 13, 1948, Serial No. 49,075

8 Claims. (Cl. 69—10)

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This invention relates to improvements in a leather skiving machine, splitter, or the like. This application is a division of my pending application Serial No. 762,177, filed July 19, 1947 which issued as Patent Number 2,524,013 on September 26, 1950.

An object of this invention is to provide means for adjusting and limiting the spacing between rolls of a leather splitting machine.

A further object of this invention is to provide adjustable stop members for limiting the spacing between rolls of a leather splitting machine to a selected distance.

A further object of this invention is to provide stop members each having a plurality of steps adapted adjustably to limit the spacing between rolls.

These and other objects and advantages are attained by the means described in the following specifications and illustrated upon the accompanying drawings, in which:

Fig. 1 is a front elevational view of the skiving machine embodying the improvements herein described, parts being broken away for clarity of illustration and description.

Fig. 2 is an enlarged fragmental perspective view of the swivel head, with parts broken away for clarity.

Fig. 3 is a transverse cross-sectional view of the roller assembly and knife support.

Fig. 4 is an enlarged fragmental view of the pressure roller assembly in elevation, with parts broken away for clarity of illustration.

Fig. 5 is an enlarged perspective view of a step flange collar used in spacing the pressure roller in relation to the skiving knife.

Fig. 6 is a cross-sectional view of the step flange collar taken on line VI—VI of Fig. 5.

Fig. 7 is a fragmental view, partly in cross section, showing the application of the step flange collar in relation to the pressure roller setting screw.

Fig. 8 is a vertical cross-sectional view of the pressure roll spring mounting means.

Machines for skiving leather and kindred materials are in general usage for producing thin sheets employed in the manufacture of bill folds, bags and cases of various types, shoe parts, and many other articles of commerce incorporating thin flexible sheet leather and similar materials. Such machines heretofore have given notoriously poor service in the performance of their intended functions, due to their relative inflexibility of operation, their inability to process with equal effectiveness all grades or weights of raw

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material, and various other limitations most of which result from the varied nature of the materials to be processed. The limitations which impair the usefulness and efficiency of such machines are well known in the trade, and many efforts have been advanced in the past with the purpose of overcoming some of the difficulties, but the market still has been seeking a satisfactorily operative and serviceable machine which is capable of advanced universal usage and productiveness. The machine of the present invention has proven itself greatly superior to others heretofore offered to industry, in its ability to process raw materials varying considerably as to weight, size, hardness, and uniformity of thickness, and in addition, provision has been made for maximum continuity of operation by reason of mechanical improvements, and the incorporation of means permitting a plurality of different skiving operations simultaneously. Various other advantages of merit in the improved machine will become manifest to those skilled in the art, as the description proceeds.

As exemplified in Fig. 1, the head, generally indicated by the character 15, is mounted on the bed 16, which in turn is supported by the legs 17 and 18. The head 15 rests directly upon the upper flat surface 19 of the forwardly extending central portion 14 of bed 16, being universally slidable thereon within defined limits.

An endless band knife 29 (Fig. 1) tracks upon a pair of horizontally aligned coplanar rotating drums 30 and 31, mounted at opposite ends of the bed 16. The knife, on its upper run, passes through openings 32 (Fig. 2) provided in the head uprights 34 substantially centrally thereof, then passes under the forwardly extending central portion 14 of the bed 16 on its lower run. The knife 29 performs a splitting or skiving action on leather or other material as said material is fed into the machine from the feeding table 33. The knife blade 29 always travels in a fixed path upon the drums 30 and 31 and through the head 15, regardless of the angularly swiveled position of the head 15 or the forward or rearward position of said head on the bearing surface 19.

The machine is provided with two sets of knife guides, one directly behind the feed rolls, as shown at 117 in Fig. 3, and the other at the grinding station, as indicated at 118 in Fig. 1. The knife guides 117 (Fig. 3) are mounted upon the knife guide supports 119, which in turn are supported between the head uprights 34 (Fig. 2) and held against displacement by means of the

screws 119A. In order to preclude displacement and distortion of the knife when leather or the like is being fed to the said knife, a backing blade 120 is provided, which is supported by the plate 121 mounted upon an adjustable back bar 122, shown in Fig. 2. The back bar is mounted on back bar supports 123 by means of adjusting screws 125. The knife guides 118 are mounted in suitable brackets depending from the bed 16 (Fig. 1).

A pair of vertically aligned parallel feed rolls 128 and 129 are horizontally mounted in the head 15 (Fig. 3) and rotated in opposite directions toward the beveled forward edge 130 of the knife 29, said rolls being driven by an appropriate motor, not shown.

The upper feed roll 128 is called the gauge roll because it controls the thickness of the split of leather. This roll, which may be solid, is journaled in bearings 137 (Fig. 2) mounted in the vertically adjustable gauge roll carriage 138 mounted upon the head, the up and down movement of which is controlled by the hand wheel 139 centrally disposed upon the sprocket housing 140 atop the head 15. Within the housing is a chain and sprocket mechanism for rotating in unison the screws 143 which elevate and lower the gauge roll carriage 138. Adjusting means for aligning the gauge roll in parallelism with the band knife 29 are indicated as adjusting collars 142 threaded upon the screws 143 and locked by the lock nuts 141 when the proper adjustment has been made by rotating the collars within the smoothly bored brackets 145 fixed to the carriage.

The gauge roll carriage 138 is also provided with pressure pin limit gauges (Fig. 3), one at each end of said carriage.

The lower feed roll 129 is called the pressure roll and is yieldably mounted on springs at opposite sides of the head 15, the amount of spring pressure being controlled by the hand wheel 162, Fig. 2. As shown in Fig. 1, the pressure roll 129 is driven by means of spiral gear 136, said roll being journaled in the pressure roll assembly, generally indicated by the symbol 163 (Figs. 2 and 3). The pressure roll assembly is slidably mounted in the vertical slideways 165 provided in the head uprights 34. A plunger guide 166, bored for slidably receiving the plunger housing 167, is secured to each outer face of the head uprights 34, as indicated in Fig. 2. The cylindrical plunger housing 167 is bored for receiving the plunger 168 (Fig. 3) which is tapped for threadedly engaging the lower end of the stud 169 and counterbored for receiving the compression spring 170. As will be noted in Fig. 3, the spring 170 is confined within the plunger 168 and the plunger housing 167 by abutment with bottom 171 of the plunger housing bore and the shoulder 172 of the plunger counterbore. The upper end of the stud 169 is in engagement with the clevis 173 (Fig. 2), which in turn supports the pressure roller assembly 163 by engaging the laterally extending arm 175 thereof. Means for locking any adjustments made upon the pressure roll spring mount may be provided, such as the lock nut 176 on the stud 169.

As hereinbefore stated, the spring pressure of the pressure roll 129 is controlled by the hand wheel 162, which is keyed to a shaft 177 suitably journaled in bearing blocks, one of which is shown at 178 in Fig. 3. Keyed to the shaft 177 is the worm 179 which meshes with the worm gear 181 keyed to a longitudinal shaft 182 journaled in and extending through the head uprights 34, a bearing being shown at 180. Keyed to each outer end of the longitudinal shaft 182 is a pinion 183 (Fig. 8), the teeth of which engage the rack teeth 185 provided on the outer diameter of the plunger housing 167.

Thus it will be seen that rotation of the hand wheel 162 will act to elevate and lower the pressure roll assembly 163 in the vertical slideways 165.

Means for limiting the upward travel of the pressure roll assembly may be provided, such as the adjusting screws 186, shown in Figs. 1 and 7. A block 187 is suitably fixed, as by means of the screw 184, to each end of the front plate 188 of the pressure roll assembly, said blocks being tapped for the reception of the adjusting screws 186. By means of these adjusting screws, the ends of which abut the under surface 184 of the feeding table 33, the lower pressure roll 129 is prevented from coming into contact with the knife 29 as the pressure roll assembly is elevated. The adjusting screws 186 may be set to receive the minimum thickness of leather fed to the feed rolls.

In order to eliminate guess work and the necessity of re-setting the adjusting screws 129 each time a different thickness of leather is fed to the knife, means for quickly and positively setting the pressure roller 129 may be provided. A step flange collar 189, shown in perspective in Fig. 5, is envisioned for accomplishing this object. The flange 190 of the collar is provided with a series of sector-like steps 193, as shown, the flange becoming progressively thicker with each sector, beginning with the thinnest sector 191 and ending with the heaviest sector 192. The step flange collar 189 is centrally apertured, as at 195, for rotatably mounting same upon the under surface 184 of the feeding table 33, the mounting means being a stud or screw 196, shown in Fig. 7. The collar diameter may be knurled, as at 197, to provide finger gripping means in rotating the collar, said collar being mounted with the upper face 198 thereof in abutment with the under surface 184 of the feeding table 33, in a position whereby the end face of the adjusting screw 186 will contact the substantial median radius of the flange steps 193. A blank or cut-out sector 199 may be provided between the steps or sectors 191 and 192 in order to permit the adjusting screw 186 to directly contact the under surface 184 of the feeding table when the pressure roll 129 is set for the minimum thickness of leather.

Thus it will be seen that it is an easy matter to adapt the pressure roll to various thicknesses of leather by the simple expedient of lowering the pressure roll assembly 163 by means of the hand wheel 162, manually rotating the step flange collars 189 until a predetermined step or sector thickness reaches a point above the adjusting screws 186, and then elevating the pressure roll assembly until the adjusting screws contact the step flange collar 189.

Means for positioning each step or sector substantially centrally of the adjusting screws 186 may be provided, such as the ball 200 peened into a pocket 201 of the collar 189, and backed by the spring 202, the ball being urged by the spring into one of a series of sockets 203 radially disposed upon the under surface of the feeding table 33 in alignment with the steps or sectors 193.

When the pressure roll assembly 163 has been elevated to the point where the adjusting screws

186 contact the feeding table under surface 184 or a step 193 of the flange collar, as the case may be, the hand wheel 162 is given approximately two full turns for the proper working compression of the springs 170 in the plunger housing 167. This compression, of course, may be varied to suit the individual requirements of various types and textures of leather.

In order to compensate for variations of thickness in a piece of leather being fed to the knife, novel compensating means have been provided, as illustrated in Figs. 3 and 4. It will be noted that the pressure roll 129 comprises a plurality of collars 205, each independently yieldable vertically, the collars being mounted upon a roll shaft 206, said shaft being provided with longitudinal grooves 207, which may be substantially V-shaped, as shown in Fig. 3. The inner diameter of the collars is substantially the same in configuration as the outer diameter of the roll shaft 206, but substantially larger in size, to permit vertical movement of the collars upon said shaft. The space between the collars and shaft is indicated at 208. The engagement of the inwardly projecting V-shaped lugs 209 in the collars 205 with the corresponding U-shaped grooves 207 on the roll shaft 206 assures rotation of said collars with rotation of said shaft.

The pressure roll collars 205 are independently urged upwardly by means of frictionally rotatable rollers 210 mounted in spring loaded clevises 211, said rollers being at all times in contact with the roll collars 205, as illustrated, the rollers 210 and the clevises 211 being equal in number to the pressure roll collars 205. As shown in Fig. 3, the clevises are mounted in a clevis block 212, bored to receive the clevis shanks 213 and counterbored as at 215 to receive the springs 214 in encircled relation with the clevis shanks 213

As illustrated in Fig. 3, the clevis block 212 is interposed between the pressure roll assembly front plate 188 and back plate 216, said plates being detachably secured to the clevis block by means of the screws 217—218. For purposes of clarity, the front plate 188 is omitted from Fig. 4. A longitudinal slot 219 is machined in the clevis block 212, in alignment with the bores 215, the slot providing a seat for the clevises 211 when downward pressure is exerted upon them. The springs 214 are confined in the bores 215 by the clevises 211. The lower end of each clevis shank 213 is threaded as at 220, and threaded thereon is a pair of perforated jam nuts 221. Means for turning the contiguous pairs of nuts 221 upon the threaded clevis shanks have been provided by the perforations 222 in said nuts, the nuts being rotated by a rod, such as 223, inserted in said perforations. As will be noted in Fig. 4, the jam nuts are adjusted to provide a clearance 225 between the clevis 211 and the clevis block 212 when the clevises are urged upwardly by the springs 214. The clearance 225 is substantially equal to the clearance 208 between the roll shaft 206 and the collars 205. Clevis pins, upon which the small rollers 210 are mounted, are indicated at 226. Adjustable scraper plates 224 and 224A, suitably fixed to the gauge roll carriage 138 and the pressure roll assembly 163, respectively, as shown in Fig. 3, may be provided.

Fig. 4 clearly delineates the function of the pressure roll 129 on a piece of leather 227 being fed to the knife 29. Normally the leather, as it is gripped between the rotating feed rolls, will force the pressure roll collars 205 down upon the roll shaft 206, as shown by the collars 205A. If

a thin section in the leather 227 is encountered by the pressure roll 129, the collars which are in contact with the thin portion will force the leather upward against the solid gauge roll 128 by the action of the springs 214, as indicated by the collars 205B in Fig. 4, thus assuring a split of leather of uniform thickness. It might be here stated that the upper or usable part of the skived leather is called the split, while the lower part is scrap or waste. In Fig. 4, the split and scrap are indicated by the symbols 227A and 227B, respectively.

From the foregoing, it will be understood that the arrangement of clevises disclosed herein relieves vital parts of the machine of undue and injurious strains that might otherwise spring the shaft, and particularly the roll shaft 206 which is made relatively light in order to keep the size of collars 205 within reasonable size limits. As previously stated, the collars all have a definite clearance for lateral displacement upon the shaft 206. This clearance is the same as the limit of reciprocation of the clevises. Thus, the lock nuts 221 are adjustable to preclude upward movement of the clevises beyond the free movement of the collars permitted by the collar clearance at the roll shaft 206, so that none of the force of springs 214 is available to arch the shaft upwardly intermediate its ends, when splitting thin leather or when the machine is running idle. Similarly, the shoulders 21A of all the clevises provide definite and substantial stops operative against the heavy rigid clevis block or bar 212, to limit the extent to which a thick or hardened workpiece might force the collars 205 downwardly, thereby avoiding depression of the collars beyond the downward limits established by the collar clearances at 225. Thus, there is no danger of collar shaft 206 being sprung or downwardly arched, by passing an unusually thick or hard workpiece through the machine.

In addition to the advantage of individually yieldingly mounted collars 205 forming the pressure roll 129, the entire pressure roll assembly 163 is yieldably mounted upon the spring loaded plungers 168, as hereinbefore recited and shown in Fig. 2. This pressure roll design assures efficient operation of the machine and a uniform quality of production.

The machine constructed as disclosed herein is highly productive and will perform many operations which heretofore had to be assigned to other machines especially adapted for splitting different grades and weights of leather. Repeated handling of the products is thereby avoided, and the machine therefore is kept in continuous operation with a resultant saving of labor and operating expense. Various other advantages have been set forth previously herein, and still others will be evident to those skilled in the art.

It is to be understood that various modifications and changes in the structural details of the machine may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. In a machine of the class described, a pressure roll, mounting means for said pressure roll including means for elevating and lowering said pressure roll, a feeding table including a lower face, means for limiting upward travel of said pressure roll, said limiting means comprising a block including a vertically disposed tapped hole, said block being fixed to the pressure roll mounting means, an adjusting screw threaded into said

block having one end extending upwardly therethrough and adapted to abut said feeding table lower face when said roll is elevated to its limit, means for selectively limiting the upward travel of the pressure roll to other predetermined limits, said selective limiting means comprising a step collar including a flange, said flange being provided with a plurality of sector-like portions progressively increasing in thickness, beginning with a sector of minimum thickness and ending with a sector of maximum thickness, a sector-like portion of the flange being completely removed between the minimum thickness and the maximum thickness thereof, said step collar being rotatively mounted upon the feeding table lower face contiguous to the point where the adjusting screw contacts the said lower face, said adjusting screw being adapted to selectively abut the various sector-like portions of said flange upon elevation of the pressure roll.

2. In a machine of the class described, a pressure roll, mounting means for said pressure roll including means for elevating and lowering said pressure roll, a feeding table including a lower face, means for limiting upward travel of said pressure roll, said limiting means comprising a block including a vertically disposed tapped hole, said block being fixed to the pressure roll mounting means, an adjusting screw threaded into said block having one end extending upwardly therethrough and adapted to abut said feeding table lower face when said roll is elevated to its limit, means for selectively limiting the upward travel of the pressure roll to other predetermined limits, said selective limiting means comprising a step collar including a flange, said flange being provided with a plurality of sector-like portions progressively increasing in thickness, beginning with a sector of minimum thickness and ending with a sector of maximum thickness, and means rotatably mounting the sector collar upon the lower face of the feeding table in position to dispose the sectors thereof selectively in intercepting relationship to the adjusting screw.

3. In a machine of the class described, the combination of a frame, a pressure roll, and a gauge roll, means on the frame rotationally supporting the gauge roll in substantial parallelism with the pressure roll, means for bodily shifting the pressure roll relative to the frame and toward and from the gauge roll, and means including a series of stepped abutments for predetermining a multiplicity of spacings between the gauge roll and the pressure roll.

4. In a machine of the class described, the combination of a frame, a pressure roll, and a gauge roll, means on the frame rotationally supporting the gauge roll in substantial parallelism with the pressure roll, means for bodily shifting the pressure roll relative to the frame and toward and from the gauge roll, and means selectively adjustable for predetermining a series of spacings between the rolls.

5. In a machine of the class described, the combination of a frame including a feed table, a pressure roll, a gauge roll, means on the frame rotationally supporting the gauge roll in substantial parallelism with the pressure roll, a slidable carriage including journals rotationally supporting the pressure roll, means for moving the carriage toward and from the gauge roll, resilient

cushion means intermediate the carriage and the carriage moving means, and adjustable stop means limiting movement of the carriage toward the gauge roll in advance of operation of said resilient cushion means, to urge the pressure roll toward the gauge roll.

6. In a machine of the class described, the combination of a frame including a feed table, a pressure roll, a gauge roll, means on the frame rotationally supporting the gauge roll in substantial parallelism with the pressure roll, a slidable carriage including journals rotationally supporting the pressure roll, means for shifting the carriage toward and from the gauge roll, a stop normally fixed for movement with the carriage and toward the feed table, a stop collar rotationally mounted upon the feed table, an extending flange on the stop collar located to be struck by the stop when the carriage is elevated, and steps on the flange selectively alignable with the stop as the stop collar is rotated to various positions, to establish different elevations of the carriage relative to the feed table.

7. In a machine of the class described, the combination of a frame including a feed table, a pressure roll, a gauge roll, means on the frame rotationally supporting the gauge roll in substantial parallelism with the pressure roll, a slidable carriage including journals rotationally supporting the pressure roll, means for shifting the carriage toward and from the gauge roll, a stop normally fixed for movement with the carriage and toward the feed table, a stop collar rotationally mounted upon the feed table, an extending flange on the stop collar located to be struck by the stop when the carriage is elevated, steps on the flange selectively alignable with the stop as the stop collar is rotated to various positions, to establish different elevations of the carriage relative to the feed table, and means for adjusting the normally fixed stop in the direction of travel of the carriage.

8. In a machine of the class described, the combination of a frame, a pressure roll, a gauge roll, means on the frame rotationally supporting the gauge roll in substantial parallelism with the pressure roll, a slidable carriage including bearing means rotationally supporting the pressure roll, means for yieldingly shifting the carriage toward and from the gauge roll, a stop and a rotary stop collar, one of which is mounted upon the shiftable carriage and the other upon the stationary frame, an extending flange on the stop collar located to be struck by the stop when the carriage is elevated, and steps on the flange selectively alignable with the stop as the stop collar is rotated to various positions, to establish different elevations of the carriage relative to the stationary frame.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,382,755	Baxter	June 28, 1921
2,082,057	Hood	June 1, 1937
2,423,500	Johnson	July 8, 1947