Oct. 10, 1939. B. J. PIERSON 2,175,570

MACHINE FOR STRETCHING AND SOFTENING LEATHER

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Fig. 1.

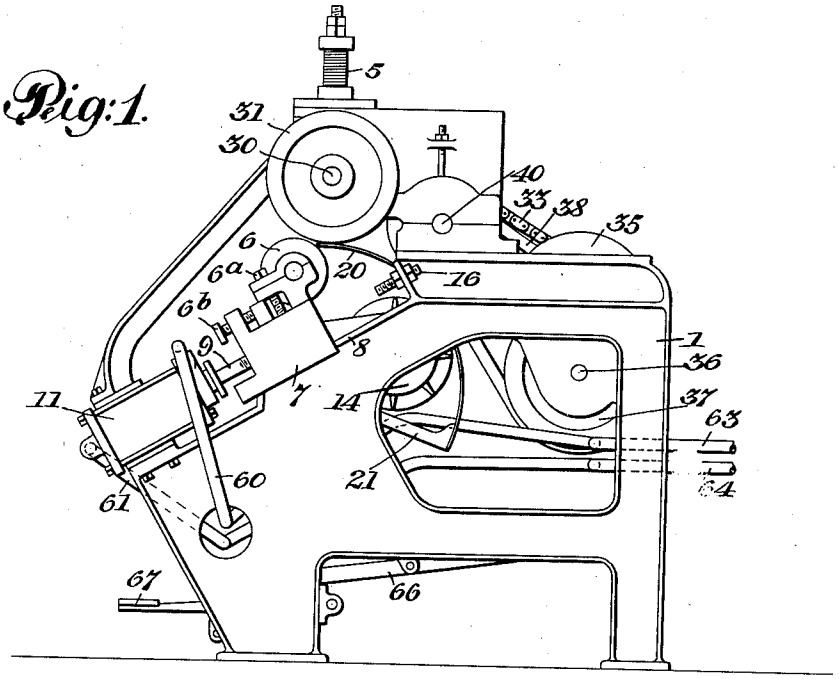
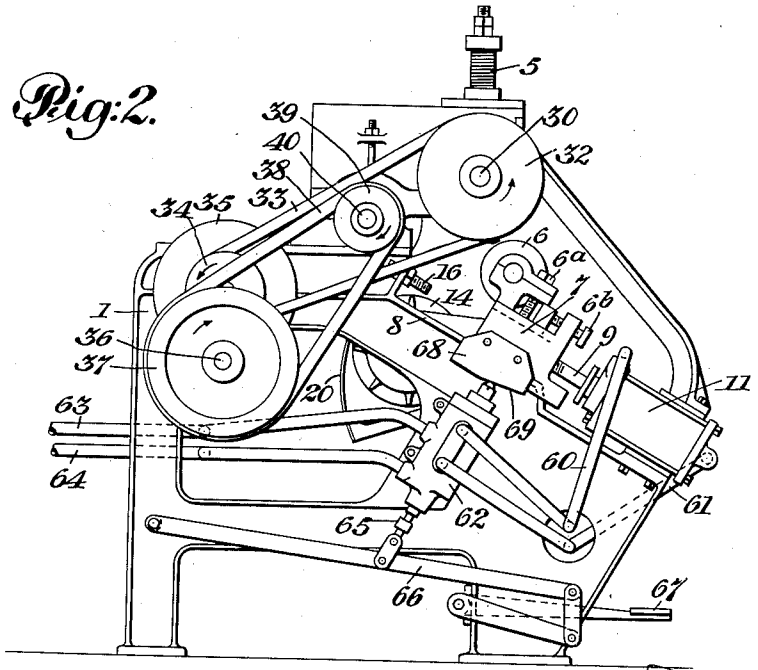


Fig. 2.



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Fig. 3.

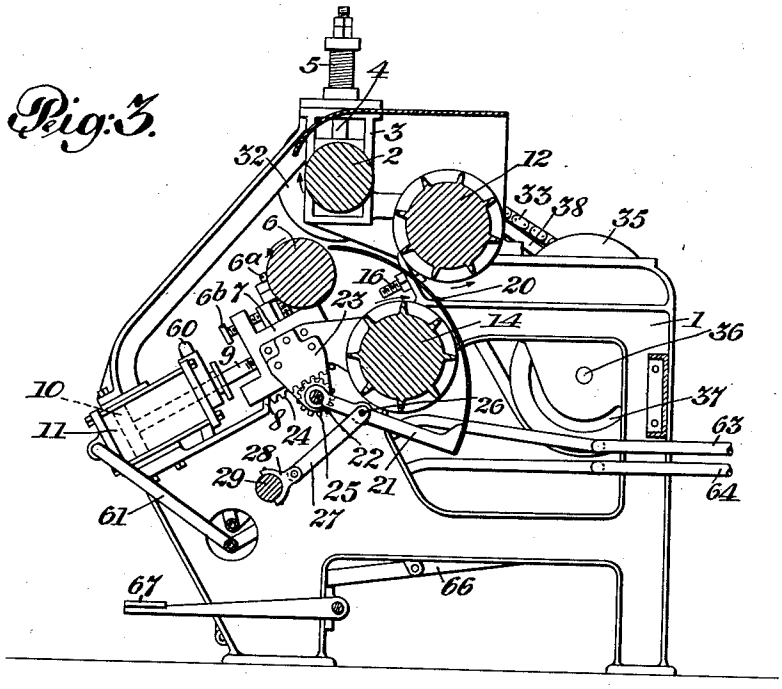
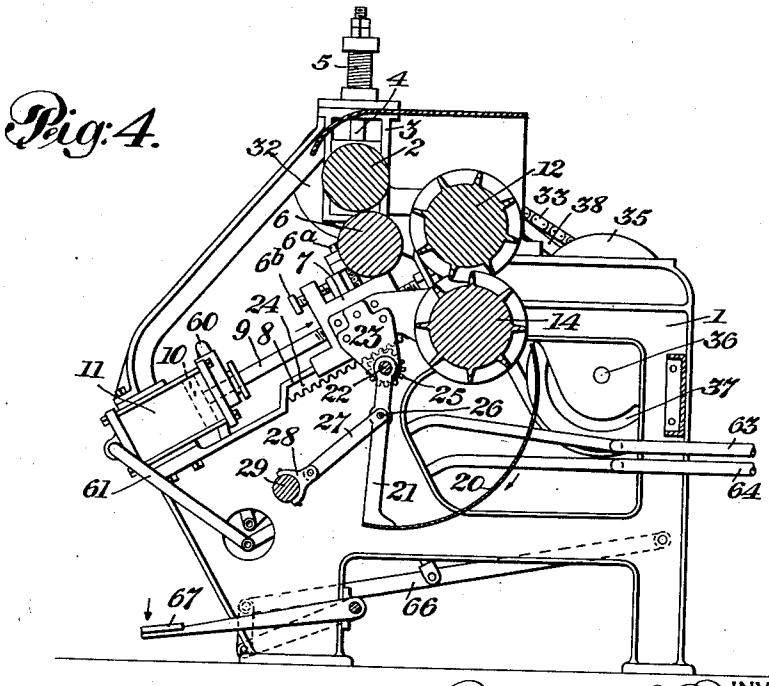


Fig. 4.



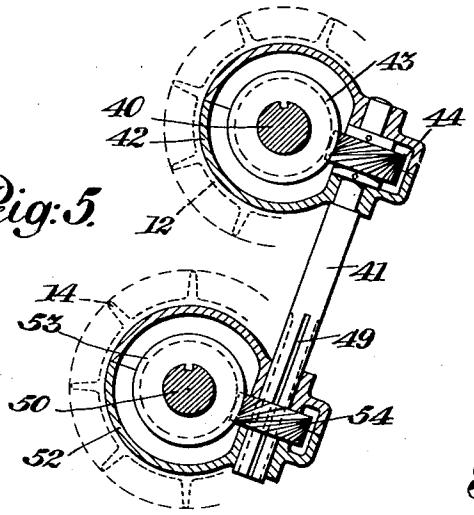
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MACHINE FOR STRETCHING AND SOFTENING LEATHER

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Fig:5.



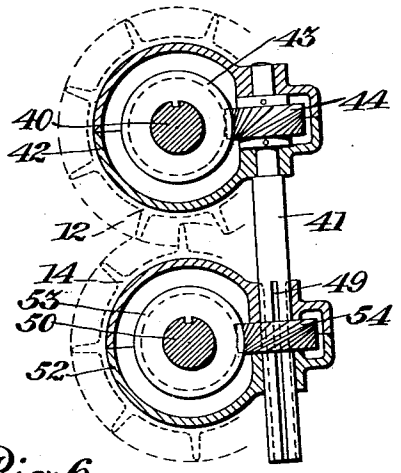


Fig:6.

Fig:7.

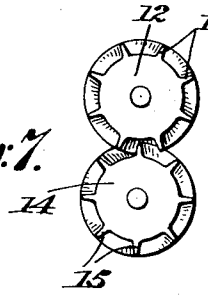


Fig:8.

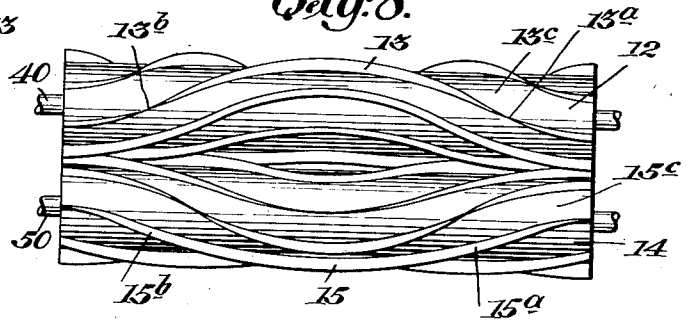


Fig:9.

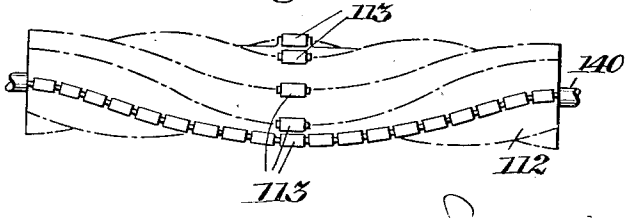
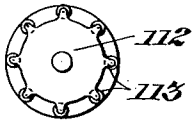


Fig:10.



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2,175,570

UNITED STATES PATENT OFFICE

2,175,570

MACHINE FOR STRETCHING AND SOFTENING LEATHER

Benjamin J. Pierson, Johnstown, N. Y., assignor to D. H. P. Manufacturing Co., Inc., Johnstown, N. Y., a corporation of New York

Application February 19, 1938, Serial No. 191,354

16 Claims. (Cl. 149—16)

My invention consists in the novel features hereinafter described, reference being had to the accompanying drawings which illustrate one embodiment of the invention selected by me for purposes of illustration, and the said invention is fully disclosed in the following description and claims. My invention consists in novel mechanism for stretching and softening leather.

A leading feature of my invention is the provision of stretching and softening rolls, each provided with radially projecting ribs continuous from one end of the roll to the other, in the form of reverse spirals extending from the center of the length of the roll where the central portion of each rib is substantially parallel to the axis of the roll, toward the ends where the ribs again come into substantial parallelism with said axis, the spiral ribs having a comparatively low pitch. The action of these ribs as hereinafter explained will be to effect a longitudinal stretching of the leather treated while the spiral portions between the central and end substantially longitudinal portions will effect a lateral stretching of the leather. These ribs extend outwardly from the cylindrical surface of the rolls a short distance, uniform from one end of the roll to the other, forming comparatively wide grooves between them which partake necessarily of the opposite spiral character of the ribs from the center toward the ends of the roll, said grooves being of much greater width than the ribs, and the ribs of each roll are so located that when the rolls are in operative relation, they extend to a greater or less extent into the wide grooves between the ribs of the other roll, and centrally between them, and means are provided for rotating said rolls in synchronism so as to preserve this relation between the ribs of the opposed rolls. Another feature of my invention is the provision of feed rolls for engaging the skin to be treated, and to feed it in a direction away from the stretching rolls, which are ordinarily rotated in a direction opposite that of the feed rolls, so as to cause the ribs of the stretching rolls to stretch the skin both lengthwise and transversely at the same time, by reason of their opposite spiral character, and rendering the skin more soft and pliable.

Another feature of my invention is the provision of means for moving one of the stretching rolls toward and from the other, and the provision of a movable table preferably of curved form which is automatically moved between the stretching rolls when the latter are separated, to support the skin to be treated, and which is automatically moved away from its position from said stretching rolls as they are brought together.

Another feature of my invention is the provision of means for regulating the extent to which the ribs of one stretching roll shall project into the grooves of the other, and thereby regulate the degree of stretching to which the skin is subjected.

Another feature of my invention is the provision of means for maintaining the proper relation between the ribs of the opposed stretching rolls at all times, whether said rolls are separated or within operative relation with each other.

These and other features of my invention will be more particularly described and pointed out in the following description and claims.

In the accompanying drawings,

Fig. 1 is an end elevation of a machine embodying my invention, and selected by me for purposes of illustration.

Fig. 2 is an opposite end elevation of the machine.

Fig. 3 is a vertical centrally sectional view of the machine, showing the feed rolls of the stretching rolls in separated relation, and the curved table in between the stretching rolls.

Fig. 4 is a similar view showing the feed rolls and stretching rolls in operative relation, and the swinging table removed from between the stretching rolls.

Fig. 5 is a detail view of connected and driving mechanism for the stretching rolls for maintaining them at all times in synchronized relation, the rolls being shown separated.

Fig. 6 is a similar view of the same parts with the stretching rolls in operative relation.

Fig. 7 is a sectional view drawn to a smaller scale, showing the stretching rolls in operative relation.

Fig. 8 is an elevation of the stretching rolls in the relation shown in Fig. 7.

Fig. 9 is a schematic view of a stretching roll, which embodies a modification of my invention.

Fig. 10 is a sectional view of the roll shown in Fig. 9.

Referring to the drawings, 1 represents the frame of the machine, which may be of any desired form. 2 represents the upper feed roll, which may be formed of rubber or any other suitable material, and is mounted in bearings movable vertically within guides 3, connected by rods 4, with a depressing spring 5, in the usual manner in leather working machines, so as to hold the upper feed roll 2, yieldingly in stationary relation to the frame, but permitted to rise. if necessary,

to avoid injury to the skin under treatment. 6 is the lower feed roll which is mounted in a sliding carriage indicated at 7, adapted to move on an inclined guide 8, provided on each side of the machine. This carriage is operatively connected with the piston rods 9, of pistons 10, carried in hydraulic cylinders 11, which pistons may be actuated hydraulically as hereinafter described, under the control of suitable valve mechanism, to move the carriage along the guides 8, and bring the feed rolls 6 and 2, into operative relation. In order to secure the synchronized movements of the carriages 7, under the actuation of the hydraulic cylinders 11, I provide a countershaft 22, extending across the machine, and mounted in brackets 23, secured to the carriages 7, and provided with suitable bearings to the shaft 22. Each of the inclined carriage guides 8, is provided with a stationary rack 24, which racks are engaged by pinions 25, rigidly secured to the countershaft 22. With this construction it will be obvious that when power is applied to the hydraulic cylinders 11, the carriages 7, with the lower feed roll 6, and lower stretching roll 14, will move upwardly into operative position with a uniform movement, and with the axes of said rolls at all times in parallelism with the axes of the upper feed roll 2, and the upper stretching roll 12. The upper stretching roll, which as best shown in Fig. 8, is provided with a plurality of ribs 13, extending in the form of opposite spirals of low pitch indicated at 13*a* and 13*b*, from the center of the length of the roll toward the opposite ends. The central portion of each rib is almost straight, and extends longitudinally with respect to the roll and substantially parallel with the axis of the roll. The spiral portions between this central portion and the portions at each end of the roll are preferably of such a low pitch that the end portions also of each rib are substantially parallel with the axis of the roll. The roll 12, is mounted in stationary bearings in the frame 1, in any suitable manner. 14 represents the lower stretching roll which is mounted on the carriage 7, and is provided with corresponding ribs 15, having the opposite spiral portions 15*a*, 15*b*. The ribs 15, at their central portions are substantially parallel with the axis of the roll 14, and the end portions likewise are disposed parallel with the axis of the roll so as to cooperate with the corresponding portions of the roll 12, to exert a longitudinal stretching action on the leather, while the opposite spiral portions 15*a* and 15*b*, between the central and end portions of the rib have the effect of stretching the leather transversely, as will be readily understood. The ribs of each stretching roll extend into wide recesses indicated at 13*c* between the ribs, of the opposed roll when the rolls are rotated in operative relation, and centrally thereof as clearly indicated in Fig. 7. 16 represents adjustable stops on the machine frame located in the path of the carriages 7, and adapted to arrest them when the ribs of the opposed stretching rolls are in proper operative relation with each other, and as the carriages also conveniently carry the movable pressure roll 6, the bearings supporting said pressure roll may be adjusted with respect to the carriages by means of set screws indicated at 6*a* and 6*b*, in a well-known way, so that if the stops 16, are adjusted to vary the degree to which the ribs of the opposed stretching rolls extend into the recesses of the opposed roll, the bearings of the lower feed roll 6, may be correspondingly adjusted so as to provide the desired pressure between it and the upper feed roll 2.

20 represents a curved table, preferably in the form of a segment of a cylinder, supported at the outer ends of arms 21, pivotally supported on the shaft 22, connecting the carriages 7, but freely movable with respect to said shaft. Each of said arms 21, at the opposite ends of the table 20, are provided with bearings for a transverse pivot shaft 26, which is connected at each end by links 27, with a stationary part of the machine, in this instance, each of the links 27, being pivotally connected to a bracket 28, at a stationary cross bar 29, forming part of the main frame.

When the carriages 7, are in their retracted positions, the curved table 20, will have its upper end closely adjacent to the lower feed roll 6, and will extend downwardly above the lower stretching roll 14, so as to support the skin or piece of leather to be treated, and keep it out of contact with the stretching roll 14, as shown in Fig. 3. It will be obvious that when the hydraulic cylinders are actuated and the carriages 7, move upwardly, the action of the arms 21, with the shaft 22, will cause these arms to be rocked on the pivot shaft 26, and thereby swing the table 20, downwardly and rearwardly into the position indicated in Fig. 4, to permit the stretching rolls to engage opposite faces of the skin or piece of leather. The links 27, permit the slight movements of the pivot shaft 26, vertically to accommodate this movement.

The arrows in Figs. 3 and 4 indicate the direction of rotation of the feed rolls 2 and 6, and the stretching rolls 12 and 14. Any suitable driving mechanism may be employed. In this instance, the main driving shaft is indicated at 30, which in this instance is provided with a driving pulley 31, to which power may be applied from a motor, line shaft, or other suitable source of power. The shaft 30, is shown provided with a sprocket indicated at 32, at the opposite end of the machine, connected by a sprocket chain 33, with a sprocket 34, on a shaft extending into a change gear box 35, of any suitable character, for determining the speed of the rotated parts. A shaft 36, extends from the gear box, and is provided with a pulley 37, connected by a belt 38, with a pulley 39, on a shaft 40, which supports the upper stretching roll 12.

It is obvious that the stretching rolls 12 and 14, must be driven in synchronism in order to maintain the proper relation between their respective ribs and recesses. This is accomplished in the present instance by means of a movable vertically disposed shaft indicated at 41, having its upper end mounted in a bearing secured to a gear casing 42, surrounding a spiral gear 43, and supported on the shaft 40, and capable of oscillating with respect thereto and enclosing intermeshing spiral gears 43 and 44. The spiral gear 43, meshes with a spiral pinion 44, on the shaft 41, and imparts rotary motion thereto. The lower stretching roll 14, is provided with a supporting shaft 50, which is provided with a spiral gear 53, within a gear casing 52, supported on the shaft 50, and capable of oscillating movement with respect thereto. This gear casing is provided with a bearing for the lower end of the shaft 41, which is provided with a long keyway 49, to engage a spiral pinion provided with a key, so that it may slide on the shaft 41. This construction is clearly illustrated in Figs. 5 and 6, and it will be readily understood that it accommodated the movement of the lower stretching roll 14, toward

and from the stationary upper stretching roll 12, indicated in dotted lines in Fig. 5, and also in Fig. 6, while causing them at all times to rotate synchronously, regardless of the movement of the lower roll 14, into and out of operative position.

I prefer to make the hydraulic pistons in the cylinders 11, double acting, and I have shown each end of each cylinder provided with pipes, said pipes being indicated at 60, and 61, forming part of a hydraulic system, and operatively connected with a control valve indicated at 62. This hydraulic system is substantially identical with that shown in my former Letters Patent of the United States No. 2,054,443, granted September 15, 1936, and forms no part of my present invention. It will therefore not be described or illustrated herein, except insofar as is necessary for an understanding of the operation of my present invention.

The hydraulic fluid will be supplied under pressure to the valve mechanism 62, through the pipes 63 and 64, preferably from a pump, provided with a well-known means for maintaining a predetermined pressure, which can be regulated as desired. The valve mechanism will admit pressure fluid in rear or in front of the pistons, as required to move the lower feed roll and lower stretching roll into and out of operative position, as required. The lower ends of the valve stem indicated at 65, are connected with a lever 66, operated by a pedal 67, in such manner that the downward movement of the pedal actuates the valve so as to cause the pistons to move the carriages 7, and the rolls carried thereby into operative position, the release of the pedal permitting the pedal to be returned to raised position under the action of a spring (not shown), within the valve casing, thereby reversing the operation of the hydraulic cylinders, and returning the carriages and their respective rolls to open or inoperative position. The valve stem extends above the valve casing and adjacent the carriage 7, which is provided with a cam block 68, having an inclined cam grade 69, which engages the valve stem as the parts are returned to inoperative positions, and depress the valve so as to throttle the movement of hydraulic liquid therethrough, and enable the pistons and the carriages to come to rest in the inoperative position without shock or jar. It will be understood however, that the lower pressure roll and the lower stretching roll may be moved into and out of operative position by other than hydraulic means under the control of a suitable pedal, or hand lever, in any well known way, without departing from the spirit of my invention.

Assuming that the parts are in inoperative or open position as indicated in Figs. 1 and 3, the operator will spread a skin or piece of leather to be treated upon the curved table 20 which is then in the position shown in Fig. 3, between the stretching rolls, with its forward edge in position to be grasped between the lower pressure roll, which is not driven, and the upper roll. Assuming that the upper feed roll and the upper and lower stretching rolls are being operated at the desired speed, as previously described, the operator will depress the pedal, or otherwise move the carriages 7, upwardly along their inclined guides, bringing the feed rolls 6 and 2, into operative relation and simultaneously bringing the stretching rolls 12 and 14 into operative intermeshed relation, the operator meanwhile holding the edge of the leather or skin nearest him. There is no danger of the operator having his fingers caught in the pressure rolls, however, as the upper pressure roll is rotating continuously in a direction toward the operator, and the upper face of the lower pressure roll immediately begins to move toward the operator as soon as the skin is clamped between the rolls. As the pressure rolls come together, the curved table is moved out of its position between the raised rolls, as clearly indicated in Fig. 4, and the stretching rolls come together, both being rotated in such a manner as to cause their respective ribs to move in directions away from the pressure rolls. As a result, the pressure rolls each of which rotates in one direction only draw the skin or leather between the stretching rolls, the ribs of which bend the leather between the ribs of the opposed roll to a greater or less extent, according to the adjustment of the roll, and as they are moving in a direction away from the pressure rolls, these curved and oppositely spiraled ribs exert friction upon the opposite faces of the skin or leather, tending to stretch it in a direction away from the pressure rolls, and also laterally, by reason of the opposite spiral portions of said ribs. It will be seen that the portions of the rib which are nearly straight or, in other words, substantially parallel to the axis of the roll in the central portion of the ribs and also adjacent to their ends, will exert a very direct pull longitudinally of the skin against the grip of the pressure rolls which are drawing the leather through the stretching rolls, and this in conjunction with the spiral portions between the central and end portions effect the uniform stretching of the leather longitudinally, while the said spiral portions at the same time effect a transverse or lateral stretch of the leather in opposite directions. The stretching of the leather is also facilitated by the fact that the spiral ribs of one roll mesh centrally into the spaces or grooves between the spiral ribs of the opposed rolls, as they rotate in opposite directions. After passing the skin or leather through the stretching rolls in one direction, the pedal will be released, and the machine opened, thereby restoring the table 20, to its feeding position, and the skin or leather will be reversed and the machine operated to stretch the material further, and stretch the portion thereof between the stretching rolls and the operator's hands, which did not pass between the stretching rolls on the first passage therethrough. The pressure rolls and stretching rolls will preferably be made of sufficient length so that the skin or piece of leather can then be turned sideways and passed through the machine, and may thus be treated by the machine in various directions with respect to the longitudinal grain of the leather, until the desired stretching of the skin or leather is accomplished. It will be understood that the effect of the curved and oppositely spiral ribs of the stretching rolls will make for such a continuous bending of the leather in opposite directions as to soften the skin or leather and render it more pliable, at the same time increasing its area and also diminishing to a certain extent, its thickness. As a matter of fact, the area of a skin can be increased a considerable number of times its original area by treating it in the manner described. In order not to injure the surface of the leather or skin, the outer edges of the ribs will be rounded and rendered very smooth by polishing or otherwise, so that no scratches or other injurious effects will be produced on either surface.

In some instances, I have found it desirable, especially where a considerable amount of pres-

sure is to be exerted on the skin or leather between the stretching rolls, to form the ribs of longitudinally disposed and practically continuous rollers, instead of stationary ribs as previously described. I have illustrated in Figs. 9 and 10 such a stretching roller which may be used for either the upper or lower stretching roll, that is to say, in combination with rolls such as are illustrated at 12 and 14 in Figure 8, or if desired, both the upper and lower stretching rolls can be formed with the roller ribs, if this is found desirable. In Figs. 9 and 10, I have shown a roll indicated at 112, for example, provided with ribs formed by rollers 113, and extending in reverse spirals from the center of the roll, longitudinally towards its ends in exactly the same manner as illustrated in Fig. 8, the only difference being that the outer surfaces of the ribs are formed of rollers placed end to end, so that they will stretch the skin or leather practically by pressure dependent only upon the distance which the ribs of one roll extend within the recesses between the ribs of the opposed roll when in operative relation, and without any material friction upon the surface or surfaces of the skin or leather. This type of roll may be found particularly desirable with very tender skins and they may also be found desirable for skins which are stiff and require a high degree of pressure from the stretching rolls in order to bend and soften and stretch them, and as before indicated, a stretching roll provided with these continuous roller section ribs may be used on one face only of the skin, as the hair or finished side, or they may, if preferred, be used engaging both faces of the skin or leather.

It will be understood that the outer surfaces of the ribs of the stretching rolls, whether formed in the manner indicated in Figs. 1 to 8, or as shown in Figs. 9 and 10, will extend throughout their length at a uniform distance from the axes of the rolls.

What I claim and desire to secure by Letters Patent is:

1. A machine for stretching and softening leather comprising a pair of opposed stretching rolls, each provided with longitudinal parallel ribs having portions adjacent to the center of their length disposed substantially parallel to the axis of the roll, and reverse spiral portions, extending from said central portions respectively toward the opposite ends of the roll, said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, and said rolls being maintained at all times in predetermined relation to each other to bring the ribs of each roll substantially centrally into the space between two ribs of the opposed roll, at their adjacent surfaces when the rolls are rotated in operative relation, and means for rotating said rolls in synchronism in opposite directions.

2. A machine for stretching and softening leather comprising a pair of opposed stretching rolls, each provided with longitudinal parallel ribs having portions adjacent to the center of their length disposed substantially parallel to the axis of the roll, and reverse spiral portions, extending from said central portions respectively toward the opposite ends of the roll, said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, and said rolls being maintained at all times in predetermined relation to each other to bring the ribs of each roll substantially centrally into the space between two ribs of the opposed roll, at their adjacent surfaces when the rolls are rotated in operative relation, and means for rotating said rolls in synchronism in opposite directions.

3. A machine for stretching and softening leather comprising a pair of opposed stretching rolls, each provided with longitudinal parallel ribs having portions adjacent to the center of their length disposed substantially parallel to the axis of the roll, and reverse spiral portions, extending from said central portions respectively toward the opposite ends of the roll, said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, and said rolls being maintained at all times in predetermined relation to each other to bring the ribs of each roll substantially centrally into the space between two ribs of the opposed roll, at their adjacent surfaces when the rolls are rotated in operative relation, and means for rotating said rolls in synchronism in opposite directions, said rolls being separable to permit the leather to be placed between them, and a pair of feeding rolls rotatable in one direction only for engaging the leather and drawing it between said stretching rolls in a direction opposite to that in which the stretching rolls tend to draw the leather by the rotation thereof.

4. A machine for stretching and softening leather comprising a pair of opposed stretching rolls, each provided with longitudinal parallel ribs having portions adjacent to the center of their length, disposed substantially parallel to the axis of the roll and reverse spiral portions extending from said central portions respectively toward the opposite ends of the roll, the end portions of said ribs being also substantially parallel to the axis of the roll, and said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, means for rotating said rolls, and holding them at all times in predetermined relation to each other to bring the ribs of each roll substantially centrally into the spaces between two ribs of the opposed roll, at their adjacent surfaces when the rolls are rotated in operative relation.

5. A machine for stretching and softening leather comprising a pair of opposed stretching rolls, each provided with longitudinal parallel ribs having portions adjacent to the center of their length, disposed substantially parallel to the axis of the roll and reverse spiral portions extending from said central portions respectively toward the opposite ends of the roll, the end portions of said ribs being also substantially parallel to the axis of the roll, and said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, means for rotating said rolls, and holding them at all times in predetermined relation to each other to bring the ribs of each roll substantially centrally into the spaces between two ribs of the opposed roll, at their adjacent surfaces when the rolls are rotated in operative relation, said rolls being separable to permit the leather to be placed between them, and feeding rolls rotatable in one direction only for engaging the leather and drawing it between the stretching rolls in a direction opposite to that in which it tends to be drawn by the rotation of the stretching rolls.

6. A machine for stretching and softening leather comprising a pair of opposed stretching rolls, each provided with longitudinal parallel ribs having portions adjacent to the center of their length, disposed substantially parallel to the axis of the roll and reverse spiral portions extending from said central portions respectively toward the

opposite ends of the roll, the end portions of said ribs being also substantially parallel to the axis of the roll, and said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, means for rotating said rolls, and holding them at all times in predetermined relation to each other to bring the ribs of each roll substantially centrally into the spaces between two ribs of the opposed roll, at their adjacent surfaces when the rolls are rotated in operative relation, a pair of feeding rolls, one of which is movable into and out of operative relation with the other, means for rotating said feed rolls when in operative relation, in one direction only to draw the leather in a direction away from the stretching rolls and opposite to the direction in which the stretching rolls operate on the leather, and means for moving the feed rolls and stretching rolls simultaneously into and out of operative relation.

7. A machine for stretching and softening leather, comprising a pair of opposed stretching rolls, each provided with a plurality of spaced continuous parallel ribs having reverse spiral portions merging at a point substantially central with respect to the length of said rolls, the ribs of each roll being aligned substantially centrally with respect to a pair of adjacent ribs of the opposed rolls and extending into the space between said adjacent ribs when in operative position, one of said rolls being movable into and out of operative relation with the other, means for rotating said rolls synchronously in opposite directions, a pair of feed rolls, one of which is movable into and out of operative relation with the other, means for operating said feed rolls when in operative relation to draw the leather in a direction away from the stretching rolls, and opposite to the direction in which the stretching rolls operate on the leather, a movable table adapted to extend between the stretching rolls and adjacent to the movable feed roll when said rolls are in inoperative position, and means for moving said movable feed roll and stretching roll into operative position and simultaneously withdrawing said table.

8. A machine for stretching and softening leather, comprising a pair of opposed stretching rolls, each provided with a plurality of spaced continuous parallel ribs having reverse spiral portions merging at a point substantially central with respect to the length of said rolls, the ribs of each roll being aligned substantially centrally with respect to a pair of adjacent ribs of the opposed rolls and extending into the space between said adjacent ribs when in operative position, one of said rolls being movable into and out of operative relation with the other, means for rotating said rolls synchronously in opposite directions, a pair of feed rolls, one of which is movable into and out of operative relation with the other, means for operating said feed rolls when in operative relation to draw the leather in a direction away from the stretching rolls, and opposite to the direction in which the stretching rolls operate on the leather, a pivotally supported curved table adapted to extend between the stretching rolls and adjacent to the movable feed roll when said rolls are in inoperative position, and means operatively connected with said table for moving the movable feed roll and stretching roll into operative position and simultaneously withdrawing said table.

9. A machine for stretching and softening leather, comprising a pair of opposed stretching rolls, each provided with a plurality of spaced continuous parallel ribs having reverse spiral portions merging at a point substantially centrally with respect to the length of said rolls, the ribs of one roll extending between a pair of adjacent ribs of the opposed roll when in operative position, one of said rolls being movable into and out of operative relation with the other, means for rotating said stretching rolls synchronously in opposite directions, leather gripping and feeding means for feeding the leather between the stretching rolls in a direction opposite to that in which it is acted upon by the ribs of the stretching roll, a pivotally mounted curved table adapted to extend between said stretching rolls and adjacent to said feeding means when the stretching rolls are in inoperative relation, said feeding means comprising separable members, and means for moving said feeding means and the movable stretching roll into operative position, operatively connected with said table for simultaneously swinging it out of operative position.

10. A machine for stretching and softening leather, comprising a pair of opposed stretching rolls, each provided with a plurality of spaced continuous parallel ribs having reverse spiral portions merging at a point substantially centrally with respect to the length of said rolls, the ribs of one roll extending between a pair of adjacent ribs of the opposed roll when in operative position, one of said rolls being movable into and out of operative relation with the other, means for rotating said stretching rolls synchronously in opposite directions, a carriage comprising lateral slides supporting said movable stretching roll, guides supporting said slides and provided with racks, a shaft connecting said slides and provided with pinions engaging said racks, a stationarily mounted feed roll, and means for driving it in a direction opposite to that of the adjacent stretching roll, a feed roll supported by said slides, a curved table extending between the stretching rolls when in inoperative relation, pivoted arms supporting said table and operatively connected with said slides, hydraulic cylinders provided with pistons operatively connected with said slides, controlling valve mechanism for said pistons, and a pedal for operating said valve mechanism.

11. A machine for stretching and softening leather, comprising a pair of opposed stretching rolls, each provided with a plurality of spaced continuous parallel ribs having reverse spiral portions merging at a point substantially centrally with respect to the length of said rolls, the ribs of one roll extending between a pair of adjacent ribs of the opposed roll when in operative position, one of said rolls being movable into and out of operative relation with the other, means for rotating said stretching rolls synchronously in opposite directions, a carriage comprising lateral slides supporting said movable stretching roll, guides supporting said slides and provided with racks, a shaft connecting said slides and provided with pinions engaging said racks, a stationarily mounted feed roll, and means for driving it in a direction opposite to that of the adjacent stretching roll, a feed roll supported by said slides, a curved table extending between the stretching rolls when in inoperative relation, pivoted arms supporting said table and operatively connected with said slides, hydraulic cylinders provided with pistons operatively connected with said slides, controlling valve mechanism for said pistons, and a pedal for operating said valve mechanism, and adjustable stops for limiting the movement of said slides in a direction to bring the stretching rolls into opera-

tive relation, and means for adjusting the movable feed roll with respect to said slides to compensate for the adjustment of said stops.

12. A machine for stretching and softening leather, comprising a pair of opposed stretching rolls, each provided with a plurality of spaced continuous parallel ribs having reverse spiral portions merging at a point substantially centrally with respect to the length of said rolls, the ribs of one roll extending between a pair of adjacent ribs of the opposed roll when in operative position, one of said rolls being movable into and out of operative relation with the other, means for rotating said stretching rolls synchronously in opposite directions, a carriage comprising lateral slides supporting said movable stretching roll, guides supporting said slides, a stationarily mounted feeding roll, means for driving the same, a movable feed roll supported by said carriage slides, a curved table extending over the movable stretching roll when in inoperative position, supporting arms attached to said table having their opposite ends pivotally connected with said carriage slides, links pivotally connected to a stationary part of the frame and pivotally connected to said arms intermediate their ends, and means operatively connected with said slides for bringing said feed rolls and stretching rolls into operative relation and simultaneously withdrawing the table from between said stretching rolls.

13. A machine for stretching and softening leather provided with a pair of opposed stretching rolls which are each provided with longitudinally extending parallel non-cutting ribs, each of said ribs having central portions for stretching the leather longitudinally and disposed substantially parallel with the axis of the roll, and lateral spiral portions for also effecting the stretching of the leather laterally extending from the said central portion toward the opposite ends of the roll, said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, and the ribs of each roll projecting centrally between the adjacent ribs of the opposed roll when said rolls are in operative relation, and means for driving said rolls in synchronism.

14. In a machine for stretching and softening leather, provided with a pair of opposed stretching rolls, each provided with spaced projecting parallel ribs having central portions substantially parallel to the axis of the roll for stretching the leather longitudinally, and lateral reverse spiral portions for effecting the stretching of the leather laterally, the ribs of each roll projecting between adjacent ribs of the opposed roll when said rolls are in operative relation, and means for driving said rolls in synchronism, the ribs of at least one of said rolls being each formed by a series of rolls of small diameter arranged end to end and having axial supports for each of said small diameter rolls disposed angularly to each other successively lengthwise of the stretching roll throughout the said reverse spiral portions thereof.

15. A stretching roll for leather stretching and softening machines provided with curved parallel substantially continuous ribs extending a uniform distance from the axis of the rolls throughout their length, the portions of said ribs adjacent to the center of the length of the roll and adjacent to their ends being substantially in alignment with the axis of the roll, and the intermediate portions of each of said ribs forming reverse spirals therefrom, said ribs being each formed by a series of rollers of small diameter placed end to end and having their axes successively disposed angularly to each other, throughout said reverse spiral portions.

16. A machine for stretching and softening leather provided with a pair of opposed stretching rolls, each provided with spaced projecting longitudinally disposed parallel non-cutting ribs, each rib having central portions and end portions disposed substantially parallel to the axis of the roll for effecting the direct stretching of the leather longitudinally, and lateral opposite spiral portions connecting said central and opposed portions for also effecting the stretching of the leather laterally, said ribs being of sufficient height to perform a staking operation on a piece of leather fed between them, and the ribs of each roll projecting centrally between the adjacent ribs of the opposed roll when said rolls are in operative relation, and means for driving said rolls in synchronism.

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