(No Model.)

4 Sheets—Sheet 1.

W. EVANS.

HIDE AND SKIN MACHINE.

No. 526,387. Patented Sept. 25, 1894.

Fig. 1.

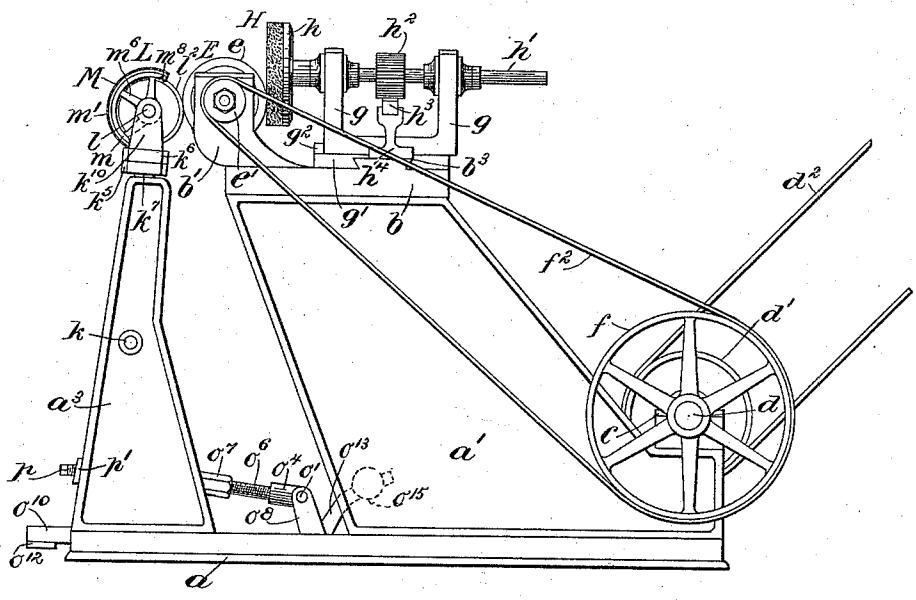
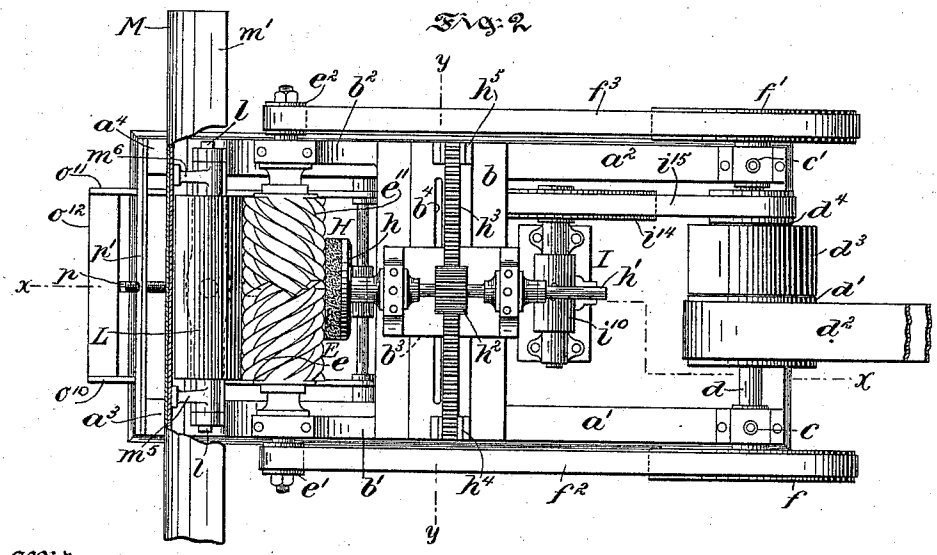


Fig. 2.



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(No Model.)

4 Sheets—Sheet 2.

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HIDE AND SKIN MACHINE.

No. 526,387. Patented Sept. 25, 1894.

Fig. 3

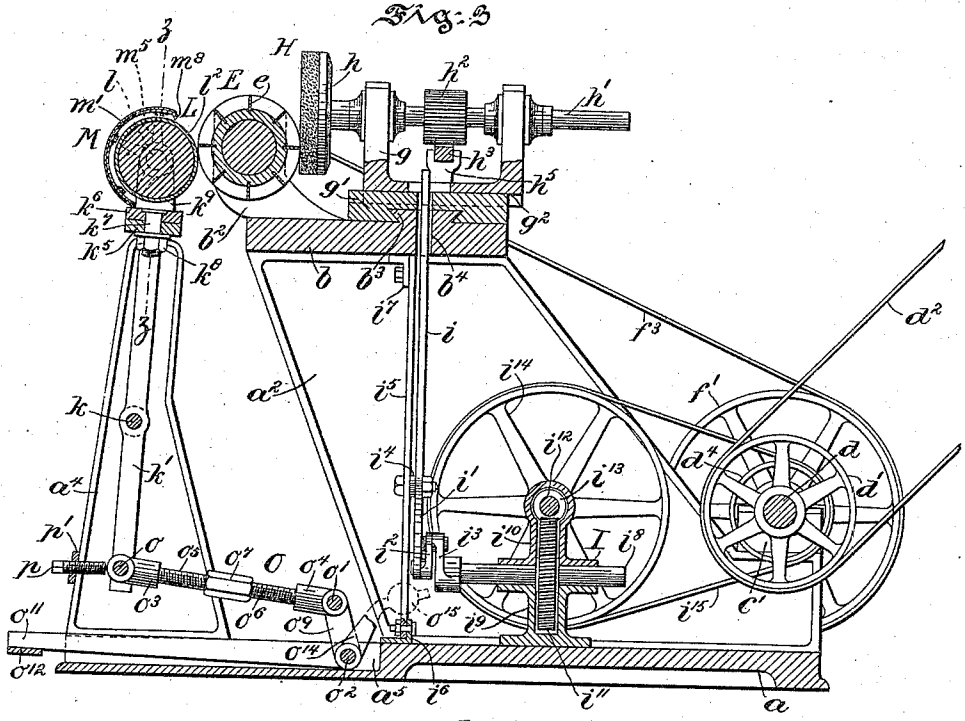
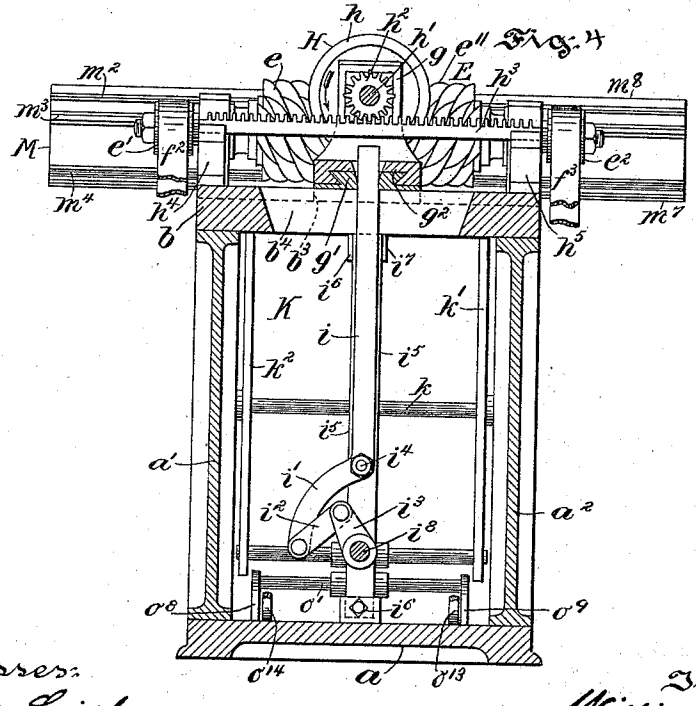


Fig. 4



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(No Model.) 4 Sheets—Sheet 3.

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HIDE AND SKIN MACHINE.

No. 526,387. Patented Sept. 25, 1894.

Fig: 5

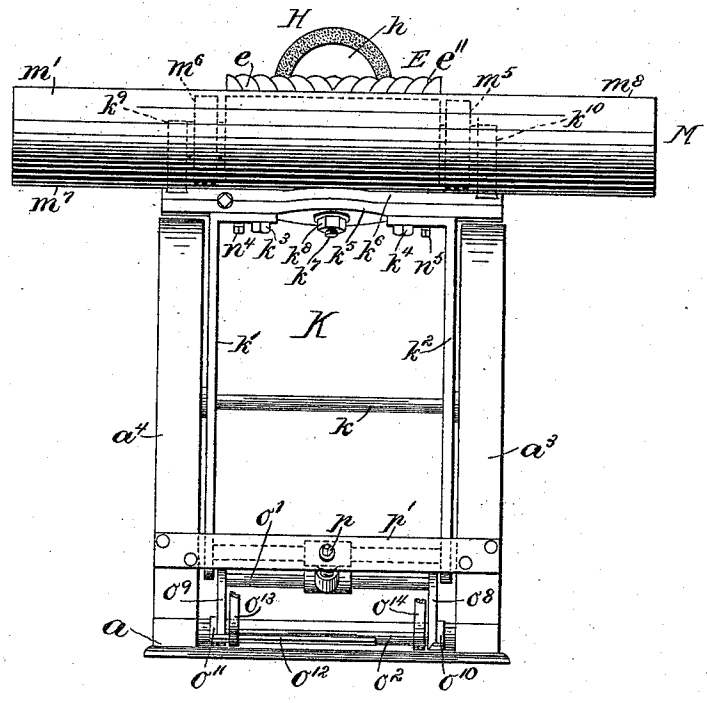


Fig: 8

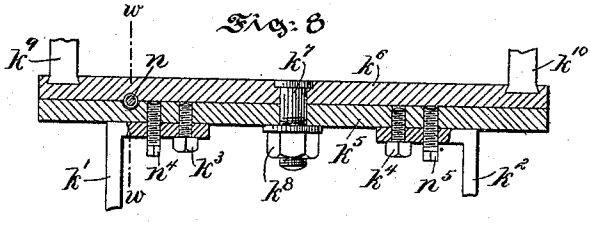
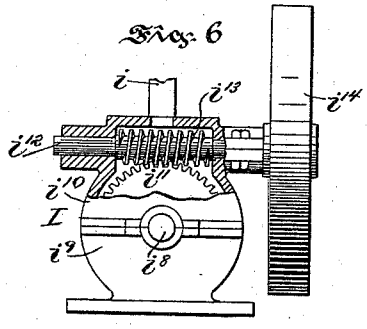


Fig: 6



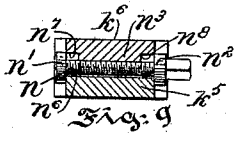
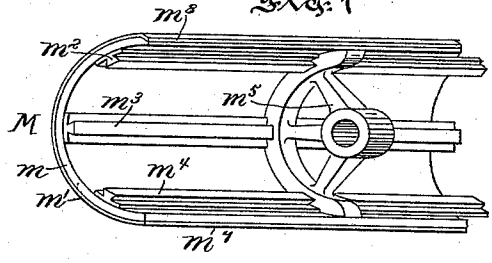


Fig: 9

Fig: 7



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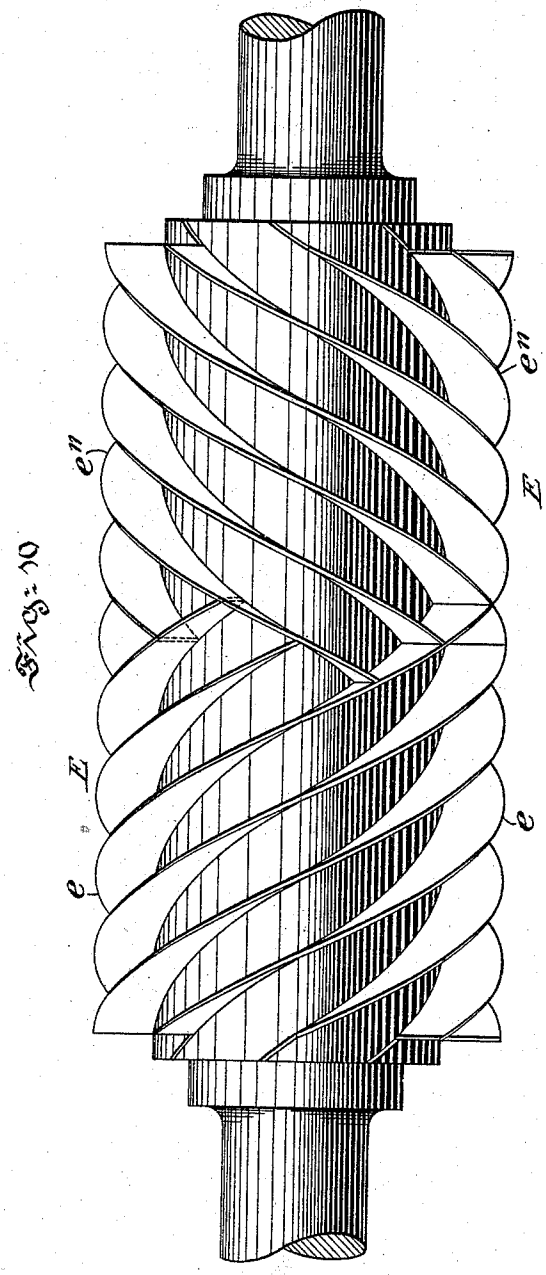

Fig. 10.

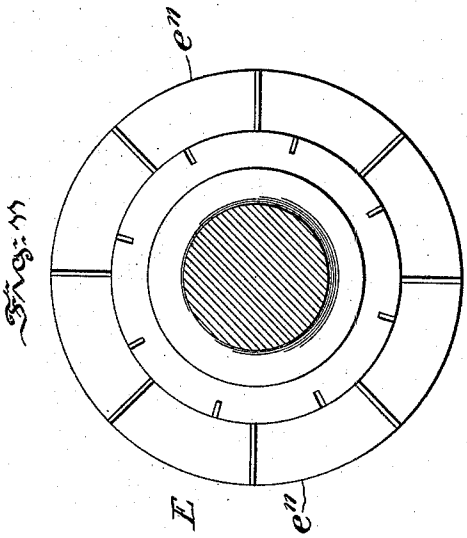

Fig. 11.

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UNITED STATES PATENT OFFICE.

WILLIAM EVANS, OF PHILADELPHIA, PENNSYLVANIA.

HIDE AND SKIN MACHINE.

SPECIFICATION forming part of Letters Patent No. 526,387, dated September 25, 1894.

Application filed April 23, 1894. Serial No. 508,613. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EVANS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Hide and Skin Machines, of which the following is a specification.

My invention has relation to machines for shaving, fleshing, skiving or frizzing hides, skins or leather; and in such connection it relates more particularly to the construction and arrangement of a machine for such purposes.

The principal objects of my invention are, first, to provide a hide dressing or finishing machine of comparatively simple construction, and such as is durable and efficient in action in its treatment of leather or skin in order to leave the same in a smooth condition, that is, without burrs, marks, ridges or the like thereon; second, to provide such a machine with a rotatable knife cylinder adapted to so treat the leather, hide or skin as to remove the matter therefrom in the form of straight shavings and thus to leave the entire surface thereof in a perfectly smooth condition; third, to provide a machine having the parts greatly simplified for effective action on the hide or skin; and, fourth, to provide such a machine with a rotary feeding device having a movable apron connected therewith in order to adapt the same for feeding leather, hide or skin of different dimensions to a rotary cutter cylinder and in such manner as to thoroughly act upon and leave the hide or skin in a perfect condition and with a smooth surface throughout the same for subsequent use.

My invention consists of a hide and skin shaving or fleshing machine provided with a rotary feeding roll having a complemental movable apron adapted to be so manipulated as to present hides or skins of different sizes to a rotary cutter cylinder and having a movable grinding device affording ranges of movement in transverse directions to the machine parallel with the position of the rotatable cutter cylinder so as to permit of the sharpening uniformly of the blades of said cylinder throughout the circumference of the same and during the rotation of the cylinder; and my invention further consists of the improvements in a hide or skin shaving or fleshing machine constructed and arranged in substantially the manner hereinafter described and claimed.

The nature, characteristic features and scope of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which—

Figure 1, is a side elevational view of a hide or skin shaving or fleshing machine embodying the features of my invention. Fig. 2, is a top or plan view thereof. Fig. 3, is a view on an enlarged scale partly in elevation and partly in section on the line x—x, of Fig. 2. Fig. 4, is a rear elevational view partly in section on the line y—y, of Fig. 2. Fig. 5, is a front elevational view of the machine of my invention. Fig. 6, is a rear detail view of the driving mechanism and means for controlling the movement of the support carrying the grinding device. Fig. 7, is a perspective view showing the detail construction of the internally feathered half cylinder apron with one of its sector bearings in engagement therewith for permitting thereby of the longitudinal movement of the same when the latter are in engagement with the respective journals of the rotary feeding device. Fig. 8, is an enlarged sectional view on the line z—z, of Fig. 3, showing the means for adjusting the position of the feeding roll and the half cylinder apron thereof in the direction of the cutter cylinder. Fig. 9, is a sectional view on the line w—w, of Fig. 8, showing the adjusting screw in elevation for controlling the position of the feeding roll and its half cylinder apron in the direction of the cutter cylinder of the machine. Fig. 10, is a front elevational view on an enlarged scale of the knife cylinder, showing the construction and arrangement of the two series of knives thereof; and Fig. 11, is an end view of the same.

Referring to the drawings a, is a base-plate on which are mounted and secured two standards a' and a^2, supporting a bed-plate b. These standards are provided with bearings c and c', for the reception of the main driving shaft d, of the machine. The bed-plate b, is provided with projections or arms b' and b^2, forming bearings for a cutter cylinder E.

On the shouldered end journals of the cutter cylinder E, are secured pulleys e' and e^2, actuated by means of belts f^2 and f^3, engaging pulleys f and f', rigidly secured to the main driving shaft d. The shaft d, is driven by means of a pulley d', and a belt d^2, from any suitable source of power.

d^3, is a pulley loosely mounted on the shaft d, and located adjacent to the fixed pulley d', thereof. The motion of the shaft d, is transferred to the cutter cylinder E, through the intervention of the pulleys f and f' and e' and e^2, and belts f^2 and f^3, as will be readily understood from Figs. 1 and 2, of the drawings.

It may be here remarked that the cutter cylinder E, will be driven at either a comparatively high or moderate rate of speed according to the size of the pulleys f and f', with respect to the pulleys e' and e^2.

The cutter cylinder E, is provided with two series of oppositely arranged spiral knives or blades e and e^{11}, located in grooves formed in the body of the cylinder therefor and the two series of knives having a reverse constant and uniform pitch in a longitudinal plane through the cylinder to the respective peripheries thereof and these knives or blades e and e^{11}, are so arranged as that two complementally arranged reverse spiral blades of the series of the cylinder meet each other at a center point of the cylinder and in reverse directions of constant and uniform pitch to the terminal points thereof at or about the peripheral ends of the cylinder and parallel to lines passing through points of contact of one with another at the center thereof, whereby the two series of blades e and e^{11}, of the cylinder so arranged in action upon a hide or skin, treat the same in a straight line and in such manner as that the matter thus removed is in the form of a straight shaving with the hide or skin left in a perfect condition, that is, with a smooth surface throughout the extent thereof.

The bed-plate b, is provided with a feather or miter joint b^3, formed preferably integral therewith and engaging a complemental groove or recess of a carrier plate g', having in sliding engagement with the same lengthwise of the machine a U-shaped support g, and also adapted to be afforded in a manner to be hereinafter explained a range of movement transversely of the rotary movement of the cutter cylinder E, as will be readily understood by reference to Figs. 2 and 3. The U-shaped support g, is provided with a feather g^2, formed integral therewith and on which the support g, has a range of longitudinal movement in the direction of the cutter cylinder E. The support g, forms the bearings for a shaft h', provided at the left hand end thereof with a grind-stone H. This grind-stone H, comprises an annulus composed of suitable gritty material, such as emery or other preferred material, and secured into a disk h.

The arrangement of the grinding device H, is such as that the same contacts at two points thereof with the two series of knives or blades e and e^{11}, of the cylinder E, in order that the same in action may uniformly sharpen the two series of reversely arranged blades e, of the cylinder E, throughout in the travel of the same in the path thereof.

It may be here remarked that the circumference of the grind-stone H, is preferably about double the length of the cutter cylinder E, so that the same when set in rotation may be moved along parallel to but in contact with the cylinder E, through the intervention of mechanism to be hereinafter fully described, making in its travel the length of the cylinder, but a single revolution, whence it is reversed and returned to the other end of the cylinder, but during such return it should be borne in mind is in contact therewith. On the shaft h', is mounted and secured thereto a pinion h^2, which meshes with a rack h^3, held in recessed I-bars or supports h^4 and h^5, secured into the feather or miter joint portion b^3, of the bed-plate b, as clearly illustrated in Figs. 1, 2, 3 and 4. The bed-plate b, is provided with an oblong slot b^4, as is also the carrier-plate g', and the support g, for the reception of the upper extremity of a lever-arm i, as illustrated in Figs. 3 and 4. The lever-arm i, is pivotally connected at i^4, to a vertical strip or bar i^5, connected with the base plate a, and the bed-plate b, by means of angle irons i^6 and i^7, as clearly illustrated in Figs. 3 and 4. The lower end i', of the lever-arm i, is bent or curved sidewise and pivotally connected with a link i^2, in pivotal connection with a crank arm i^3, secured to a shaft i^8, located in a divided casing I. Within the parts i^9 and i^{10} of the casing I, and on the shaft i^8, is rigidly mounted a worm-wheel i^{11}, which meshes with a worm-screw i^{13}, which is mounted on a shaft i^{12}, located in the upper part of the casing I, as illustrated in Figs. 3 and 6. On the right hand end of the shaft i^{12}, is mounted a pulley i^{14}, engaged by a belt i^{15}, which is driven by a pulley d^4, secured to the main driving shaft d, of the machine. In the rotation of the shaft d, by means of the pulleys d^4 and i^{14}, and the belt i^{15}, motion will be imparted to the worm-screw i^{13}, and in turn to the worm-wheel i^{11}, and shaft i^8, which by means of the crank-arm i^3, link i^2, and lower end i', of the lever-arm i, the latter will be given a swinging motion within the slot b^4, of the bed-plate b, to actuate the U-shaped support g, and to shift the same back and forth in the bed-plate b, parallel to the position of the cutter cylinder E. This back and forth movement of the support g, is adapted to rotate the grind-stone H, through the intervention of the rack h^3, and pinion h^2, on the shaft h', as will be clearly understood by reference to Figs. 2 and 3. The respective series of blades e and e^{11}, of the cutter cylinder E, will thus be sharpened by the grind-stone H, uniformly throughout the same, that is to say, without

leaving a fin on the edges of the blades as hitherto has been the case by the arrangement of the grinding devices with respect to the cutter cylinder in machines of the general type embodying my invention, which has been found in practice to be highly objectionable, because in their action on the skin, burrs, marks, or ridges have been left on the surface thereof.

It should be borne in mind that the grindstone H, during the shifting of the same parallel to the normal position of the cutter cylinder E, makes a single revolution, while of course the cutter cylinder E, according to the size of the pulleys f and f', and e' and e^2, with respect to each other may make several thousand revolutions to one of said grinding device. The difference in speed between the cutter cylinder and the grinding device prevents uneven grinding of the blades of the cutter cylinder E, at or about their ends, that is, the diameter of the knife cylinder will not be less at the ends than at other points or portions thereof, as was the case in the use of a grinding device, as hitherto employed whether the cylinder ran at a higher speed than the grinding device or whether they both ran at a uniform rate of speed and as a consequence this uneven grinding away of the knife cylinder caused ridges or decided marks to be present in the treated hide or skin, which depreciated the value thereof. This is entirely avoided by the arrangement as hereinbefore described and operating in conjunction with one another as stated.

In front of the standards a' and a^2, at the operator end of the machine are two standards a^3 and a^4, which are mounted on or secured to the base plate a, and form a bearing for a shaft k, of a frame K, supporting a feeding roll L, having a semi-circular apron M, which are held in position adjacent to the cutter cylinder E, as will be hereinafter fully described. On the shaft k, are journaled rods or bars k' and k^2, the upper ends of which are bent at right angles and by means of set screws k^3 and k^4, are secured to a bar k^5, which carries another bar k^6, which is pivotally connected therewith by means of a bolt k^7, and nut k^8, as illustrated in Figs. 3, 5 and 8. The bar k^6, is provided with two brackets k^9 and k^{10}, forming a bearing for a shaft l, of the feeding roll L, which is provided with a rubber or other suitable covering l^2, adapted to form a yielding surface so as to be adapted to hold in required position a hide or skin opposite the cutter cylinder E, and so as to contact with the same for removing matter in the form of straight shavings due to the construction and arrangement of the knives or blades thereof and so as to leave the entire surface of the hide in a smooth condition, without burrs, ridges or the like. Between the brackets k^9 and k^{10}, and the feeding roll L, on the shaft l, are located sectors m^5 and m^6, provided with grooves m^7, for engaging complemental feathers or dove-tail joints m^2, m^3 and m^4, of the semi-circular apron M, as illustrated in Figs. 1, 2, 3, 4, 5 and 7, and in order to permit of the sliding of the apron thereon, for example, in position parallel to the position of the cutter cylinder E, during the rotation thereof, in order to compass the surface of the hide or skin undergoing treatment to thoroughly remove matter therefrom.

The apron M, is provided on the outer surface thereof with a rubber or other suitable covering m', adapted to give a yielding surface thereto. The sectors m^5 and m^6, support the apron a proper distance from the feeding roll L, and in such manner as that the same may occupy the position illustrated in the drawings, when not in use, with the lower edge m^7, thereof resting against the brackets k^9 and k^{10}, of the carrier K.

The apron M, may be manipulated by hand so that the feeding roll L, is concealed thereby and the hide or skin is presented therefrom to the cutter cylinder E, after the bone portion of the hide or skin has been treated or shaved by the employment of the feeding roll L, as the instrumentality for presenting the same to the cutter cylinder E, and to be hereinafter fully explained.

The apron M, is made of a greater length than the roll L, and is turned over the same until its upper edge m^8, comes in contact with the brackets k^9 and k^{10}, and is held in position by the same and opposite the cutter cylinder and in which position the feeding roll L, is of course not susceptible of use. The hide or skin being usually of a size greater than the length of the feeding roll can now be brought with its whole surface in contact with the cutter cylinder E, by simply shifting the apron M, in either direction on its sectors m^5 and m^6, and a skin or hide can be completely shaved by this arrangement without using a shaving machine of a size to correspond with such a hide. Between the bars or frames k^5 and k^6, of the carrier K, is located an adjusting screw n. This bar k^5, is provided with two tightening screws n^4 and n^5, as clearly illustrated in Figs. 5, 8 and 9. The adjusting screw n, located in a smooth surfaced groove n^6, of the bar k^5, is provided with two shoulders n' and n^2, which rest against the front surface of the lower bar or frame k^5, as illustrated in Fig. 9. The upper bar or frame k^6, is provided with a threaded portion n^3, which meshes with the thread of the adjusting screw n, so that when the same is turned in one or the other direction, the upper bar k^6, which swings over the bolt k^7, and carries the feeding roll L, and apron M, can be turned on the lower bar k^5, for which purpose the upper bar k^6, is provided with two apertures n^7 and n^8, adapted to receive the shoulders n' and n^2, of the adjusting screw n, in the actuation of the bar k^6. The tightening screws n^4 and n^5, pressing against the upper bar k^6, must be loosened at this time to allow a movement of the upper bar and afterward brought in contact to hold said bar in required position on the bar k^5.

This movement of the bar k^6, by means of the adjusting screw n, serves to regulate the position of the feeding roll L, and likewise the apron M, with respect to the rotary cutter cylinder E, to cause a skin or hide to be brought in contact with the same, that is, to engage respectively with the reversely arranged spiral blades e and e^{11} thereof, and so that matter to be removed may be effectually and expeditiously done and with the surface thereof free from ridges or the like, because such is calculated to depreciate the value of the same for various purposes, where absolute smoothness is essentially requisite.

In the lower ends of the rods or bars k' and k^2, of the carrier K, is located a shaft o, of the treadle mechanism O, which by means of T-shaped bearings o^3 and o^4, is in connection with threaded rods o^5 and o^6, tightened and loosened by means of a swivel connection o^7. The T-shaped bearing o^4, is in pivotal connection with a shaft o', which is mounted in vertical arms o^8 and o^9, secured to a shaft o^2, located in the recessed portion a^5, of the base-plate a, of the machine. To the shaft o^2, are rigidly secured longitudinal arms o^{10} and o^{11}, to the outer free extremities of which is attached a cross-bar o^{12}, and constitute a frame or treadle for the reception of the foot of the operator of the machine, as illustrated in Figs. 1, 2 and 3. The feeding-roll L, or its semi-circular movable apron M, will be presented adjacent to the cutter cylinder E, by means of the treadle and its accessories, as illustrated in Figs. 1 and 3, by the engagement of the foot with and depression of the cross-bar o^{12}, to cause the hide or skin to contact with the series of blades e and e^{11}, of the cylinder E. The range of movement of the treadle mechanism O, can be controlled by means of the swivel connection o^7, by the turning of the same either in one or the other direction, whereby the distance of the rods o and o', from each other by means of the right and left hand threaded bolts or rods o^5 and o^6, can be lengthened or shortened so as to bring the hide or skin nearer to or farther from the cutter cylinder E, as requirements demand in the treatment of hides or skins of different degrees of thickness. On the shaft o^2, and rigidly secured thereto are arms o^{13} and o^{14}, the free ends of which are counterweighted at o^{15}, and adapted to normally hold the treadle mechanism O, so that the feeding roll L, with its movable apron M, is maintained a proper distance from the cutter cylinder E, while the treadle mechanism O, is not in operation for the treatment of a hide or skin, or the machine is at rest.

To prevent the feeding roll L, or its movable apron M, in the manipulation of either one or the other being brought into such a position as to accidentally or otherwise in such position of the same with respect to the cutter cylinder E in action, destroy the hide or skin, an adjusting screw p, is located in a bar p', which is secured to the standards a^3 and a^4, and knocks in the operative position of the treadle mechanism O, against the T-shaped piece o^3, limiting thereby the range of movement of the feeding roll L, or apron M, toward the cutter cylinder E, and thus preventing any damaging action upon the hide or skin.

The mode of operation of the hide and skin machine hereinbefore described is, as follows:—The skin or hide is placed on the feeding roll L, and its apron M, with the bone part located opposite the cutter cylinder E, and a proper distance therefrom. The belt d^2, on the loose pulley d^3, of the main driving shaft d, is shifted onto the rigid pulley d', which imparts motion to the shaft d, and by means of the pulley f and f', belts f^2 and f^3, and pulleys e' and e^2, the cutter cylinder E, has rotary motion imparted thereto and at the same time the grinding device H, is set in motion and the support g, therefor is shifted along parallel with the position of the rotary cutter cylinder E, through the intervention of the lever-arm i, crank-arm i^3, shaft i^8, worm-wheel i^{11}, and worm-screw i^{13}, receiving their motion from the main driving shaft d, through the pulleys d^4 and i^{14}, and belt i^{15}. During the to and fro movement of the grinding device H, parallel to the position of the cutter cylinder E, that is, from left to right, as shown in Fig. 4, the same by means of the pinion h^2, and rack h^3, will rotate said device in the direction indicated by the arrow in Fig. 4. As soon as the grindstone H, has reached the end of its travel in contact with the circumferential surface of the cutter cylinder E, the same will be shifted in a reverse direction, that is, from the right toward the left; and moreover, the direction of rotation of the grindstone H, will be likewise reversed by means of the rack h^3, and pinion h^2. It will thus be seen that the blades e and e^{11}, of the cutter cylinder E, will be thoroughly sharpened throughout the same and any fin on the edges of the blades formed during the grinding of the blades in one direction will be removed in the reverse action of the same upon the blades, so that the blades of the cylinder during the operation of the machine will always be maintained in such condition for insuring the most beneficial results of the knives or cutters on the hide or skin, and for leaving the same in a smooth condition and without burrs, ridges or other objectionable marks thereon.

The hide or skin placed on the feeding roll L, is brought into contact with the cutter cylinder E, by depressing the cross-bar o^{12}, of the treadle mechanism O. The knives or blades of the cutter cylinder E, shave the hide or skin beginning from the center point of the cutter cylinder according to the arrangement of the blades thereof as illustrated toward the ends of the cutter cylinder in a straight line and remove matter therefrom in the form always of straight shavings, by reason of which the skin or hide is left perfectly smooth in

surface throughout the extent thereof. As soon as the bone portion of the hide or skin has been shaved in length corresponding to the length of the feeding roll L, the apron M, which has occupied an idle position such as illustrated in the drawings, is moved over the feeding roll, in order to take the place thereof. By shifting the semicircular apron M, in either one or the other directions on its sectors m^5 and m^6, the hide or skin can be brought quickly into contact with the blades or knives of the cutter cylinder E, rotating at a high rate of speed to effectually and expeditiously remove from the same required matter as hereinbefore described and so as to leave the skin or hide throughout its surface in a perfectly smooth condition, for subsequent use.

It will be manifestly obvious that as to minor details of construction and arrangement of parts of the machine, modifications may be made without departing from the spirit of my invention; and hence I do not wish to be understood as limiting myself to the precise arrangement of the machine as hereinbefore described; but

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A hide and skin machine provided with a movable bed carrying a support, a cutter cylinder, a rack, a shaft provided with a pinion and a grinding annulus having its plane parallel to the axis of said cylinder, a lever in engagement with said support and having means in pivotal connection with the crank arm of a shaft, the latter being rotated by mechanism actuated from the main driving shaft, substantially as and for the purposes set forth.

2. In a hide and skin shaving machine, a knife cylinder, a frame carrying a feed roll, a traveler grinding annulus having its plane parallel to the axis of said cylinder and means for rotating said cylinder and reciprocating said annulus, substantially as and for the purposes set forth.

3. In a hide and skin shaving machine, a knife cylinder, a grinding annulus having its plane parallel to the axis of said cylinder and adapted to contact with two different portions of the blades of said cylinder reversely arranged with respect to each other and so as to uniformly sharpen the same, substantially as and for the purposes set forth.

4. In a hide and skin shaving machine, a rotary knife cylinder provided with two series of reversely arranged blades of constant and uniform pitch from the center to the ends of the cylinder and the terminals of said blades being in a straight line through the meeting ends of two blades of the series of the cylinder at the center thereof, and a rotary grinding device having its plane parallel to the axis of said cylinder and adapted in the rotation of said cylinder to travel in contact with two different portions of said blades to uniformly sharpen the same, substantially as and for the purposes set forth.

5. In a hide and skin shaving machine, a rotatable knife cylinder, means for actuating said cylinder, a rotary grinding device having its plane parallel with the axis of said cylinder and adapted to travel back and forth in contact with said cylinder in its rotation at a speed differing from that of the said cylinder, substantially as and for the purposes set forth.

6. In a hide and skin shaving machine, a frame provided with a counterbalanced treadle mechanism, a knife cylinder, a feeding appliance connected with said frame and provided with feeding surfaces of different widths to adapt the same to the size of hide or skin to be delivered to said knife cylinder, and means, as described, for rotating said cylinder, substantially as and for the purposes set forth.

7. A hide and skin shaving machine provided with a rotary feeding roll journaled to an adjustable swinging frame having a feathered apron engaged by sectors mounted on the journals of said roll and a counterbalanced treadle mechanism connected with said frame, substantially as and for the purposes set forth.

8. A hide and skin machine provided with a feeding roll journaled to the swinging frame of a controlled treadle mechanism, an apron partially embracing said roll and afforded a movement lengthwise and around the same, a positively actuated cutter cylinder and a grinding device as described afforded two ranges of simultaneous movement by means of a rack and pinion and worm and screw mechanism from the main driving shaft controlling the actuation of said cylinder, substantially as and for the purposes set forth.

9. A hide and skin machine provided with a slotted movable bed carrying a slotted and feathered support, a rack, a shaft provided with a pinion and journaled to said support and said shaft having a grinding annulus engaging a disk mounted on said shaft, a lever-arm in engagement with said support and having a curved extremity in pivotal connection with a crank-arm of a shaft rotated by means of a worm and screw mechanism from the main driving shaft by means of pulley and belt connections, and a rotary cutter cylinder, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WILLIAM EVANS.

Witnesses:
THOMAS M. SMITH,
RICHARD C. MAXWELL.