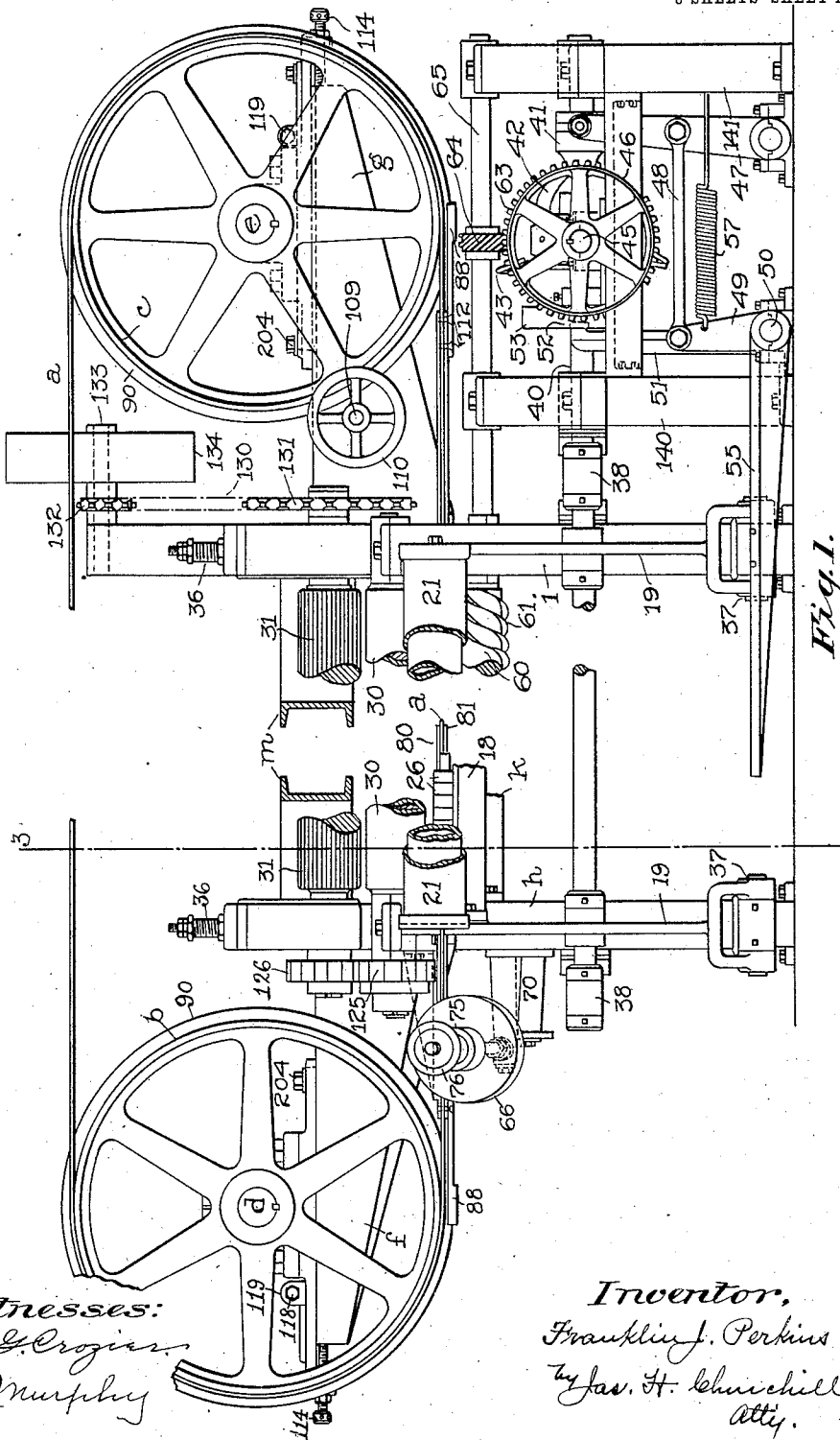


F. J. PERKINS.
BELT KNIFE FLESHING MACHINE.
APPLICATION FILED MAR. 26, 1910.

1,047,981.

Patented Dec. 24, 1912.

3 SHEETS—SHEET 1.



Witnesses:
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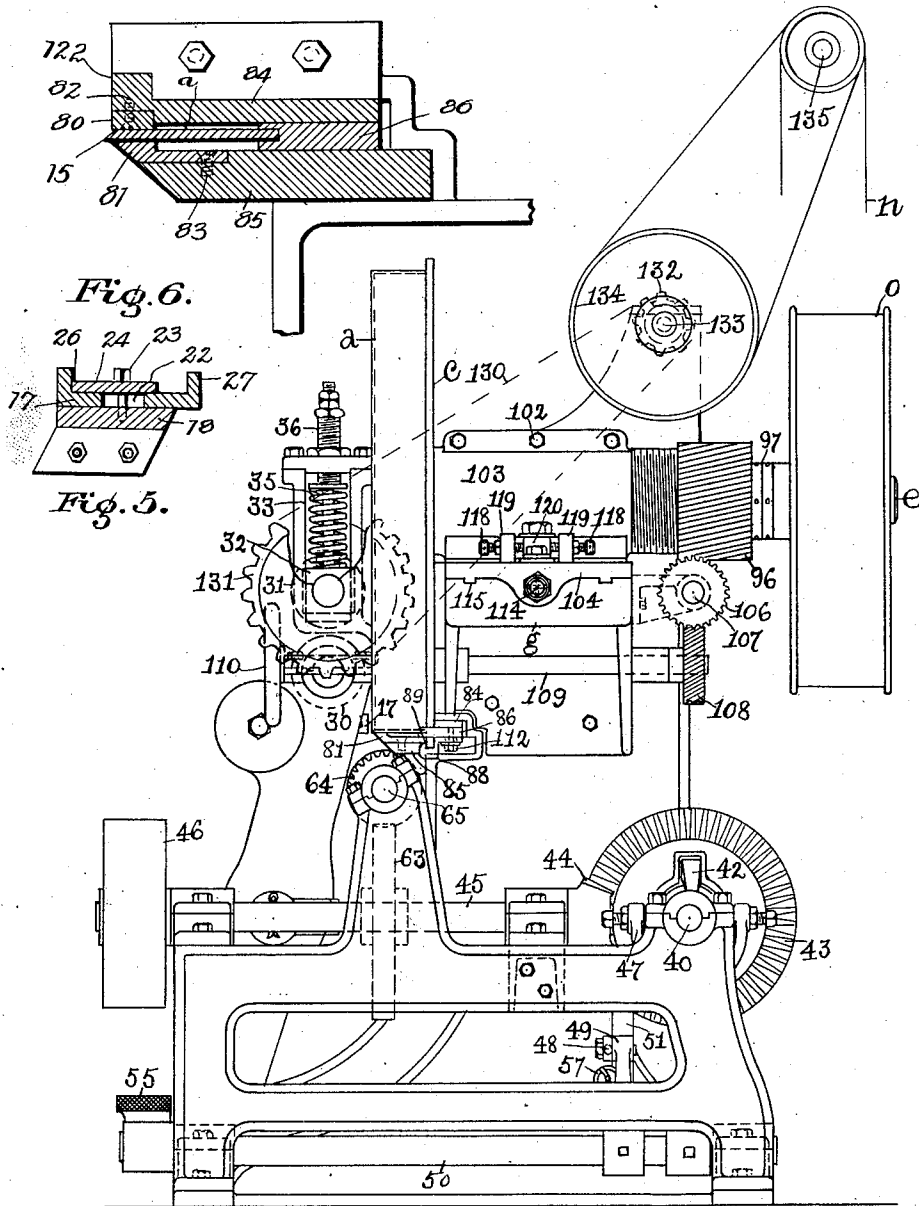
Inventor,
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3 SHEETS-SHEET 2.



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Fig. 2.

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3 SHEETS—SHEET 3.

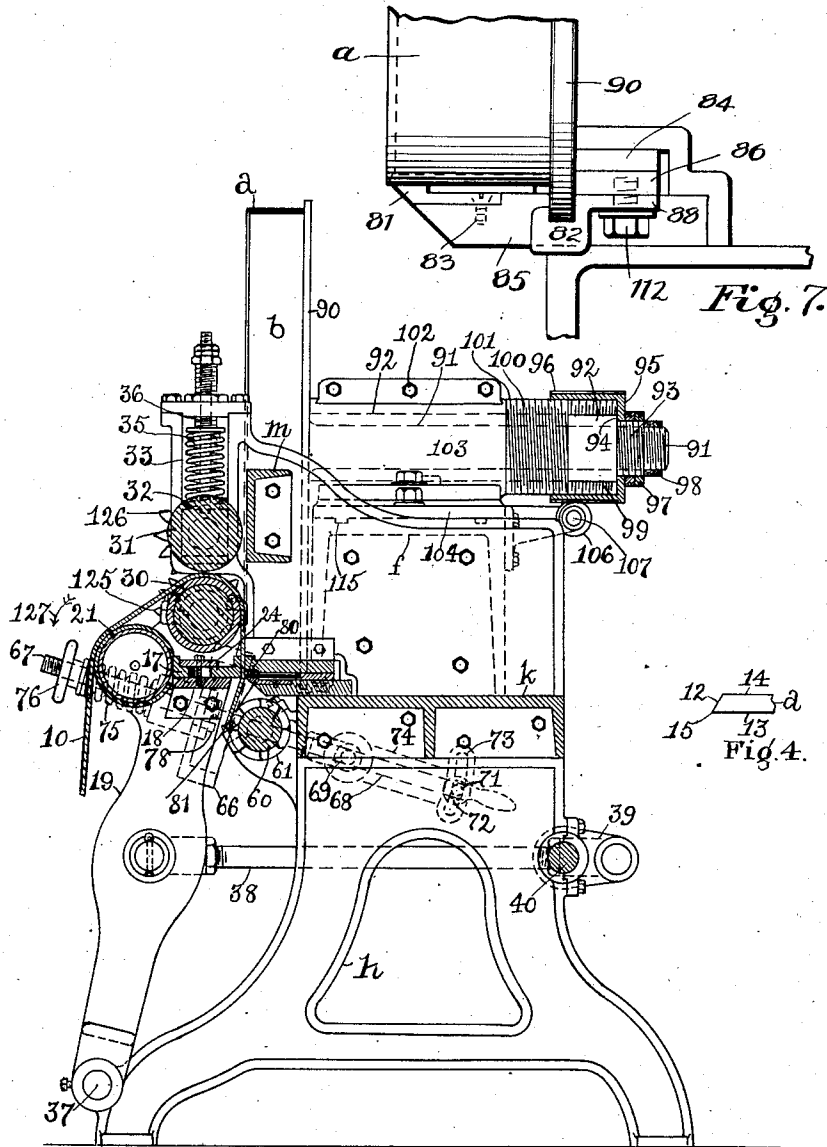


Fig. 3.

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UNITED STATES PATENT OFFICE.

FRANKLIN J. PERKINS, OF WOBURN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TURNER TANNING MACHINERY COMPANY, OF PEABODY, MASSACHUSETTS, A CORPORATION OF MAINE.

BELT-KNIFE FLESHING-MACHINE.

1,047,981.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed March 26, 1910. Serial No. 551,751.

To all whom it may concern:

Be it known that I, FRANKLIN J. PERKINS, a citizen of the United States, residing in Woburn, county of Middlesex, and State of Massachusetts, have invented an Improvement in Belt-Knife Fleshing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a machine for treating hides, skins and leather, and is herein shown as embodied in a machine especially adapted for effectively fleshing hides and skins.

In accordance with this invention, the machine is provided with a plurality of movable backing sections for one surface of the hide or skin to bear against while the other surface is being acted upon by a knife, preferably a movable knife in the form of an endless band or belt. The backing sections may be made of rigid and substantially indestructible material and are capable of moving individually to compensate for uneven thickness of the hide or skin and are normally forced forward into their operative position by a yielding bed, which may be in the form of a pneumatic roll. Provision is made for drawing the hide or skin transversely with relation to the cutting edge of the knife, and also for spreading or smoothing out the hide or skin before it is presented to the knife. The knife has co-operating with it a grinder, which is adjustable with relation to the knife to obtain any desired bevel or inclination of the cutting edge, and which is maintained in contact with the latter with a constant pressure. Provision is also made for adjusting the knife with relation to the path of movement of the hide or skin to compensate for wear on the knife. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a front elevation with parts broken away of a belt knife fleshing machine embodying this invention. Fig. 2, an end elevation of the machine shown in Fig. 1, looking toward the left. Fig. 3, a vertical transverse section on the line 3-3, Fig. 1,

looking toward the left, and Figs. 4 to 7, details to be referred to.

Referring to the drawings, *a* represents an endless belt or band knife, which is passed about pulleys or wheels *b, c*, on shafts *d, e*, having bearings in brackets or arms *f, g*, attached to upright sides *h, i*, of the framework of the machine, said upright sides being separated from each other and connected as herein shown by a bed plate *k* and tie bar *m*. The endless belt knife *a* may be driven as herein shown by a belt *n*, which is passed about a pulley *o* on the shaft *e*, or in any other suitable manner. The lower half or part of the endless belt knife *a* is designed to act on the hide or skin 10, and for this purpose said knife is provided with an inclined front face 12 (see Fig. 4), which extends upwardly and rearwardly from the lower or bottom face 13 to the upper face 14, so as to form a cutting edge 15 at the lower side of the knife, as the latter is presented to the work. The knife *a* has co-operating with it a support for the hide or skin 10, preferably made as herein shown, and comprising a plurality of rigid presser members, such as metal bars 17 (see Figs. 3 and 5), which are arranged side by side on a supporting cross plate or bar 18 extended between upright levers 19, forming one form of support for a yielding backing for the presser members 17, which backing may be in the form of a roll 21, preferably a pneumatic roll of known construction.

The rigid presser members or bars 17 extend transversely of the cross plate or bar 18 and are capable of individual movement thereon, which may be effected as herein shown by providing each bar or member 17 with a slot 22, through which is passed a guiding pin or bolt 23, whose threaded lower end enters a threaded socket in the supporting plate or bar 18 and whose head engages a retaining plate or bar 24, which engages the upper surface of all of the presser members or bars 17 and keeps them down on the supporting cross bar 18. Each presser member 17 is provided at its end which engages the hide or skin with a substantial bearing surface and to economize in weight, said member is made substantially thin and

is provided preferably at both ends with upwardly extended fingers 26, 27, the latter cooperating with the thickness of the bar to form a substantial bearing or backing for the hide or skin.

Provision is made for drawing the hide or skin in a plane substantially at right angles to the path of movement of the belt knife, and for this purpose, I have provided the feed rolls 30, 31, the feed roll 30 being journaled in the levers 19, and the feed roll 31 as shown being journaled in movable boxes 32 (see Figs. 2 and 3) which slide in vertical slots 33 in the framework of the machine and are yieldingly backed up by springs 35, whose strength is regulated by the adjusting screws 36.

The lower feed roll 30, the bed roll 21 and presser members 17 are moved into and out of their operative position by moving the levers 19 toward and away from the knife, and in the present instance, the levers 19 are operated by power. To this end, the levers 19 which are pivoted at their ends at 37, are connected at or about their center by rods or links 38 to cranks 39, only one of which is shown in Fig. 3, fast on a shaft 40, having bearings in the side frames *h*, *i*, and in additional uprights 140, 141, which form part of the framework of the machine. The shaft 40 is designed to be intermittently rotated, and for this purpose, said shaft is provided with a clutch, one member 41 of which is keyed to the shaft and co-operates with a second member 42 carried by a bevel gear 43, normally loose on the shaft but adapted to be rendered fast thereon by engagement of the clutch member 41 with the clutch member 42.

The bevel gear 43 is driven continuously by a bevel pinion 44 fast on a shaft 45 provided with a pulley 46. The clutch member 41 is operated by a lever 47 connected by a link 48 to a crank 49 on a rock-shaft 50, which is provided with a second crank or arm 51 having a finger 52, which is designed to enter substantially diametrically opposite slots or recesses (not shown) in a disk 53 fast on the crank shaft 40, to arrest rotation of the latter at each half revolution, unless said finger is prevented from entering one of the recesses in the disk 53, by the operator depressing a foot treadle 55 fast on the rock-shaft 50. The finger 52 and disk 53 constitute a known form of stop mechanism, in which the finger 52 is withdrawn from a recess in the disk 53 by the operator depressing the foot treadle 55, at which time the clutch lever 47 is operated to throw in the clutch and connect the gear 43 with the crank shaft 40. While the crank shaft 40 is making a half revolution, the operator can remove his foot from the treadle, as the finger 52 at such time engages the face or side of the disk 53 and retains the clutch

member 41 in engagement with its cooperating member 42, until the crank shaft has made a half revolution, at which time, a second recess on the disk 53 is brought into line with the stop finger 52 and the latter is forced into the said recess by the spring 57, which also disconnects the clutch member 41.

Provision is made for spreading or smoothing out the hide or skin before it is presented to the action of the knife, which is accomplished as herein shown, by a spreading roll 60 provided with helically arranged blades, vanes or ribs 61 and of known construction, which is located below the knife *a* and is driven from the shaft 45 by a spiral gear 63 thereon, which meshes with a like gear 64 fast on the shaft 65 of the spreading roll. Provision is also made for keeping the cutting edge of the knife sharp and of the proper or desired bevel or inclination, and for this purpose, I have provided a grinder 66, which is mounted on the round arm 67 of a lever 68 pivoted at 69 to a boss 70 attached to the side upright *h*, said lever carrying a set screw 71, which engages a block 72 sliding in a curved slot 73 in an arm 74 attached to the framework. The grinder 66 is pressed against the edge of the knife by a spring 75 encircling the arm 67 of the lever and whose pressure is regulated by the nut 76 engaging the threaded end of the lever arm 67 (see Fig. 3).

By means of the spring 75 and nut 76, the pressure of the grinder on the knife can be regulated, and by means of the pivoted lever 68, the grinder can be presented to the knife at different angles so as to obtain any desired angle or inclination of the face 12 of the knife to obtain a deeper or shallower cut. The grinder may be positioned with relation to the knife by a nut 78, which engages the threaded arm 67 of the lever 68 and against which the grinder is pressed by the spring 75.

Provision is made for maintaining the portion of the knife *a*, which acts on the hide or skin, substantially rigid or firm, which is accomplished by means of an upper jaw 80 and a lower jaw 81 (see Figs. 3 and 6), which are extended between the side uprights *h*, *i*, and are secured as by screws 82, 83, to upper and lower supporting bars 84, 85, suitably secured to the framework of the machine, and between which is located a backing plate or bar 86 for the knife *a*.

Provision is made for feeding or adjusting the knife *a* forward or toward the grinder 66, so as to keep the cutting edge of the knife in the desired or proper working position, and for this purpose, the backing plate or bar 86 is provided at its opposite ends with extensions 88 having grooves 89 for the reception of the flanges 90 of the wheels *b*, *c*, over which the belt knife is passed, (see Figs. 1 and 7), whereby the

back plate 86 is operatively connected with said wheels to move therewith when the latter are moved axially to adjust the knife *a*.

The axial movement of the wheels *b*, *c*, may be effected after the manner represented in Figs. 2 and 3, and as will now be described. To this end, each of the wheels or pulleys *b*, *c*, has its shaft 91 extended through a bearing sleeve 92, which is provided with a threaded reduced end portion 93 forming a shoulder 94, against which the end disk 95 of a worm 96 is firmly clamped by the nuts 97. The bearing sleeve 92 is held on the shaft against longitudinal movement thereon by nuts 98, which engage the threaded end of the shaft and bear against the reduced end 93 of the sleeve 92. The worm 96 is provided on its inner circumference with screw-threads 99, which engage screw-threads 100 on the exterior of a sleeve 101, through which the bearing sleeve 92 is extended, and which is stationary, it being clamped as by bolts 102 to a housing 103, which is adjustably secured to a supporting plate or bar 104, which in turn is adjustably secured to the stationary brackets *f*, *g* attached to an upright side of the framework of the machine. The worm 96 on the sleeve 92 of each wheel or pulley engages a worm gear 106 on a shaft 107 supported by the framework, and one of said worm gears meshes with and is rotated by a worm 108 on a shaft 109 extended from the rear to the front of the machine and provided with a hand wheel 110 under control of the operator.

By reference to Figs. 2 and 3, it will be seen that the operator by turning the hand wheel 110 rotates the shaft 109 and worm 108, which rotates the gears 106 on the shaft 107, and said gears rotate or turn the worms 96. As the worms 96 are turned, they are caused to travel on the sleeves 101 by means of the screw-threads 99, 100, and as the worms are thus moved they carry with them the bearing sleeves 92 and the pulleys or wheels *b*, *c*, against which the front end of said bearing sleeves abut. The pulleys or wheels *b*, *c*, carry with them the grooved plates or bars 88, which are attached to the back plate 86 for the knife as by the screws 112. In this manner, the belt knife is accurately adjusted with relation to the work its entire length. Provision is made for taking up slack in the belt knife or in other words for adjusting the said knife longitudinally, which is effected by adjusting screws 114 carried by the plate or bar 104 and engaging the supporting brackets *f*, *g*, having longitudinally extended guideways 115 for guide ribs on the under side of the plate or bar 104, which is fastened in its adjusted position by the screws or bolts 204. The housing 102 for the stationary sleeve 92 is capable of adjustment or movement trans-

versely on the plate or bar 104, which may be effected as shown in Fig. 2, by adjusting screws 118 extended through lugs 119 on the upper surface of the plate or bar 104 and engaging the opposite sides of an arm 120 extended from the housing 103. By means of the screws 118, the initial adjustment of the knife pulleys or wheels may be effected. The plate or bar 81 carrying the upper jaw 80 of the knife is provided with a substantially straight face 122, which is opposite the presser members 17, and coöperates therewith to form a guide for the treated portion of the hide.

The operation of the machine may be briefly described as follows:—The operator throws the hide or skin to be fleshed over the feed roll 30 when the latter is in what may be termed its inoperative position, that is, with the levers 19 moved away from the knife *a*. After the hide or skin has been placed over the feed roll 30, the operator depresses the foot treadle 55 so as to start the machine and cause the shaft 40 to rotate, and through the cranks 39 and links 38 move the levers 19 into substantially the position shown in Fig. 3, and at or about the time the feed roll 30 and the presser members 17 have been brought into their operative position, the shaft 40 is arrested by the stop finger 52 and disk 53, if the operator has in the meantime released the foot treadle. As soon as the feed roll 30 is brought into operative relation to the feed roll 31, they are rotated by the gears or toothed wheels 125, 126, so as to feed the hide or skin out of the machine in the direction indicated by the arrow 127. The feed roll 31 may be driven by the link chain 130, passed about a sprocket wheel 131 on said roll and a sprocket wheel 132 on a shaft 133, which is provided with a pulley 134, the latter being driven from a counter shaft 135 above the machine. As the hide or skin is thus fed out of the machine, it is drawn past the knife *a*, which in practice may be run continuously, and the cutting edge 15 of said knife cuts into the flesh side of the hide or skin and removes the flesh therefrom. While the hide is being cut by the knife, it is firmly supported or backed up by the presser members 17, which are capable of yielding to compensate for different thicknesses of the hide, so that the latter may be fleshed by the knife in the proper or desired manner. After one half of the hide has been fleshed as described, the operator depresses the foot treadle 55 to cause the shaft to make another half revolution and thereby move the levers 19 into their inoperative position, and when in this position the shaft 40 is again arrested by the stop mechanism. The operator reverses the hide or skin to bring the unfleshed part into position to be acted upon by the knife, when the levers 19 are again brought

into their operative position. The presser members 17 constitute one form of bed to support the hide or skin while it is being acted upon by the knife. The portion of the hide or skin below the knife is smoothed or spread out by the revolving blade roll 60, so that the hide or skin may be presented in the best manner for effectively fleshing the same by the knife.

It will be observed that in the operation of the machine, the hide or skin is drawn or moved in a path substantially at right angles to the cutting edge of the knife, which in the present instance is a movable knife and these two movements produce a clean and effective cutting off or removal of the fleshy parts from the hide or skin, whereby the latter is most effectively fleshed. It will also be observed that the cutting face of the knife extends in the direction of the travel of the hide or skin and that the lower edge of said face constitutes the cutting edge of the same. It will further be observed that the presser members constitute one form of bed or support for the hide or skin and that they are yieldingly pressed forward by the yielding bed roll. The presser members can thus be made of metal or other rigid material, which is substantially indestructible by the dirt in the hide or skin with which they make contact, thereby enabling the bed to be used a substantially long time without renewal and if any of the presser members should become worn, they can be replaced substantially in an instant. The levers 19 constitute one form of support for the bed for the hide or skin, but it is not desired to limit the invention in this respect.

I have herein shown one construction of machine embodying this invention, but I do not desire to limit my invention to the particular construction shown.

Claims.

1. In a machine of the class described, in combination, a movable belt knife, means to move it, guiding jaws between which said knife is moved, a support for the hide or skin cooperating with said knife and composed of presser members capable of movement toward and away from said knife, a yielding bed roll cooperating with said presser members, pivoted levers supporting said presser members and said yielding bed roll, a feed roll carried by said levers above said presser members, a second feed roll with which the first-mentioned feed roll co-operates to feed the hide or skin out of the machine and draw it past the cutting edge in a path substantially at right angles to the path in which the said knife is moved, a spreader roll located below said knife, and power-operated means for moving said levers into and out of their operative position, substantially as described.

2. In a machine of the class described, in

combination, a movable belt knife, means to move it, guiding jaws between which said knife is moved, a support for the hide or skin cooperating with said knife and composed of presser members capable of movement toward and away from said knife, a yielding bed roll cooperating with said presser members, pivoted levers supporting said presser members and said yielding bed roll, a feed roll carried by said levers above said presser members, a second feed roll with which the first-mentioned feed roll co-operates to feed the hide or skin out of the machine and draw it past the cutting edge in a path substantially at right angles to the path in which the said knife is moved, and means for moving said levers into their operative position, substantially as described.

3. In a machine of the class described, in combination, a belt knife, flanged pulleys or wheels about which said knife is passed, means to rotate said wheels, jaws between which said knife is moved, a backing plate for said knife, means for moving said pulleys in an axial direction, means to operatively connect said backing plate with said pulleys to effect movement of said backing plate and knife when the said pulleys are moved axially, and a support for the hide or skin cooperating with the knife as it travels between said jaws, substantially as described.

4. In a machine of the character described, in combination, a flat knife arranged in a substantially horizontal plane and having a cutting edge at the lower side thereof, a work support cooperating therewith and movable toward and away therefrom, and means located above the knife for drawing the work across the edge of the knife in a plane substantially at right angles to the knife, substantially as described.

5. In a machine of the character described, in combination, a substantially flat knife, a work-support cooperating therewith and movable toward and away therefrom, and means located above the knife for drawing the work across the edge of the knife in a plane substantially at right angles to the knife, and means located below the knife for spreading out the work before it is presented to the knife, substantially as described.

6. In a machine of the character described, in combination, a flat knife arranged in a substantially horizontal plane and having a cutting edge at the lower side thereof, a work-support cooperating therewith and movable toward and away therefrom, means located above the knife for drawing the work across the edge of the knife in a plane substantially at right angles to the knife, a grinder to act on said

knife, and an adjustable support for the grinder capable of presenting the grinder to the knife in different angular positions to vary the bevel or inclination of the cutting edge of the knife, substantially as described.

7. In a machine of the class described, in combination, a substantially flat knife, a work-support cooperating therewith and comprising a plurality of individual rigid members arranged substantially in the plane of the knife and capable of bodily movement toward and away from said knife, a support upon which said members slide toward and from the knife, and means for yieldingly forcing said members toward said knife, substantially as described.

8. In a machine of the class described, in combination, a substantially flat knife, a work-support cooperating therewith and comprising a plurality of individual rigid members arranged substantially in the plane of the knife and capable of bodily movement toward and away from said knife, and a support upon which said members slide toward and from said knife, substantially as described.

9. In a machine of the class described, in combination, an endless belt knife provided with an inclined face cooperating with the lower face of the knife to form a cutting edge, means for causing said knife to travel

in an endless path, a support for the work movable toward and from said knife, and means for drawing the work across the knife from beneath the same in a path substantially at right angles to the path traveled by the knife, substantially as described.

10. In a machine of the class described, in combination, an endless belt knife, means for causing said knife to travel in an endless path, a support for the work movable toward and from said knife, and means for drawing the work across the knife from beneath the same in a path substantially at right angles to the path traveled by the knife, substantially as described.

11. In a machine of the class described, in combination, a knife, a support for the work movable toward and from said knife, means for drawing the work across the knife in a path substantially at right angles thereto, and means to move said knife transversely of the hide and substantially at right angles to the path of movement thereof, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

FRANKLIN J. PERKINS.

Witnesses:

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J. M. MURPHY.