No. 849,158. PATENTED APR. 2, 1907.

G. B. NORGRAVE.

MACHINE FOR TREATING HIDES, SKINS, AND LEATHER.

APPLICATION FILED OCT. 6, 1906.

4 SHEETS—SHEET 1.

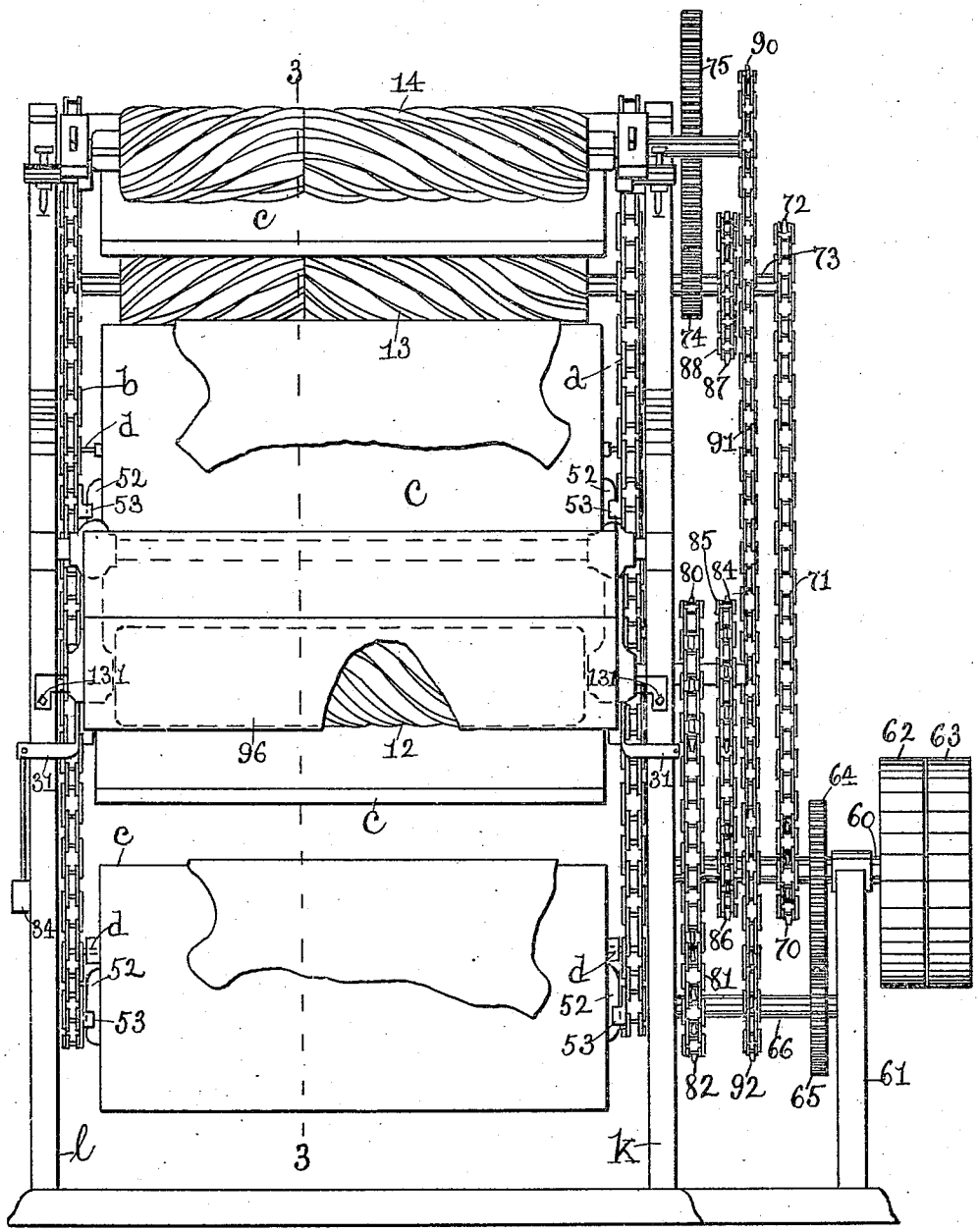

Fig. 1.

Witnesses.
C. N. Emmett
J. Murphy

Inventor.
George B. Norgrave
by Jas. A. Churchill
Atty.

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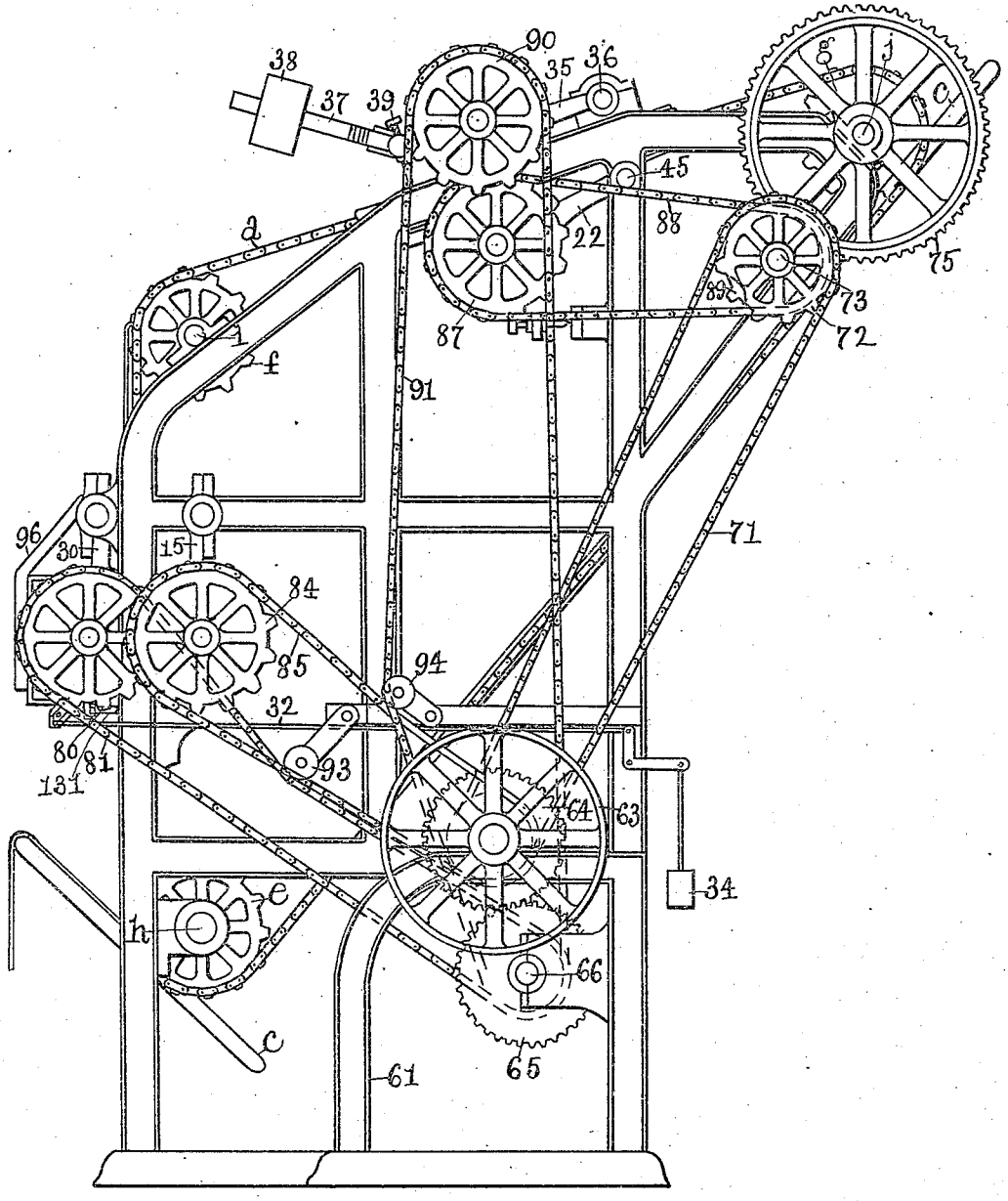

Fig. 2.

Witnesses.
C. H. Emmett
J. Murphy

Inventor:
George B. Norgrave
by Jas. A. Churchill
Atty.

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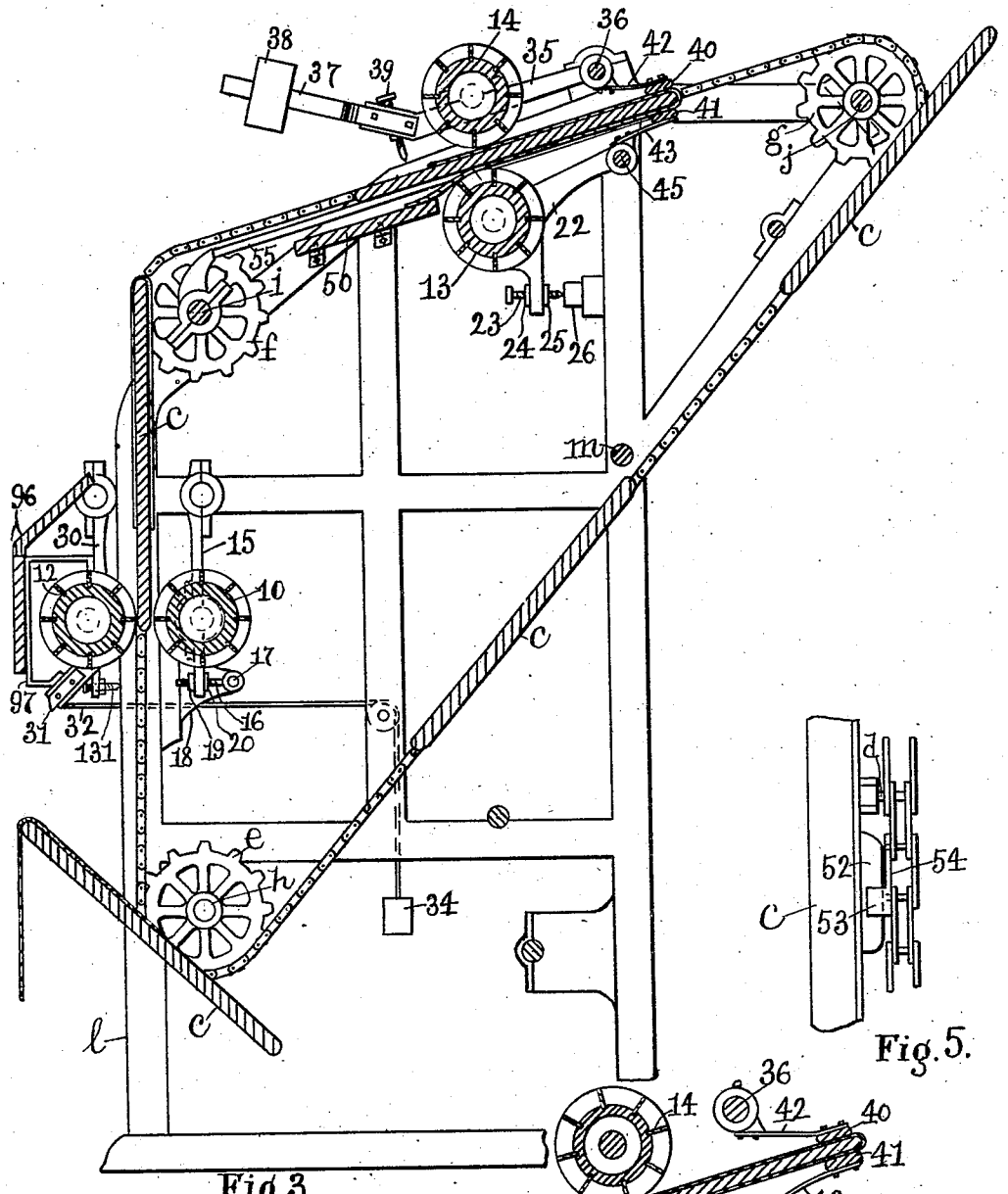

Fig. 3.

Fig. 5.

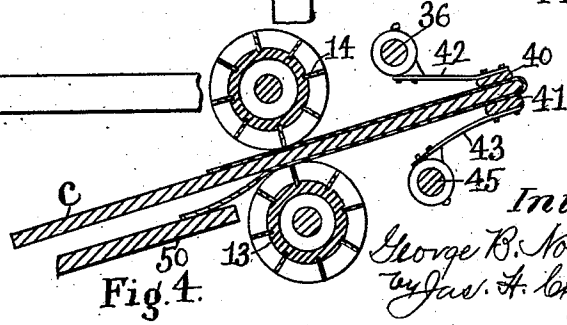

Fig. 4.

Witnesses.
C. H. Emmett
J. Murphy

Inventor:
George B. Norgrave
by Jas. A. Churchill
Atty.

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4 SHEETS—SHEET 4.

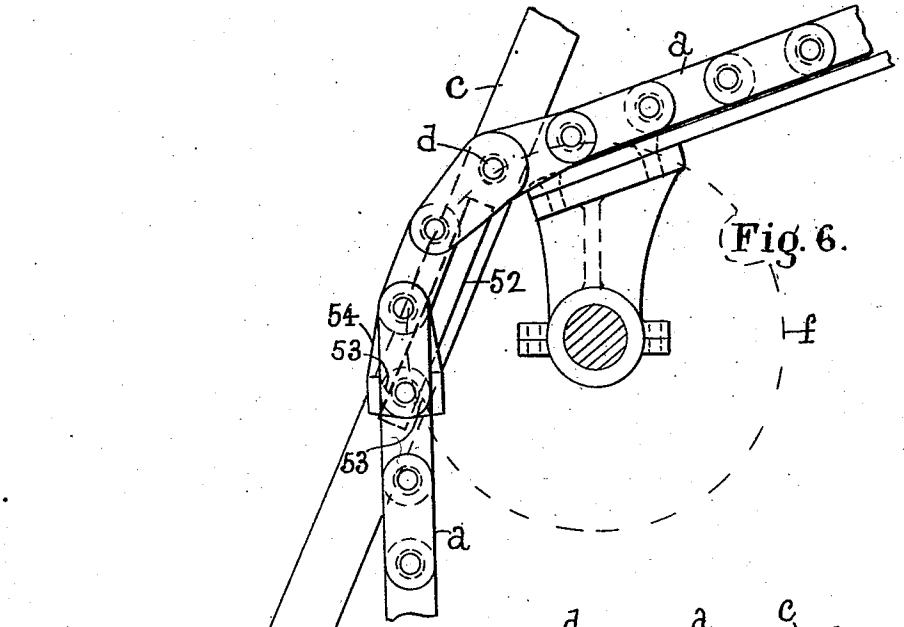

Fig. 6.

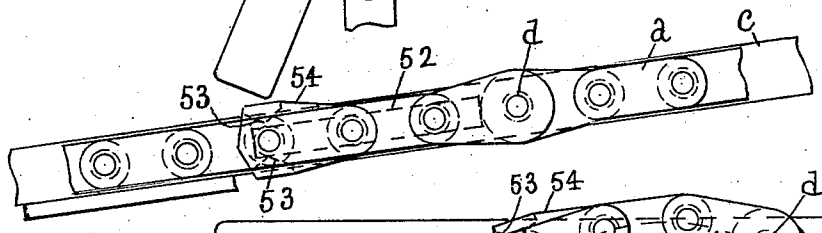

Fig. 7.

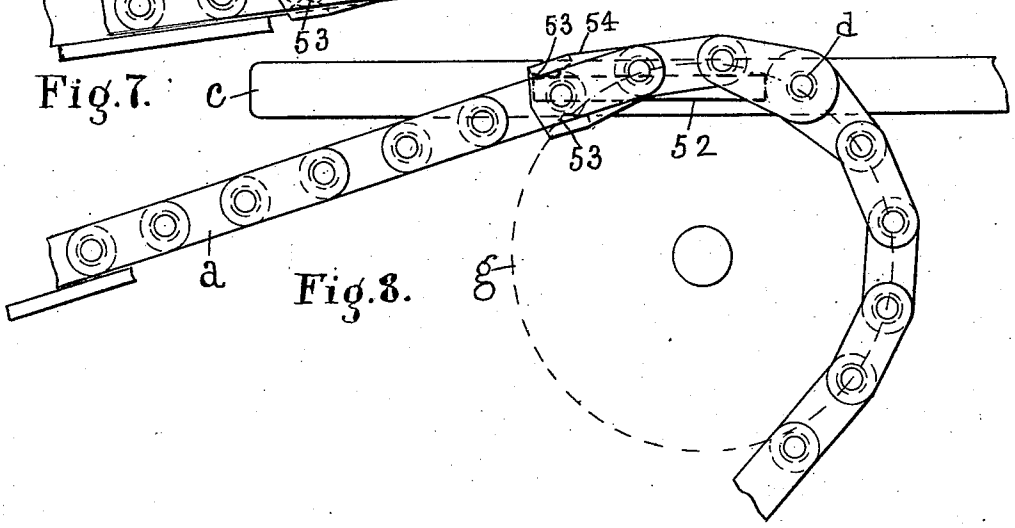

Fig. 8.

Witnesses.
C. H. Garnett.
J. Murphy.

Inventor.
George B. Norgrave
by Jas. H. Churchill
Atty.

UNITED STATES PATENT OFFICE.

GEORGE B. NORGRAVE, OF PEABODY, MASSACHUSETTS, ASSIGNOR TO PEABODY LEATHER MACHINERY COMPANY, OF PEABODY, MASSACHUSETTS, A CORPORATION OF MAINE.

MACHINE FOR TREATING HIDES, SKINS, AND LEATHER.

No. 849,158. Specification of Letters Patent. Patented April 2, 1907.

Application filed October 6, 1906. Serial No. 337,673.

To all whom it may concern:

Be it known that I, GEORGE B. NORGRAVE, a citizen of the United States, residing in Peabody, in the county of Essex and State of Massachusetts, have invented an Improvement in Machines for Treating Hides, Skins, and Leather, 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 of that class in which a plurality of substantially flat tables or supports are employed and known as a "serial-table" machine.

The present invention has for its object to provide a machine of the class referred to which is simple in construction, efficient in operation, and one with which a maximum number of hides or skins may be put out, unhaired, or otherwise treated in a superior manner and in a minimum time and with which the hide or skin on both sides of the table may be smoothed out or otherwise manipulated by the operator prior to being acted upon by the working tools.

The machine is constructed as will be described, so that for some kinds of work a single operator is enabled to manipulate the hide or skin in such manner that the complete or whole surface of the hide or skin can be treated or operated upon while engaged with the sides of the table on the passage of the hide or skin once through the machine.

The particular features of the invention will be pointed out in the claims at the end of this specification.

Figure 1 is a front elevation of a machine embodying this invention; Fig. 2, an end elevation of the machine shown in Fig. 1; Fig. 3, a vertical section on the line 3 3, Fig. 1, looking toward the left; and Figs. 4, 5, 6, 7, and 8, details to be referred to.

Referring to the drawings, *a b* represent link chains constituting an endless carrier for a plurality of substantially flat tables or work-supports *c*, herein shown as five in number, and each of which is pivoted near its center upon studs or pins *d*, (see Figs. 1 and 5,) attached to or forming part of the endless carrier. Each of the link chains *a b* is passed about sprocket-wheels *e f g*, mounted on shafts *h i j*, supported by uprights *k l*, connected by tie-bars *m* and forming a framework for the machine. The sprocket-wheels *e*, *f*, and *g* are arranged, as herein shown, so that the endless carriers *a b* travel in a triangular path, having a vertical portion at the front of the machine, an upwardly-inclined portion extended from the front to the rear of the machine, and a downwardly-inclined portion extended from the rear to the front of the machine, the side frames *k l* being suitably shaped to carry out this arrangement. By means of this arrangement the tables or work-supports are caused to move upwardly at the front of the machine and then upwardly and rearwardly toward the back of the machine and then downwardly toward the front of the machine, as clearly shown in Fig. 3.

The tables or work-supports on their upward movement at the front of the machine have coöperating with them working tools, shown as bladed rolls or cylinders 10 12, located on opposite sides of the path of movement of the table, and the said tables or work-supports on their movement from the front to the rear of the machine also have coöperating with them a second set of operating-tools or bladed rolls 13 14, located on opposite sides of the path of movement of the tables.

The bladed rolls 10 12, which are located on the inner side of the path of movement of the tables, are for the best results made stationary with relation to the path of movement of the tables, and this result may be accomplished, as herein shown, by mounting the roll 10 in swing arms or levers 15, having extended through their lower end threaded rods 16, pivotally supported by studs 17, carried by brackets 18, attached to the side frames of the machine, the said threaded rods being engaged by nuts 19 20 on opposite sides of the swing-arms 15, so as to positively lock the said swing-arms and the roll against movement after the latter has been set or adjusted in operative position. The operating-tool 13 is rendered stationary in a similar manner by mounting the same in elbow-levers or swing-arms 22, having extended through them threaded rods 23, which are engaged by nuts 24 25 on opposite sides of the swing-arms 22 and which bear against studs or projections 26 on the framework.

The front or outer operating tools or rolls 12 14 are movable with relation to the stationary rolls 10 13, and for this purpose the roll 12 is mounted in swing-arms 30, having attached to their lower end angle-irons 31, to which are fastened one end of cords or flexible connections 32, which sustain weights 34, by means of which the pressure of the rolls upon the hide or skin may be regulated. The movement of the roll 12 toward the stationary roll 10 may be limited or arrested by means of a suitable stop, shown as a set-screw 131, adapted to engage a stationary portion of the machine.

The roll 14 of the upper set of rolls is mounted in levers 35, pivoted at 36 to the framework of the machine and having arms 37, upon which are mounted weights 38, the downward movement of the roll 14 being arrested by the set screw or bolt 39, carried by the levers 35 and engaging a stationary portion of the framework of the machine.

By making the inner roll of each set stationary with relation to the path of movement of the table and acting upon the outer roll by means of a weight a known pressure may be obtained, which pressure is constant and gives a more uniform action upon the hide or skin, consequently avoiding the chattering of the operating-rolls, which is liable to form marks on the hide or skin when both of the rolls are movable and held to their operative position either by springs or by foot-pressure.

The operating-rolls 10 12 act upon the portion of the hide or skin lying against the opposite sides of the table as the latter moves up in its vertical path at the front of the machine, and the operator is enabled to manipulate the hide or skin on the front side of the table, so as to avoid wrinkling of the skin and cutting of the same during its treatment or working out.

After the hide or skin has passed out of engagement with the operating-rolls 10 12 it is free to be moved or shifted on its table, so as to move that portion of the hide or skin lying over the edge of the table while the latter is undergoing treatment by the rolls 10 12 to engage one face, either the inner or the outer face of the table, and thereby present this untreated portion of the hide or skin to the second set of rolls 13 14 as the table passes from the front to the rear of the machine.

The second set of rolls 13 14, it will be observed, act on the untreated portion of the hide or skin while the latter lies against a flat side of the table, which is the most advantageous position for the hide or skin to be in while undergoing treatment by the operating tools or rolls, and at the same time the rolls 13 14 act on those portions of the hide or skin which have been previously treated by the rolls 10 12.

In some operations—as, for instance, in putting out—a hide or skin is partially dried by the first set of rolls 10 12 squeezing out the water therefrom, so that when the hide or skin is shifted on its table prior to its engagement with the second set of rolls 13 14 the portions of the hide or skin on opposite sides of the table are of unequal length, and when subjected to the action of the second set of rolls 13 14 the hide or skin is liable to be pulled off of the table by one of the rolls. To avoid this action on the part of the second set of rolls 13 14, I have provided means for resisting the drawing-off action of one of the rolls of the second set. In the present instance I have shown one construction of means for accomplishing this purpose; but I do not desire to limit my invention in this respect. To this end I have provided pads or bars 40 41, located on opposite sides of the rearward path of movement of the table and in the present instance beyond the same, said pads or bars being supported by spring-arms 42 43, suitably mounted on the tie-rods 36 45. The pads 40 41 and their spring-arms 42 43 constitute spring fingers or devices which act in the nature of a brake or resisting medium to hold the hide or skin on the table against movement over the edge thereof under the influence of either of the rolls 13 14.

Provision is made for supporting the portion of the hide or skin lying on the inner or under side of the table as the latter moves from the front to the rear of the machine, and to this end a stationary table or support 50 is attached to the framework of the machine. Provision is also made for insuring the tables being in alinement with their carriers, so as to be properly presented to the operating-rolls after changing from one portion of its endless path to another and, further, for governing the table so that it moves continuously in the same direction and is held in its movement from the downwardly-inclined path into the vertical path in such manner that the back side of the table is presented uppermost to the operator, while the table is moved from a substantially horizontal position into a substantially vertical position, with the result that the operator can throw or place one-half of the hide or skin on the back side of the table and smooth out the side and flanks resting on the back of the table, thereby placing this portion of the hide or skin in a most effective condition for subsequent action of the roll 10, and when the table assumes a vertical position the operator can smooth out the side and flanks on the front side of the table. In this manner the hide or skin on both the back and front surfaces of the table can be smoothed out by the hands of the operator and most effectively presented to the action of the operating-tools 10 12, with the least possible danger of

plaiting, cutting, or otherwise injuring the hide or skin. Furthermore, the tables may be arranged substantially near to one another on the endless carrier and yet obtain a substantially wide space or opening between the tables at the front of the machine for the operator to place the work on a table as it is moved from the inclined path into the vertical path, during which movement the front edge of the table travels in a substantially wide arc and passes from a downwardly-inclined position, through a substantially horizontal position, into a substantially vertical position.

The means for governing the table in the movements above described may be made as herein shown and consist of ribs or projections 52 on the opposite sides of the table at the rear of its pivot and lugs or ears 53, extended from one of the links, as 54, of the link-chains.

Each link 54 has extended from it two lugs or ears 53, which are separated from each other a distance greater than the thickness of the rib 52, with which they coöperate, as best shown in Figs. 6, 7, and 8, so as to allow of movement of the ribs as the table passes around the sprocket-wheels in the arc of a circle. In the movement of the link chains about the sprocket-wheels *e*, *f*, and *g* the chains assume substantially the form or an arc, and when this occurs the lugs 53 slide upon the ribs 52 toward the pivot for the table. (See Figs. 6 and 8.) After the chains have passed out of engagement with the sprocket-wheels they assume a substantially straight position, (see Fig. 7,) and the lugs 53 are moved rearwardly over the ribs 52 away from the pivot for the table. In moving from the vertical position into the inclined position the inner or lower lug is effective and carries the table, (see Fig. 6,) and the same is true when turning from the back toward the front, (see Fig. 8;) but when the table is turned from the downwardly-inclined position up into the vertical position what was before the upper lug becomes the effective lug. As the link chains move around the sprocket-wheel *g* the rib 52 engages the upper lug 53, which is due to the fact that the pivot for the table has been advanced around the sprocket-wheel sufficiently far to cause the rear portion of the table to rise upward, as represented in Fig. 8, and on the movement of the table in its downward path toward the front of the machine the table remains in engagement with the said upper lug, which at this time becomes the under lug. It will be seen that the lugs on the chains act on the ribs on the tables to cause them to follow the movement of the chains.

Provision is also made for supporting the table as it travels in its upwardly-inclined path from the front to the rear of the machine, and to this end supporting strips or bars 55 (see Fig. 3) are suitably secured to the side frames of the machine. The endless carrier and the operating-rolls may be rotated in any suitable manner, and in the present instance I have shown one form of driving mechanism for accomplishing this result. To this end the machine is provided with a main or driving shaft 60, (see Fig. 1,) which is journaled in the framework of the machine and in an auxiliary or side upright 61, the said shaft being provided with fast and loose pulleys 62 63 and with a gear 64, which meshes with a gear 65 on a counter-shaft 66. The endless carrier is driven from the main shaft 60 by means of a sprocket-wheel 70, link chain 71, sprocket wheel 72 on a shaft 73, supported by the upper portion of the framework, pinion 74 on the shaft 73, and a gear 75 on the shaft *j*.

The operating-rolls 10 12 are driven as follows: The roll 12 is provided with a sprocket-wheel 80, connected by the link chain 81 with a sprocket-wheel 82 on the counter-shaft 66, and the roll 10 is provided with a sprocket-wheel 84, connected by the link chain 85 with a sprocket-wheel 86 on the main shaft 60.

The upper set of rolls 13 14 are driven as follows: The roll 13 is provided with a sprocket-wheel 87, connected by a link chain 88 with a sprocket-wheel 89 on the shaft 73, and the roll 14 is provided with a sprocket-wheel 90, connected by a link chain 91 with a sprocket-wheel 92 on the counter-shaft 66. The link chains 85 91 may have coöperating with them suitable tightening-rolls 93 94.

In order to safeguard the operator at the front of the machine from being cut or injured by the roll 12 while he is reaching up above the said roll to shift the hide or skin on the upwardly-moving table, a hood or cover is 96 provided, which is secured to suitable brackets 97 on the swing-arms 30.

The operation of the machine may be briefly described as follows: The machine is set in operation in the usual manner, as by throwing a belt from the loose pulley 63 onto the fast pulley 64, and when it is set in operation the operator at the front of the machine places a hide or skin over the lowermost table when the latter is in a substantially horizontal position on its movement from the downwardly-inclined path upwardly into the vertical path and smooths out this portion of the hide or skin on the back of the table. The table, with the hide or skin thereon, on the movement of the endless carrier upwardly at the front of the machine is carried between the operating-rolls 10 12 and the portion of the hide or skin on opposite sides of the table are put out, unhaired, or otherwise treated, leaving that portion which lies on the upper edge of the table untreated. On the upward movement of the table the operator smooths

out the portions of the hide or skin on the front side of the table. After the table in its upward movement at the front of the machine has passed through the rolls 10 12 sufficiently to leave the hide or skin free the operator reaches up and moves or shifts the partially-treated hide or skin on its table, so as to bring the untreated portion of the hide or skin against either the front or rear surface or side of the table. The table is then moved upwardly from the front to the rear of the machine in an inclined path and passes between the second set of rolls 13 14, by which the previously-untreated portion of the hide or skin is worked out or treated, as well as the other portions of the hide or skin lying against the opposite surfaces of the table. The table continues on toward the rear of the machine, and when the machine is used for putting out an unskilled operator, as a boy, located at the rear of the machine takes the treated hide or skin from the table after the latter has passed through the second set of rolls 13 14 and at or about the time the table reaches the end of its rearward movement, after which the unloaded table moves downwardly in an inclined direction toward the front of the machine to again have a hide or skin placed thereon. In some operations—as, for instance, in unhairing hides or skins—the boy or unskilled operator at the rear of the machine may be dispensed with, owing to the fact that the hide or skin is in such wet condition as to enable it to be automatically discharged from the table by gravity, and it will therefore be seen that in the operation of unhairing with the machine herein shown a single operator located at the front of the machine could manipulate the hide or skin, so that the machine can treat the entire surface of the hide or skin and have the operating tools or rolls act on the entire surface of the hide or skin against the flat faces of the table, where the most effective working can be performed.

While I may prefer to make the inner rolls of each set stationary and have the outer roll of each set movable, so as to compensate for uneven thickness of the hides or skins, whereby the number of parts of the machine may be materially reduced in number, the cost of labor also reduced, and the chattering of the tools and defective work resulting therefrom avoided, I do not desire to limit myself in this respect, as fairly good results might be obtained with the inner set of rolls when made movable and spring-actuated.

I have also herein shown the invention as embodied in a serial-table machine in which a plurality of tables are connected with the endless carrier movable in the paths described, and while it is preferred to employ a plurality of tables it is not desired to limit the invention in this respect, as a single table may be employed.

I claim—

1. In a machine for treating hides, skins and leather, a table or work-support, an endless carrier to which said table or support is pivotally connected, said carrier being movable in a substantially triangular path having a substantially vertical portion at the front of the machine, an upwardly-inclined portion extended from the front toward the rear of the machine, and a downwardly-inclined portion extended from the rear toward the front of the machine, operating-tools at the front of the machine located on opposite sides of the vertical path of the table, operating-tools located at the upper portion of the machine on opposite sides of the upwardly-inclined path of the table, and means to move said carrier and its attached table, substantially as described.

2. In a machine for treating hides, skins and leather, a table or work-support, an endless carrier to which said table or support is pivotally connected, said carrier being movable in a substantially triangular path having a substantially vertical portion at the front of the machine, an upwardly-inclined portion extended from the front toward the rear of the machine, and a downwardly-inclined portion extended from the rear toward the front of the machine, operating-tools at the front of the machine located on opposite sides of the vertical path of the table, operating-tools located at the upper portion of the machine on opposite sides of the upwardly-inclined path of the table, means to render fixed or stationary the operating-tools located on the inner side of the path of movement of the table, and means to move said carrier and its attached table.

3. In a machine for treating hides, skins and leather, a table or work-support, an endless carrier to which said table or support is pivotally connected, said carrier being movable in a substantially triangular path having a substantially vertical portion at the front of the machine, an upwardly-inclined portion extended from the front toward the rear of the machine, and a downwardly-inclined portion extended from the rear toward the front of the machine, operating-tools at the front of the machine located on opposite sides of the vertical path of the table, operating-tools located at the upper portion of the machine on opposite sides of the upwardly-inclined path of the table, means located beyond the second set of operating-tools to engage the hide or skin on the table and resist movement of said hide or skin on the table under the influence of said second set of tools, and means to move said carrier and its attached table, substantially as described.

4. In a machine for treating hides, skins and leather, a table or work-support, an endless carrier to which said table or work-support is pivotally connected, said carrier being

movable in a substantially vertical path at the front of the machine and in an upwardly-inclined path from the front to the rear of the machine, whereby an operator at the front of the machine may shift the hide or skin on its table after it has been acted upon by one set of operating-tools and before being acted upon by a second set of tools, operating-tools at the front of the machine located on opposite sides of the vertical path of the table, operating-tools located at the upper portion of the machine on opposite sides of the upwardly-inclined path of the table, and means to move said carrier and its attached table, substantially as described.

5. In a machine for treating hides, skins and leather, a table or work-support, an endless carrier to which said table or support is pivotally connected intermediate of the ends of said table, said carrier being movable upwardly in a substantially vertical path at the front of the machine and downwardly in an inclined path toward said vertical path, and means on said endless carrier coöperating with means on said table to govern the table in its movement from said inclined path into said vertical path, whereby the front of the table projects beyond the path of movement of the endless carrier and is turned upward in the arc of a circle so that the back of the table is presented to the operator to permit the portion of the hide or skin placed on the back of the table to be smoothed out by the operator while said table is assuming a substantially vertical position, means to act on the hide or skin while on said table, and means to move said carrier and table, substantially as described.

6. In a machine for treating hides, skins and leather, a table or work-support, an endless carrier to which said table or work-support is pivotally connected, said carrier being movable in a substantially vertical path at the front of the machine and in an upwardly-inclined path from the front to the rear of the machine, whereby an operator at the front of the machine may shift the hide or skin on its table after it has been acted upon by one set of operating-tools and before being acted upon by a second set of tools, operating-tools at the front of the machine located on opposite sides of the vertical path of the table, operating-tools located at the upper portion of the machine on opposite sides of the upwardly-inclined path of the table, a holding device to engage the hide or skin and prevent its being drawn off of said table by one tool of said second set, and means to move said carrier and its table, substantially as described.

7. In a machine for treating hides, skins and leather, a table or work-support, an endless carrier to which said table or work-support is pivotally connected, said carrier being movable in a substantially vertical path at the front of the machine and in an upwardly-inclined path from the front to the rear of the machine, whereby an operator at the front of the machine may shift the hide or skin on its table after it has been acted upon by one set of operating-tools and before being acted upon by a second set of tools, operating-tools at the front of the machine located on opposite sides of the vertical path of the table, operating-tools located at the upper portion of the machine on opposite sides of the upwardly-inclined path of the table, yielding devices located on opposite sides of the rearwardly-inclined path of the table to engage the hide or skin while the latter is being acted upon by the second set of operating-tools, and means to move said carrier and its attached table.

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

GEORGE B. NORGRAVE.

Witnesses:
JAS. H. CHURCHILL,
J. MURPHY