

March 14, 1939.

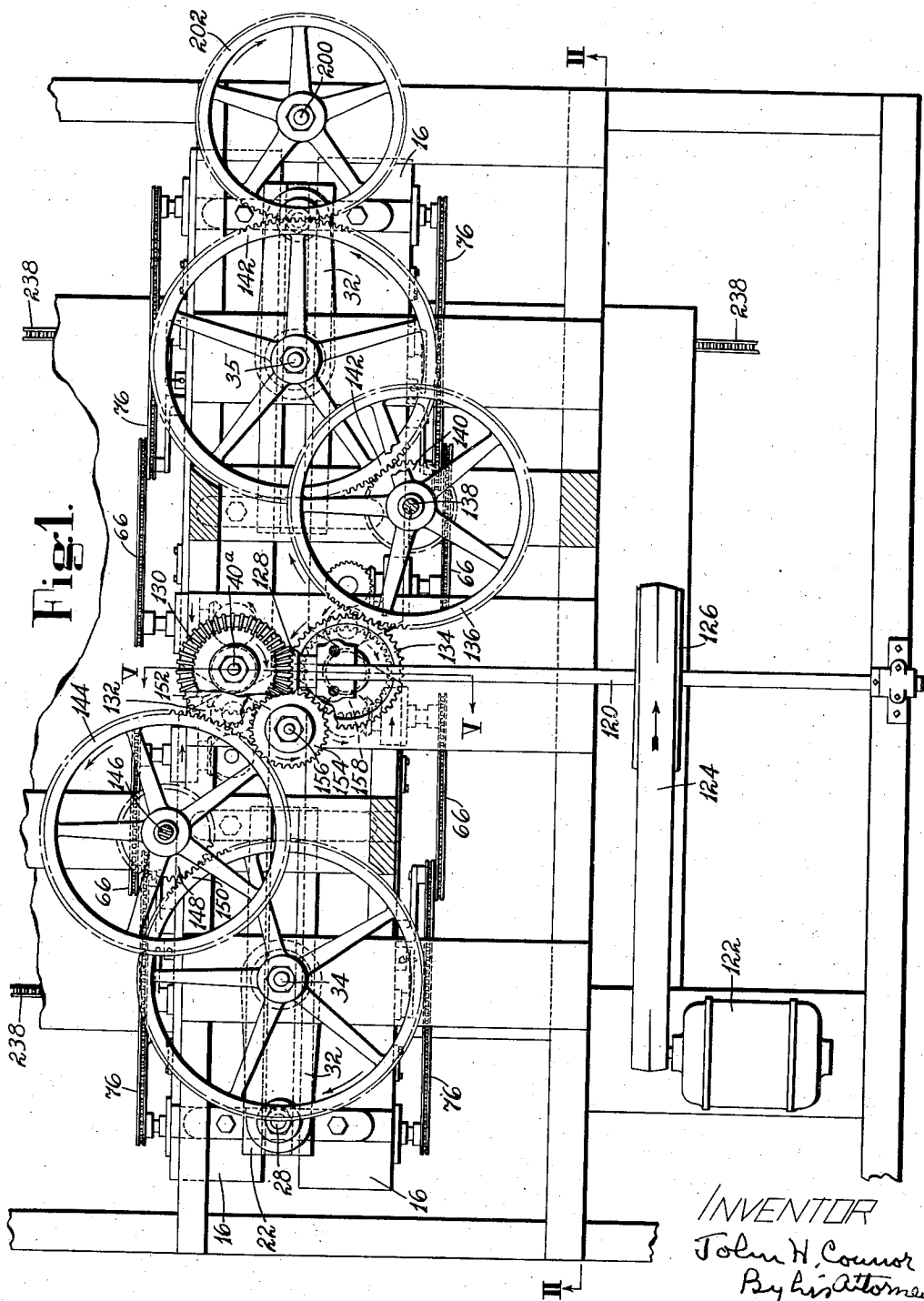
J. H. CONNOR

2,150,264

PUTTING-OUT MACHINE

Filed Jan. 13, 1937

5 Sheets-Sheet 1



March 14, 1939.

J. H. CONNOR

2,150,264

PUTTING-OUT MACHINE

Filed Jan. 13, 1937

5 Sheets-Sheet 2

Fig. 2.

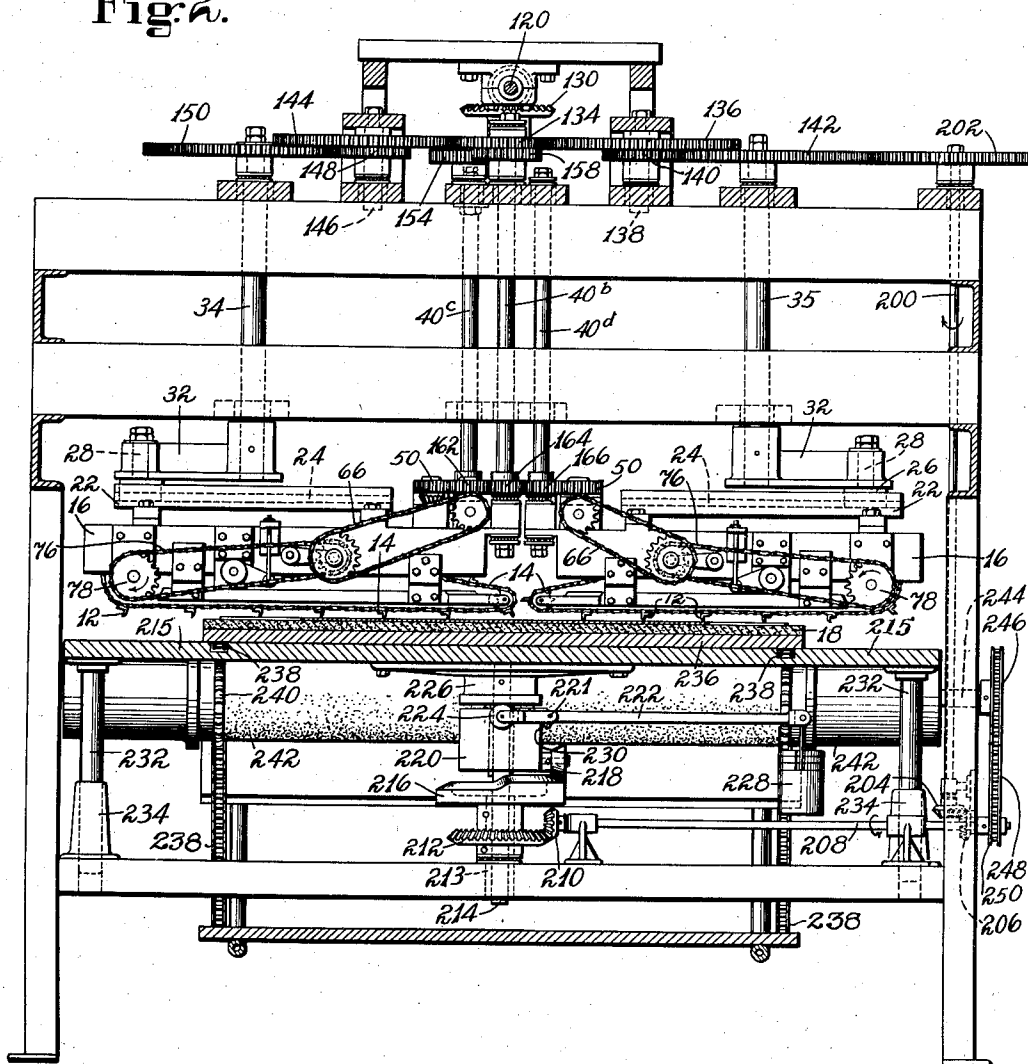
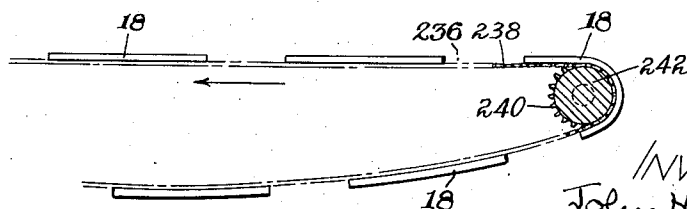


Fig. 10.

INVENTOR
John H. Connor
By his Attorney,
Harlow M. Davis

March 14, 1939.

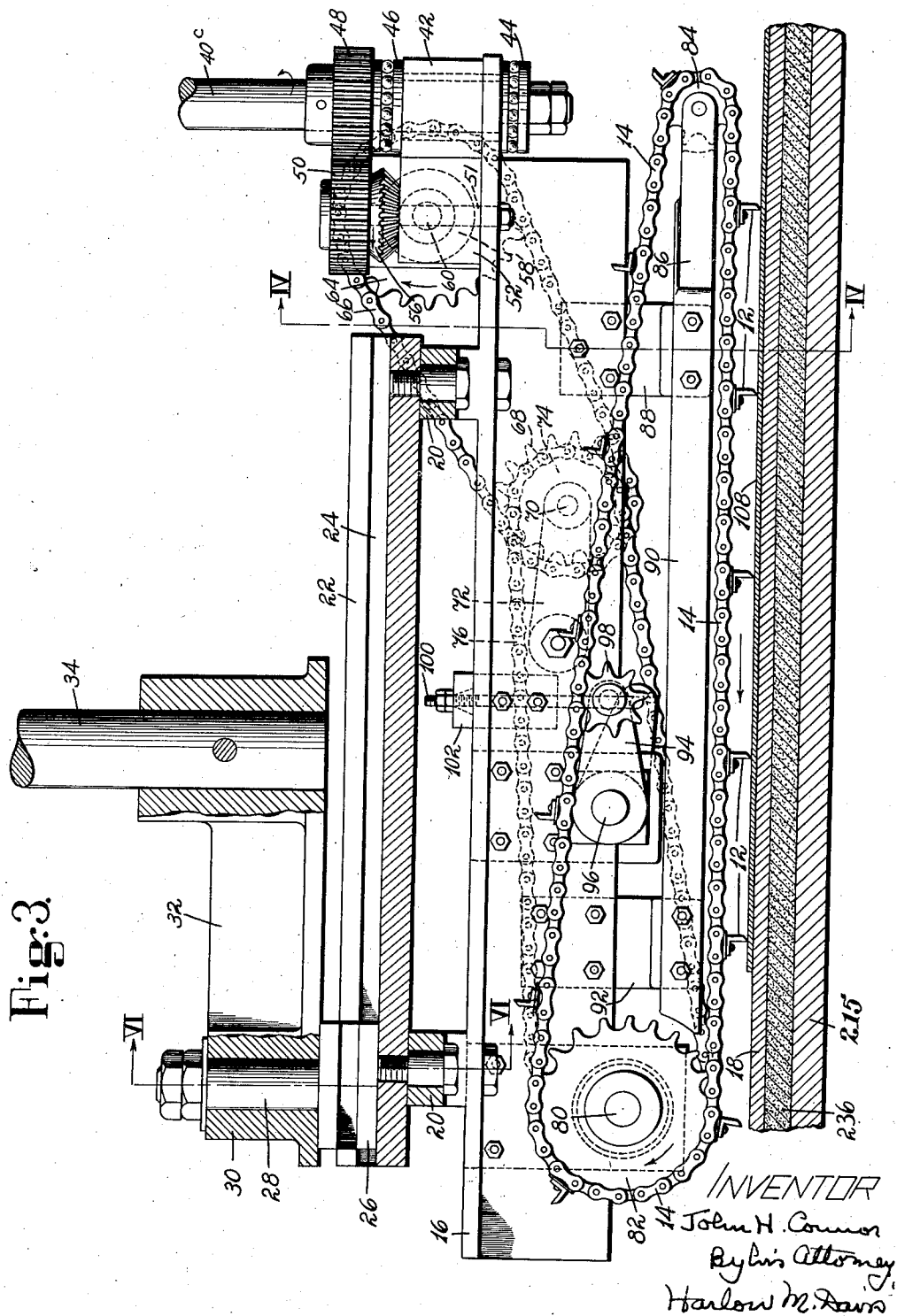
J. H. CONNOR

2,150,264

PUTTING-OUT MACHINE

Filed Jan. 13, 1937

5 Sheets-Sheet 3



March 14, 1939.

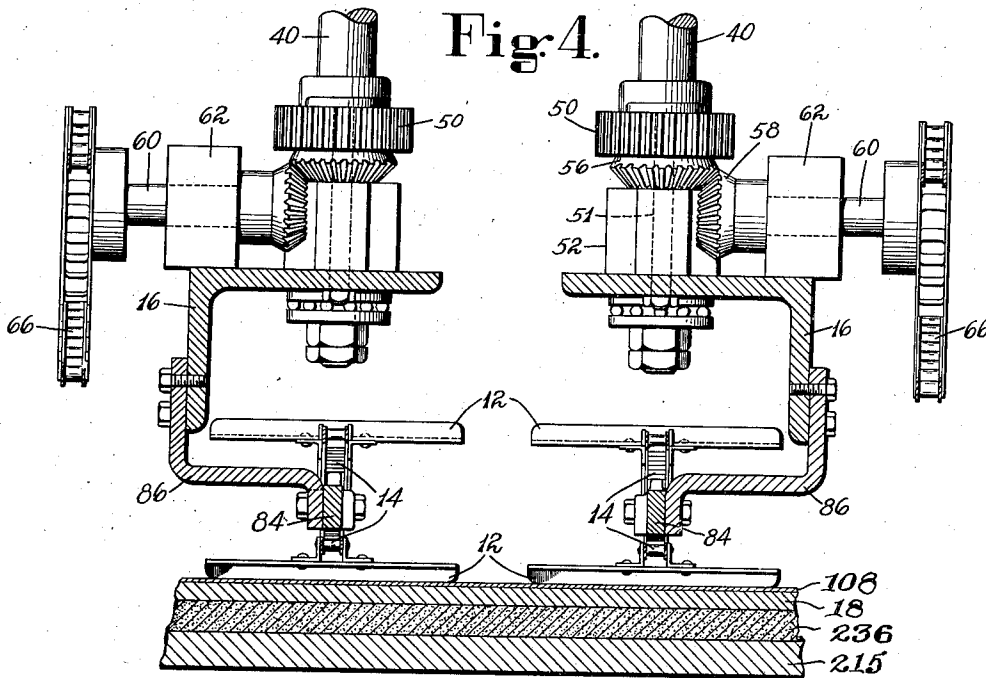
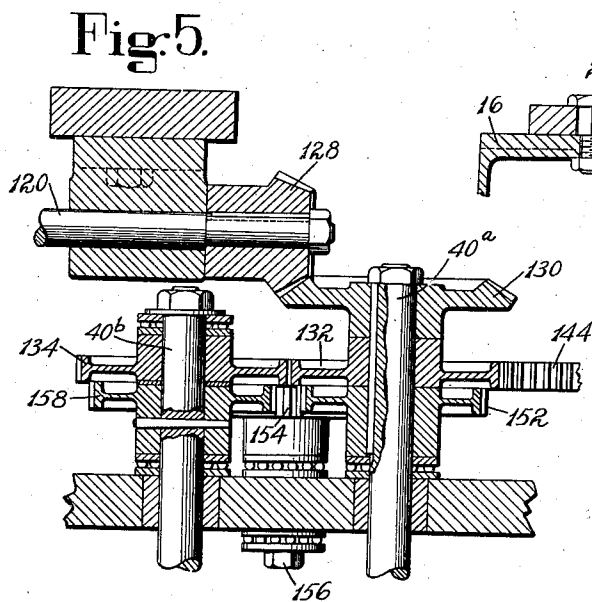
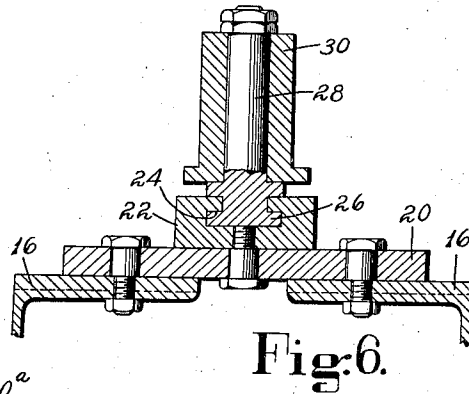
J. H. CONNOR

2,150,264

PUTTING-OUT MACHINE

Filed Jan. 13, 1937

5 Sheets-Sheet 4



INVENTOR
John H. Connor
By his Attorney
Harlow M. Darr

March 14, 1939.

J. H. CONNOR

2,150,264

PUTTING-OUT MACHINE

Filed Jan. 13, 1937

5 Sheets-Sheet 5

Fig. 7.

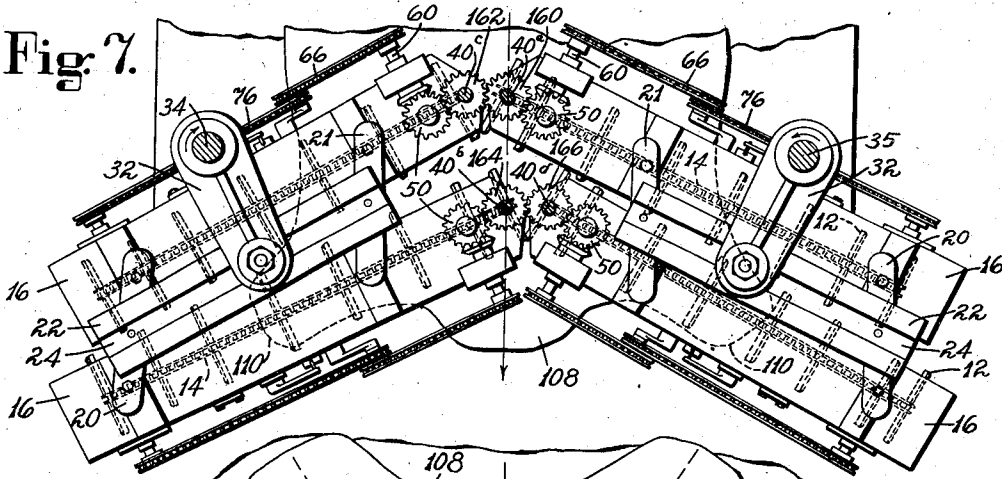


Fig. 8.

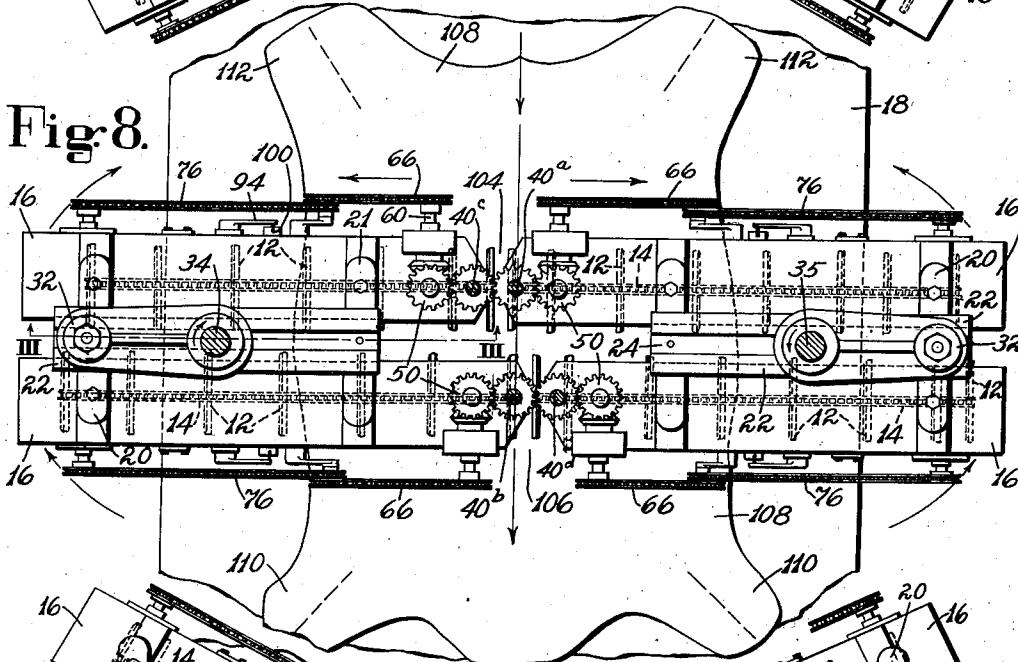
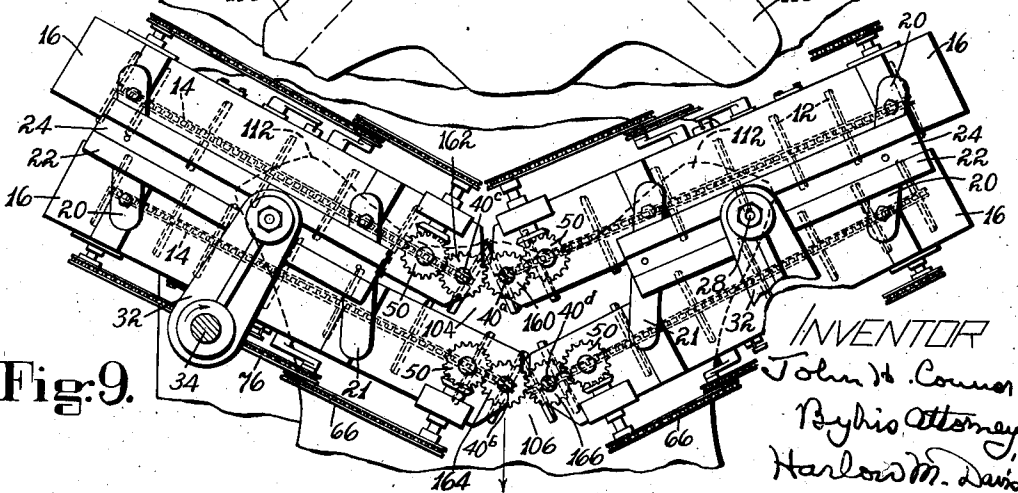


Fig. 9.



INVENTOR
John H. Connor
By his Attorney
Harlow M. Davis

UNITED STATES PATENT OFFICE

2,150,264

PUTTING-OUT MACHINE

John H. Connor, Newton, Mass., assignor to The
Tanning Process Company, Boston, Mass., a
corporation of Massachusetts

Application January 13, 1937, Serial No. 120,425

16 Claims. (Cl. 149—20)

This invention relates to machines for treating hides and skins. While the invention is illustrated as embodied in a machine for performing putting-out operations on freshly tanned hides and skins it is to be understood that the invention and various important features thereof may have other applications and uses.

It is an object of the invention to operate a tool, adapted for treating hides or skins, in such manner that the tool will travel in various directions over the surface of the hide or skin to suit the requirements of different portions thereof. It is a further object of the invention to operate a plurality of sets of tools simultaneously in substantially opposite directions over a hide or skin while treating certain portions thereof and to move these sets of tools at different angles to each other while treating other portions of the same hide or skin, whereby the hide or skin is treated by the tools while controlled in such manner as to secure the best results for the different portions of each hide or skin.

To these ends, and in accordance with an important feature of the invention, there are provided a plurality of sets of tools arranged to move along paths extending directly away from each other while operating upon an intermediate portion of the hide or skin, means being provided for moving the sets of tools into different angular relationships to each other during treatment of other portions of the hide or skin including, for example, front and rear shank portions thereof.

Conveniently, the sets of tools are mounted on members arranged to overlap each other at said inner ends so as to ensure treatment of all portions of a hide or skin in an organization wherein means is provided for swinging the tool carrying members about pivot points to change the angular relationship of the paths of sets of tools moving in opposite directions over certain portions of each hide or skin, whereby intermediate portions of each hide or skin may be treated while sets of tools are moving directly away from each other along lines at right angles to the backbone line of the hide or skin and whereby the front or rear shank portions of the same hide or skin will be treated by tools moving along lines related to the axes of said shank portions.

For presenting pieces of work to sets of tools arranged to move along different paths angularly related to each other, there is provided a conveyor movable over a table which is vertically projectable in timed relation to the conveyor moving means to press a piece of work on the conveyor against the tools during operative movement of the latter. Conveniently, the conveyor is provided with spaced work supports upon each of which a piece of work may be preliminarily spread out for treatment by such tools, means being provided for operation in timed relation to

the conveyor moving means and to the tool operating means to lift the table to the work treating plane to secure treatment of a work piece on one of the work supports and thereafter to lower the table to facilitate proper positioning of a fresh piece of work with respect to the sets of tools at the beginning of the operation upon such piece of work.

In the illustrated construction, the arrangement is such that a tool is mounted on a carrier pivotally supported at one end by a shaft which furnishes the source of power for driving the tool in an arrangement wherein the carrier is supported at its other end by a second shaft having connections to shift the carrier about its pivot point on the first-mentioned shaft, whereby the path of the tool over the surface of the hide or skin is changed to meet the requirements of different portions of the skin.

These and other important features of the invention and novel combinations of parts will now be described in detail and then pointed out more particularly in the appended claims.

In the drawings,

Fig. 1 is a top plan view of a putting-out machine illustrating one embodiment of the invention;

Fig. 2 is a vertical sectional view taken along the line II—II of Fig. 1 looking in the direction of the arrows;

Fig. 3 is an enlarged detail view of one tool carrier and its operating means taken along the line III—III of Fig. 8;

Fig. 4 is a sectional view taken along the line IV—IV of Fig. 3;

Fig. 5 is a sectional view along the line V—V of Fig. 1;

Fig. 6 is a sectional view along the line VI—VI of Fig. 3;

Figs. 7, 8 and 9 are top plan views of both tool carriers, showing them in different angular relationship to each other when operating upon different portions of a hide or skin; and

Fig. 10 is a diagrammatic view in side elevation and partly in section of an endless work supporting member.

In the illustrated machine, which is designed particularly for putting-out operations on hides and skins, there is provided a plurality of sets of tools in the form of slicker blades 12 (Figs. 2, 3 and 4) mounted in sets upon endless conveyor chains 14 in an arrangement wherein each chain is supported by a carrier 16 mounted in pairs (Figs. 7, 8 and 9) upon opposite sides of the longitudinal median line of a work support 18. It is to be understood that the tool carrying conveyor may be a belt or a chain of a type other than that illustrated. As shown most clearly in Figs. 7 to 9, inclusive, the two carriers 16 on the same side of the machine are connected together

near their outer ends by a link 20 pivoted at its ends to the carriers, the result being that the carriers 16 in each pair are maintained in parallel or nearly parallel relationship, although they may shift relatively to each other in a longitudinal direction, as indicated most clearly in Figs. 7 and 9. Associated with each pair of carriers near their inner ends is a second link 21 which is pivoted to one carrier and has its other end resting on the top of the other carrier and slidable thereover. If desired the link 21 may be secured at this slidable end by a pivot bolt which is movable along a suitable slot in the carrier 16. The reason for this arrangement resides in the fact that one carrier of each pair is longer than the other and hence the pivot points of the carriers are not symmetrically placed as they would be if the carriers were of the same length and always moved in parallelism. Pivoted to the parallel links 20 and 21 of each pair of carriers 16, at the centers of said links, is a cam slot member 22 having slidably engaged in a cam slot 24 (Figs. 3, 7, 8 and 9) thereof a cam slide member 26 (Figs. 3 and 6) T-shaped in cross section, as most clearly seen in Fig. 6 of the drawings. The cam slide member 26 is shown as part of the stub shaft 28 (Fig. 6) secured for rotation in a bearing 30 carried by an arm 32 (Fig. 3) pinned to the lower end of a driven shaft 34 (Figs. 2 and 3). This shaft 34 not only supports one end (Fig. 2) of the pair of carriers 16 (to the left in Figs. 7, 8 and 9) but also rotates in a clockwise direction and constitutes part of the means for moving the two sets of carriers into different angular relationships to each other, as will hereinafter be described. The right pair of carriers (Figs. 7, 8 and 9) is supported and operated by a shaft 35 which rotates in a counterclockwise direction.

Journalled in the inner end of each carrier 16 is a vertically arranged shaft 40c (Figs. 2, 3, 7, 8 and 9), or one of the other similar shafts 40a, 40b, 40d, the said inner end of the carrier 16 being provided with a bearing 42 in which the shaft 40c (Fig. 3) is journalled, said shaft being provided with thrust bearings at 44 and 46. The shaft 40c is thus constructed to serve as a support for the inner end of its associated carrier 16, the thrust bearing 44 taking a substantial part of the weight of the carrier 16 together with the parts supported by said carrier, while the thrust bearing 46 serves as a backing member for the adjacent end of the carrier 16 when the work is pressed upwardly against the slicker blades 12 during operation of the machine. The shaft 40c also serves as a source of power for driving the endless tool carrying chain 14 on its associated carrier 16. For this purpose the shaft 40c is provided with a pinion 48 (Figs. 2 and 3) in mesh with a pinion 50 (Figs. 2, 3 and 4) on a stub shaft 51 mounted parallel to the shaft 40c in a bearing block 52. Carried by the shaft 51 of the pinion 50 is a miter gear 56 which is constantly in mesh with another miter gear 58 (Fig. 4) secured to a short shaft 60 mounted in a bearing 62 carried by the carrier 16. On the outer end of the shaft 60 is a sprocket wheel 64 (Fig. 3) about which passes a sprocket chain 66 arranged to pass also around a sprocket 68 on a stub shaft 70 carried by a bracket 72 attached to a vertical wall portion of the carrier 16. As shown most clearly in Figs. 2, 3 and 7 to 9 inclusive, the shaft 70 is provided with a second sprocket wheel 74 about which passes a sprocket chain 76 which also passes around a sprocket wheel 78 (Fig. 2)

to drive a shaft 80 journalled in a bracket carried by the vertical wall of the carrier 16. Upon the other end of the shaft 80 there is secured a sprocket wheel 82 (Fig. 3) about which passes the tool carrying chain 14 to which are secured the slicker blades 12. The chain 14 also passes around a sprocket wheel 84 carried at the end of a bracket 86 secured to a vertical bracket 88 fixed to the vertical wall of the carrier 16. This sprocket wheel 84 is made as small as is practical in order that the space between the slicker blades at the middle line of the machine may be as small as possible. For backing the operative run of the chain 14 along the lower side of the carrier 16, there is provided a bar 90 supported at one end by the bracket 88 and at its other end by a similar bracket 92. Secured rotatably in an arm 94 pivotally mounted at 96 in the carrier 16 is an idler sprocket 98 in engagement with the upper run of the conveyor chain 14 which carries the slicker blades 12, a rod 100 being pivotally connected to the outer end of the arm 94 and being adjustably mounted in a bracket 102 secured to the carrier 16 so that adjustment may be made in an upward direction of the idler sprocket 98 to tension to the desired degree the chain or link belt 14.

As indicated most clearly in Fig. 8 of the drawings, the space 104 between the inner ends of one pair of tool carrying chains 14 is staggered with respect to the space 106 between the inner ends of the other pair of chains 14, so that, as the skin 108 travels along in the direction of the arrows, no untreated portion will be left adjacent to the backbone line of the skin, as would be the case if the space between the inner ends of one pair of chains were in line with the space between the other pair of chains or link belts. In this connection, it will be readily understood that the chains or link belts 14 to the right of the median line of the skin 108 in Fig. 8 are so driven that their lower or operative runs are moving toward the right while the operative runs of the chains 14 to the left of said median line of the skin are moving toward the left, whereby the two sets of slicker blades 12 to the right are moving away from the sets of slicker blades to the left in said figure. Hence the blades not only remove watery material from the skin being operated upon but also stretch the contacted portions of the skin in opposite directions from the backbone line thereof as the blades 12 pass successively over the surface of the skin during movement of the latter continuously in a plane which is substantially the plane of the operative edges of the blades.

Upon inspection of Fig. 8, it will be observed that the front shank portions 110, at the neck end of the skin 108, extend along axes at a substantial acute angle to the backbone line of the skin and that the rear shank members 112 of the skin 108 also extend along axes at another acute angle to the backbone line of the skin. In order to operate upon these shank portions of the skin effectively and, at the same time, to obviate as much as possible the tendency to turn over the edges of these shank portions and/or to displace them from their natural relationship to the rest of the skin, I have provided means for moving the pairs of tool carriers 16, on opposite sides of the median line of the work support, into different angular relationships to each other in accordance with the portion of the hide or skin to be treated. While the middle or intermediate portions of the skin 108 are being treated, the

described pairs of carriers 16 extend more or less in line with each other upon opposite sides of the backbone line of the skin, as most clearly shown in Fig. 8. This alinement of the two pairs of blade-carrying chains lasts for only an instant. There is a gradual shifting to the angle shown in Fig. 9. As the skin 108 is moved along by the table 18 in the direction of the arrows on the backbone line of the skin, the angular relationship of the two tool carriers 16 at the left in the same figure is changed with respect to the tool carriers at the right so that, by the time the rear shank portions 112 are under the action of the blades 12, the angular relationship of the two sets of carriers is that shown in Fig. 9. It will be noted that the blades 12 over the shank portions 112 in Fig. 9 are not traveling along paths parallel to the axes of said shank portions indicated by dotted lines in Fig. 8. If the blades were to move only along the axes of the shank portions 112 there would be no stretching of these shank portions in directions away from the individual axis of each shank but only in a direction along the axis. In the latter case the shank members would be lengthened along each axis but would be correspondingly narrowed or drawn in, instead of being spread out. With the blades located as shown in Fig. 9, their action is to spread the shank portions 112 as well as to lengthen the latter, the result being a spreading out of the shank pieces to the full extent that it is practical to obtain in a machine of this type. In the interval between the action on the rear end shank members 112 of the hide or skin 108 and the time of action on the front shanks 110 of a succeeding skin, the two pairs of tool carriers 16 are shifted with relative rapidity from the angle shown in Fig. 9 to that shown in Fig. 7, the result being that, as the second skin 108 approaches the sets of slicker blades, the front shank portions 110 of the skin 108 are operated upon with the sets of blades in the angular relation to each other shown in Fig. 7. In this figure the blades 12 appear to be moving in a direction almost parallel to the axes of said shank portions 110. It is to be remembered, however, that the relationship between the blades 12 and the shank portions 110 in Fig. 7 is maintained for an instant only, since the skin 108 is traveling continuously in the direction of the arrow at its median line. A good part of the time the blades are traveling at an angle to the axis of the shank portions 110 so that these shank portions are stretched laterally of their axial lines as well as along such lines.

It is to be noted that the space 104 between two of the sets of blades extending crosswise of the skin 108 and the space 106 between the other two sets of blades are upon opposite sides of the longitudinal median line of the machine and that these spaces are each roughly rectangular in shape in Fig. 8, and that these same spaces 104, 106 are substantially triangular in shape in Figs. 7 and 9, due to the shifting of the pairs of carriers 16 into different angular relationships. Nevertheless these spaces 104, 106, notwithstanding their changes in shape, are still staggered with respect to each other, so much so that they are substantially on opposite sides of the longitudinal median line of the skin, thus insuring that all portions of the work piece will be treated while the skin is passing from one end to the other under the sets of blades.

In explanation of the statement above, that the right and left sets of carriers are moved

with relative rapidity from the angular relationship shown in Fig. 9 to that of Fig. 7, it is pointed out that the operating shaft 34 (Figs. 7, 8 and 9) is rotated in a clockwise direction and hence that the arc through which the slide member 26 (in the end of the arm 32) is moved to get from the position of Fig. 9 to the position of Fig. 7, is very much less than the arc through which this same slide member 26 moves in traveling from the position of Fig. 7 to that of Fig. 8 and on to that of Fig. 9. The same facts apply to the movements of the shaft 35 which differs from the shaft 34 only in turning in a counterclockwise direction. Hence, the movement of the tool carriers from the position of Fig. 7 through that of Fig. 8 to that of Fig. 9 is much slower than the movement of the same carriers from Fig. 9 to Fig. 7. In other words, the movement from the position of Fig. 9 to that of Fig. 7 is much faster, about twice as fast, although the rate of rotation of the shafts 34 and 35 is uniform throughout.

For driving the shafts 34, 35 and 40a, there is provided a power shaft 120 (Figs. 1 and 5) at the top of the machine arranged to be driven by any suitable means, for instance by a motor 122 through a belt 124, and a pulley 126 fixed on the shaft 120. At one end, the shaft 120 has secured thereto a miter gear 128 which is constantly in mesh with a miter gear 130 keyed to the upper end of the shaft 40a. Splined to the shaft 40a is a pinion 132 in mesh with a pinion 134 loose upon the upper end of another long vertical shaft 40b which is directly in front of the shaft 40a mentioned above. This pinion 134 is in mesh with a large gear wheel 136 (Figs. 1 and 2) at the upper end of a stub shaft 138 which carries also a pinion 140 in mesh with a large gear wheel 142 secured to the upper end of the shaft 35 to drive the latter in a counterclockwise direction. The pinion 132 (Fig. 5) splined on the shaft 40a (Figs. 1 and 5) is also in mesh with a large gear wheel 144 carried by a stub shaft 146 which also carries a pinion 148 in mesh with a large gear 150 secured to the upper end of the shaft 34 to drive the latter in a clockwise direction. The shaft 40a also has splined thereto a pinion 152 (Fig. 5) in mesh with a pinion 154 at the upper end of a stub shaft 156. Said pinion 154 is in mesh with a pinion 158 keyed to the shaft 40b which is directly in front of the rearmost long vertical shaft 40a of Figs. 1 and 5. Through this intermediate pinion 154 the shaft 40b is driven in the same direction as the first-mentioned rearmost shaft 40a.

Upon reference to Figs. 7, 8 and 9 it will be observed that the shaft 40a has fixed thereto at its lower end a pinion 160 which is constantly in mesh with a pinion 162 fixed to the lower end of the vertical shaft 40c whereby the shaft 40c is driven by the shaft 40a and in the reverse direction with respect to the latter. At the lower end of the vertical shaft 40b there is secured thereto a pinion 164 arranged to be constantly in mesh with a pinion 166 keyed to the shaft 40d to drive the latter in the reverse direction from the shaft 40b. It will be noted, upon inspection of Figs. 7, 8 and 9, that the pairs of pinions 160, 162 and the pairs of pinions 164, 166 remain in mesh with each other at all times irrespective of the fact that the carriers 16 supported by the shafts 40a, 40b, 40c, 40d change their angular relationship to each other very substantially, as indicated in said figures.

Mounted at the right side of the machine in Figs. 1 and 2 is a vertical shaft 200 having fixed

to its upper end a gear wheel 202 in mesh with the gear wheel 142 to be driven thereby. At its lower end the shaft 200 is provided with a miter gear 204 (Fig. 2) in mesh with a miter gear 206 fixed upon a horizontal shaft 208 mounted in suitable bearings in the frame of the machine. On the other end of the shaft 208 is a miter gear 210 in mesh with a larger miter gear 212 secured to a sleeve 213 rotatable on a vertical shaft 214 which is positioned at the center of gravity of a table 215 and is rigidly attached to the latter. Hence the shaft 214 will move up and down with the table but is fixed against rotation. Also secured to the rotary sleeve 213 at its upper end is a cam member 216 having high and low parts upon which runs a cam roll 218 rotatably mounted on a block 220 splined to the shaft 214 for vertical movement on the latter. It will be apparent that, during rotation of the sleeve 213 and of the cam member 216, the block 220 will be alternately lifted and lowered at predetermined intervals. Pivoted on the block 220 at 221 is a lever 222 carrying at its inner end a roll 224 held continuously against a block 226 (fastened to the shaft 214) by a weight 228 which may be increased or diminished as may be found desirable. Movement of the lever 222 in one direction is limited by projection 230 rigid with the lever. Upward movement of block 220 is transmitted to the table 215 yieldingly through lever 222. The timing is such that the table 215 is lifted to press one of the work supports 18 against the blades 12 of the four bladed chains 14. For guiding the table 215 for direct up and down movement there are provided a plurality of posts 232 secured to the table and slidable in hollow standards 234 secured to the machine frame, as clearly shown in Fig. 2.

Conveniently, and as indicated in Fig. 10, there are a plurality of flexible work supports 18 carried by an endless conveyor belt 236 comprising sprocket chains 238 in mesh with sprocket teeth 240 (Fig. 2) on large rolls 242. For driving one of the rolls 242, an extension of its shaft 244, which is mounted in bearings in the frame of the machine, has secured thereto a large sprocket wheel 246 about which passes a sprocket chain 248 also passing about a smaller sprocket wheel 250 pinned on the shaft 200. It follows that the work supports 18 on the endless belt 236 are moved along in properly timed relation to the upward movement of the table 215 and to the operation of the bladed chains 14 which are driven, as above described, through mechanism interconnected with the shaft 200 which constitutes driving mechanism for the conveyor 236 and for the operating mechanism of the table 215. It will be understood that, in place of the flexible work supports 18 (Figs. 2 and 10), there may be utilized separate, relatively inflexible work supports arranged to travel along with the endless conveyor 236, in which case the work pieces and work supports are removed together after treatment of the work piece by the blades 12. In operating the machine disclosed in the drawings, a hide or skin is placed upon one of the work supports 18 while the conveyor belt 236 is moving in a direction to carry said work support under the sets of work treating blades 12, a reasonable amount of care being taken to spread the hide or skin out with the hands, not with the idea of extending the hide or skin in such a way as to stretch it out but simply to place it in condition to be operated on properly by the different sets of blades 12. It will be understood that

the hide or skin is carried under the sets of blades 12 while the table 215 is in depressed position and that the table is lifted to press a piece of work on a work support 18 against the blades 12 when the forward part of the work support has brought the neck and front shank portions of the hide or skin under the blade carriers, as indicated in Fig. 7. As the skin travels along with the work support 18, the blades, moving outwardly in sets in opposite directions from the median line of the work support, put out watery material from the hide or skin and also stretch it in opposite directions from the backbone line thereof, the angular relationship of the sets of blades at the beginning of the operation being such as to treat most advantageously the forward neck portions of the skin and also the front shank portions thereof. As the skin continues to travel in the direction of the arrows (Figs. 7, 8, 9), the blade carriers 16 gradually change their angular relationship until they are in direct line with each other when the middle portions of the hide or skin are reached. In this position of the blade carriers, the blades operate along paths leading directly away from each other so that these intermediate portions are stretched directly away from the backbone line of the hide or skin or at a relatively small angle thereto. This relative movement of the blade carriers continues so that, by the time the rear shank portions are under the blades, the latter are arranged in such manner that they travel in sets at quite an acute angle to the backbone line to operate most effectively on the rear shank portions of the hide or skin, as indicated in Fig. 9. As the hide or skin on its work support 18 passes away from the bladed belts, the work table 215 is lowered, thus making it possible for a hide or skin on a succeeding work support 18 to come into proper position beneath the plane of the operative edges of the blades 12. During this interval between one work support 18 and a succeeding work support on the endless conveyor 236, the blade carriers 16 are shifted rapidly from the angular relationship shown in Fig. 9 to nearly that shown in Fig. 7. Hence the spaces between the work supports 18 on the endless conveyor 236 are shorter than the lengths of the work supports 18. Accordingly there is little delay in presenting one work piece after another for treatment by the sets of blades. As fast as a work piece is treated, it is removed from its traveling work support 18 and either receives other treatment or is hung up to dry.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a machine for treating hides and skins, each having front and rear shank portions extending at an angle to the backbone line of the hide or skin, a support on which a skin is to be spread out in extended condition, a plurality of sets of tools, carriers for the sets of tools, means for moving each set of tools along that surface of its carrier which faces the work support and simultaneously with another set of tools along paths extending in directly opposite directions while treating intermediate portions of a hide or skin, and means for moving the tool carriers with respect to each other to change the paths of the sets of tools so that certain sets of the tools operate in the general directions of the axes of one pair of shank portions and along paths at an angle of less than 180° to each such shank while treating other portions of the same hide or skin.

2. In a machine for treating hides and skins, each having front and rear shank portions extending at an angle to the backbone line of the hide or skin, a support on which a skin is to be spread out flat in extended condition with the rear shanks diverging from the front shanks, a plurality of sets of tools for treating the hide or skin, carriers for the sets of tools, means to move each set of tools along that surface of its carrier which faces the work support, and means to move the carriers to position them in line with each other on opposite sides of the backbone line of the hide or skin and to shift the carriers into an angular relationship to each other so that the tools move along paths in the general direction of the axes of the front shank portions of the hide or skin and subsequently at a different angle to move along paths in the general direction of the axes of the rear shank portions of the same hide or skin.

3. In a machine for treating hides and skins, each having front and rear shank portions extending at an angle to the backbone line of the hide or skin, a plurality of sets of tools for treating the hide or skin, conveyor chains arranged to carry and to operate the tools, the chains being arranged in pairs on opposite sides of the center line of the machine, and two of such oppositely disposed chains having their inner ends overlapping so as to leave no portion of the hide or skin untreated, and means for moving the chains to position the latter in line with each other upon opposite sides of the backbone line of the hide or skin to treat intermediate portions of a hide or skin and, alternatively, at an angle to each other whereby the chains and the tools carried thereby are caused to operate along lines related to the axes of the front and of the rear shank portions of the hide or skin.

4. In a machine for operating upon hides, skins and leather, a work support upon which a piece of work may be placed with the longitudinal median line thereof arranged close to and parallel with the longitudinal median line of the work support, members having tools for operating on a piece of work while it is backed by said work support, means to cause the tools to move from the longitudinal median line of the piece of work in opposite directions along lines substantially at right angles to said longitudinal median line, said work support and said tool-carrying members being relatively movable bodily in the direction of the longitudinal median line of the piece of work, and means to move the tool carrying members to change the angular relation of the path of said tools with respect to said longitudinal median line during said relative bodily movement of the tool carrying members and work support.

5. In a machine for operating upon hides, skins and leather, a work support upon which a piece of work may be placed with the longitudinal median line thereof arranged close to and parallel with the longitudinal median line of the work support, one or more pairs of members having tools movable to operate upon a piece of work while the latter is backed by said work support, means to move the work support and the piece of work thereon past said tool-carrying members during operation of the tools on the work piece, means to cause the tools of one or more pairs of said members to move along the surface of the piece of work in opposite directions from other tools and away from the longitudinal median axis of the piece of work and substantially at right angles to said axis, and means operating in timed

relation to said movement of the work support past the tools to change the angular relationship of the paths made by the tools on the work with respect to said longitudinal median axis of the work piece.

6. In a machine for treating hides and skins, each having front and rear shank portions extending at an angle to the backbone line of the hide or skin, a plurality of sets of tools for treating the hide or skin, carriers for the sets of tools, endless conveyor chains mounted on the carriers and arranged to carry and operate the tools, the chains being arranged in pairs on opposite sides of the center line of the machine, and the space between inner adjacent ends of two oppositely moving chains being staggered with respect to the space between the inner ends of two other oppositely moving chains, and means for moving the carriers to position the latter in line with each other upon opposite sides of the backbone line of the hide or skin and alternatively at an angle of less than 180° to each other, whereby the chains and the tools carried thereby are caused to move along paths at right angles to the backbone line of the hide or skin and also along paths related to the axis of the front and also of the rear shank portions of the hide or skin.

7. In a machine for operating upon hides, skins and leather, a traveling conveyor adapted to support a hide or skin roughly spread out thereon with its backbone line lying parallel to and closely adjacent to the longitudinal median line of the traveling conveyor, two pairs of tool carrying chains arranged to operate upon the work piece on the traveling conveyor during continuous movement of the latter, said chains having operative runs extending substantially in parallelism with each other, and certain of said chains having their inner ends overlapping substantially at said longitudinal median line of the traveling conveyor, means pivotally supporting said tool carrying chains to turn about axes perpendicular to said operative runs of the chains, and power means operated in timed relation to the movement of the traveling conveyor to shift the tool carrying chains about said axes so as to change the angular relationship of the operative runs of the chains with respect to each other and with respect to the longitudinal median line of the traveling conveyor.

8. In a machine for treating hides and skins, each having front and rear shank portions extending at an angle to the backbone line of the hide or skin, a plurality of sets of tools, carriers for the tools, a cam slide member secured to each carrier, means for pivotally mounting the carriers at their inner adjacent ends, and crank members one for each cam slide and having a part slidably mounted in the cam slide member to support and to move the carriers about their inner pivotal supports into different angular relationships to each other, whereby the sets of tools may be caused to move along lines leading directly away from each other and alternatively along lines at an angle to each other related to the angles made by the axes of the front and also of the rear shank portions with the backbone line of the hide or skin.

9. In a machine for putting-out hides and skins each having front and rear shank portions extending at an angle to the backbone line of the hide or skin, a plurality of sets of slicker blades, carriers for the blades, a work support movable to carry the hide or skin with the backbone line thereof centrally placed and extending parallel to the direction of movement of the work sup-

port, means to operate the blades in sets along paths extending directly away from each other while putting-out intermediate portions of each hide or skin, means to move the carriers at angles to each other related to the angles made by the axes of the front and rear shank portions of the hide or skin to the backbone line thereof, and means operated in timed relation to the moving means for the carriers to move the work support to present a hide or skin thereon to said sets of blades, whereby the carriers and blades will occupy successively different angular relationships necessary to put out effectively the intermediate and the shank portions of each hide or skin.

10. In a machine for putting-out hides and skins, each having front and rear shank portions extending at an angle to the backbone line of the hide or skin, a plurality of sets of slicker blades, carriers for the blades, a work support movable to carry the hide or skin with the backbone line thereof centrally placed and extending parallel to the direction of movement of the work support, means to operate the blades in sets along paths extending directly away from each other while treating intermediate portions of each hide or skin, means to move the carriers at an angle to each other related to the axes of the front and rear shank portions of the hide or skin, means operated in timed relation to the moving means for the carriers to move the work support along in a plane below the operative edges of the blades whereby the carriers and blades will occupy successively the different angular relationships necessary to treat the intermediate and the shank portions of each hide or skin, a table over which the work support is movable to present the hide or skin to the sets of blades, and means operated in timed relation to the work support moving means to raise the table to press the hide or skin against the sets of blades during the operation of the latter on a given hide or skin.

11. In a machine for operating upon hides and skins, a plurality of sets of tools, means for supporting and operating said sets of tools along different angularly related paths to treat suitably different portions of a work piece, a conveyor adapted to support pieces of work for successive presentation to the sets of tools, a table over which the conveyor moves during treatment of a work piece by said tools, means moving the conveyor during the work treating operation, and means operating in timed relation to the conveyor moving means to lift the table to press the work piece on the moving conveyor against the tools during movement of the latter in a work-treating operation.

12. In a machine for putting out hides and skins, a plurality of sets of blades, a plurality of blade-carrying chains arranged in pairs and extending in opposite directions while operating upon an intermediate portion of a work piece, means to shift the bladed chains into different angular relationships to each other while treating other portions of the work piece, a conveyor for presenting successive pieces of work to the sets of blades, a table over which the conveyor moves, means for moving the conveyor continuously to carry the work pieces into position for treatment by the blades and also during treatment by the blades, said conveyor moving means operating in timed relation to the means for angularly shift-

ing the bladed chains into different angular relationships, and means operating in timed relation to the conveyor moving means and to the chain shifting means for alternately lifting and depressing the table to effect presentation of the work piece to the tools and subsequently to permit positioning of a fresh work piece in place for treatment by the tools while the latter are in a predetermined angular relationship to each other for treatment of the entering portion of such work piece.

13. In a machine for putting-out hides and skins, a plurality of sets of blades, a plurality of blade-carrying chains arranged in pairs and extending in opposite directions while operating upon an intermediate portion of a work piece, means to move the bladed chains into different angular relationships to each other while treating other portions of the work piece, a conveyor for presenting successive pieces of work to the sets of blades, a table over which the conveyor moves, means for moving the conveyor continuously to carry the work pieces into position for treatment by the blades and also during treatment by the blades, and means operating in timed relation to the conveyor moving means to lift the table to press the work piece against the blades during operative movements of the latter.

14. In a machine for operating on hides or skins, a tool, a carrier for the tool, means mounted on the carrier for operating the tool while the latter is in contact with the hide or skin, a vertical shaft arranged to support pivotally one end of the carrier, said shaft being driven and having connections to drive the tool operating means, and a second vertical driven shaft mounted in the frame of the machine independently of the first-mentioned shaft and having connections to move said carrier about its pivot point on the first-mentioned shaft, whereby the path of movement of the tool over the hide and skin may be varied to suit the requirements of different portions of the hide or skin.

15. In a machine for operating on hides and skins, a tool, a carrier for the tool, means mounted on the carrier for operating the tool while the latter is in contact with the hide or skin, a vertical shaft arranged to provide a pivotal support for one end of the carrier, said shaft having connections to drive the tool operating means, a cam slot member secured to said carrier, and a second shaft parallel to the first-mentioned shaft and having a cam slide connection with said cam slot member to move the carrier about the pivot point furnished by the first-mentioned shaft, whereby the tool is caused to move along different paths to suit requirements of different portions of the hide or skin.

16. In a machine for treating hides and skins, a tool movable over the surface of the hide or skin to treat the latter, a work support movable to present successive portions of the hide or skin to the tool, a table over which the work support moves, means moving the work support along on said table during treatment of the hide or skin by said tool, and means operated in timed relation to the work support moving means to lift the table to press the hide or skin on the moving work support against the tool during operations of the latter on the hide or skin.

JOHN H. CONNOR..