(No Model.) 4 Sheets—Sheet 1.

W. B. TURNER.

MACHINE FOR TREATING HIDES AND LEATHER.

No. 584,123. Patented June 8, 1897.

Fig. 1.

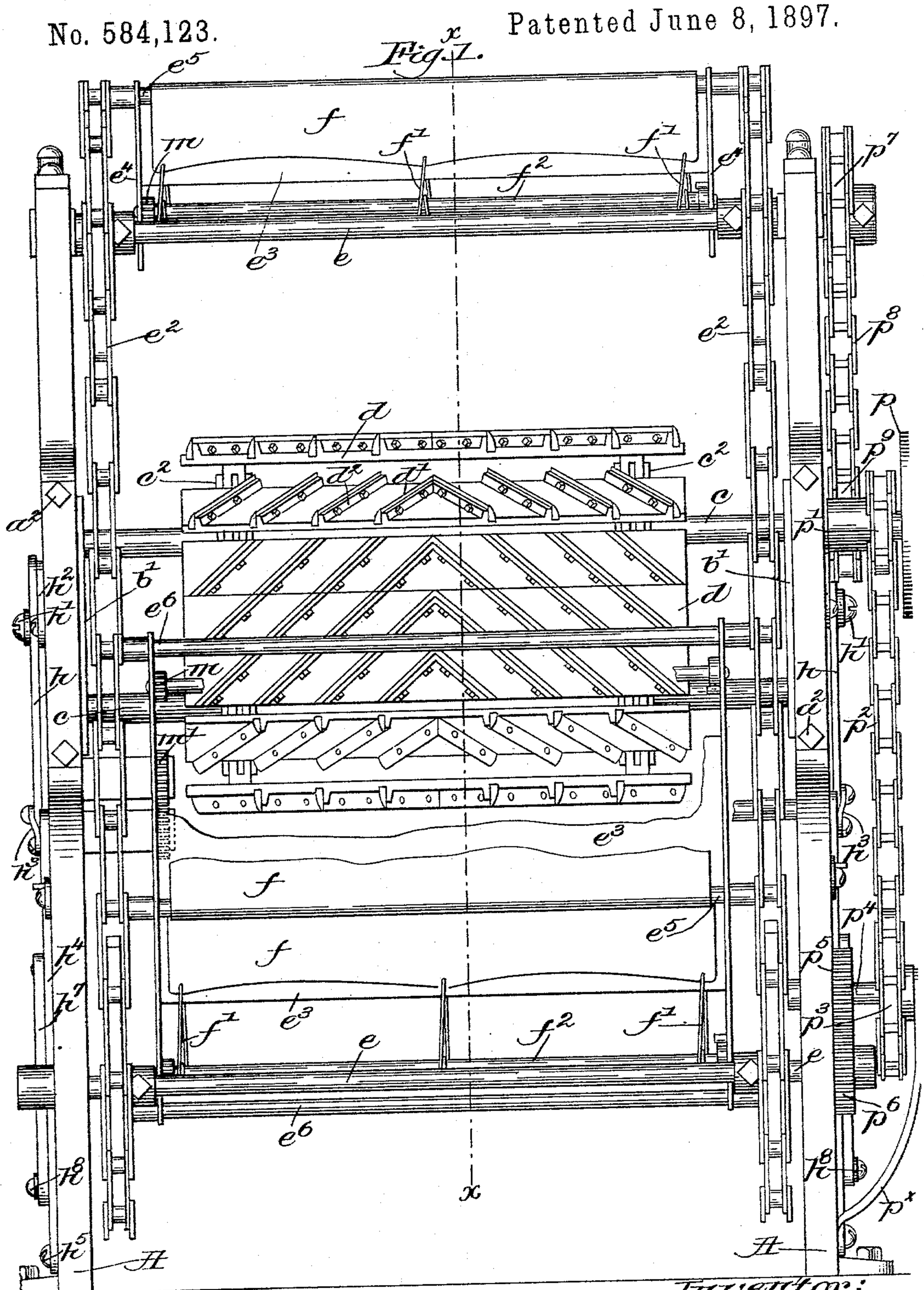

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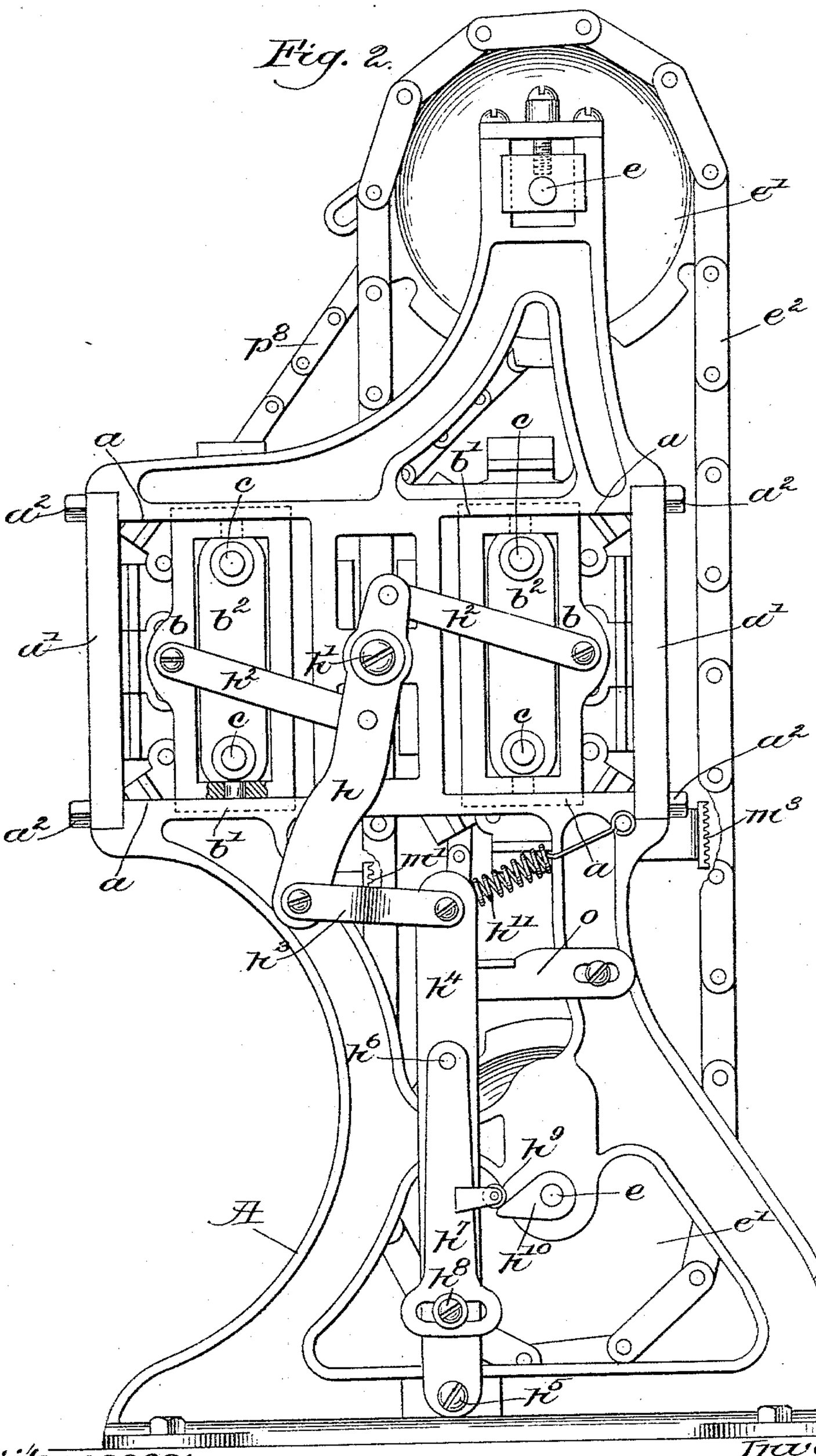
Fig. 2.



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MACHINE FOR TREATING HIDES AND LEATHER.

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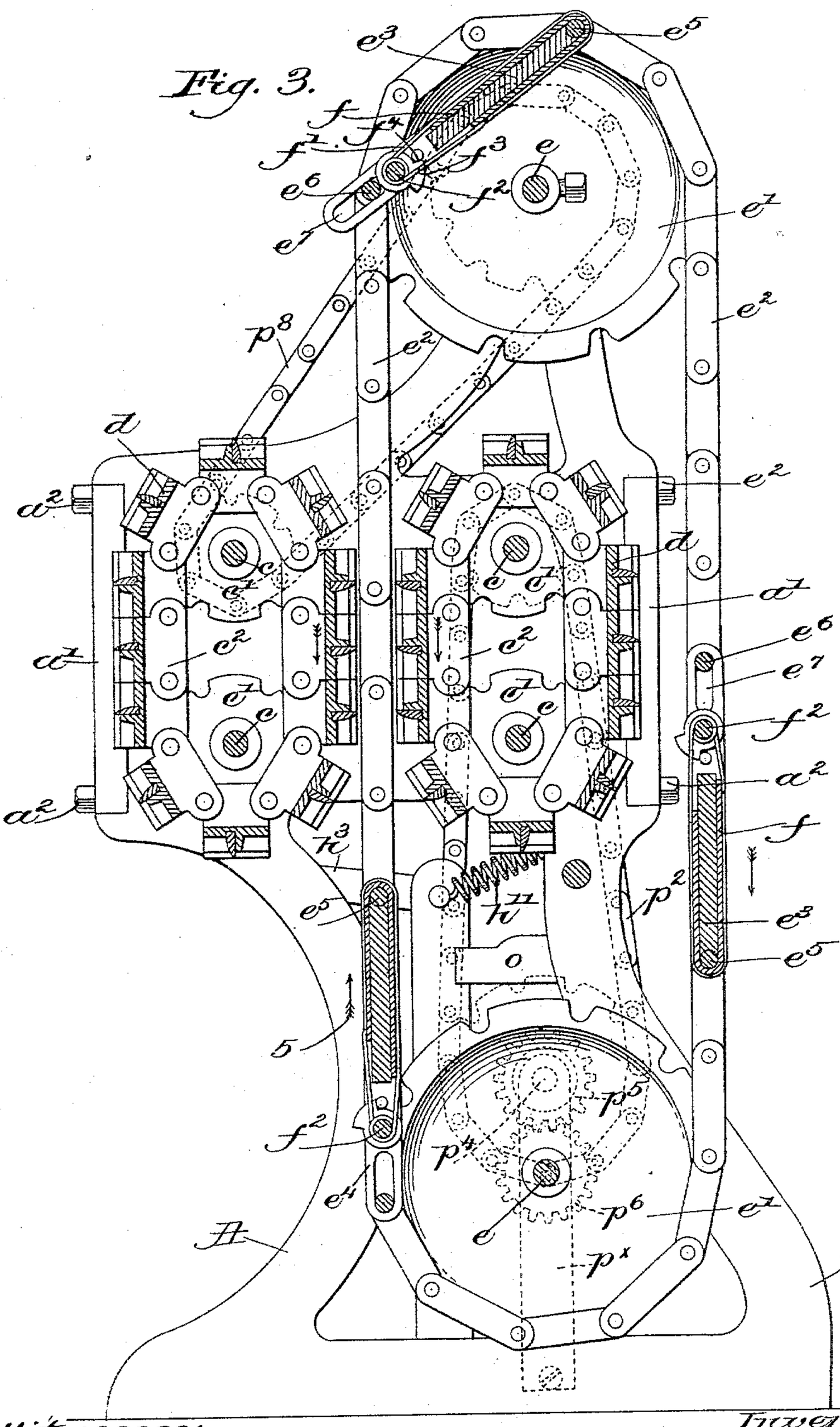
Fig. 3.



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W. B. TURNER.

MACHINE FOR TREATING HIDES AND LEATHER.

No. 584,123. Patented June 8, 1897.

Fig. 4

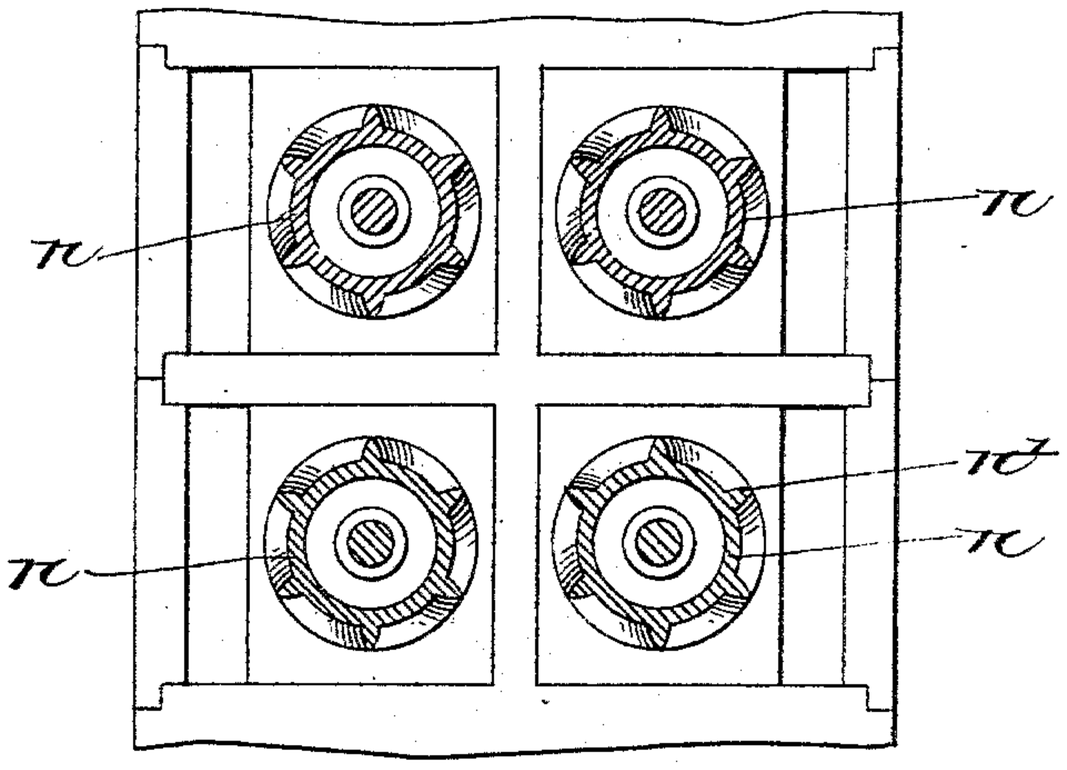
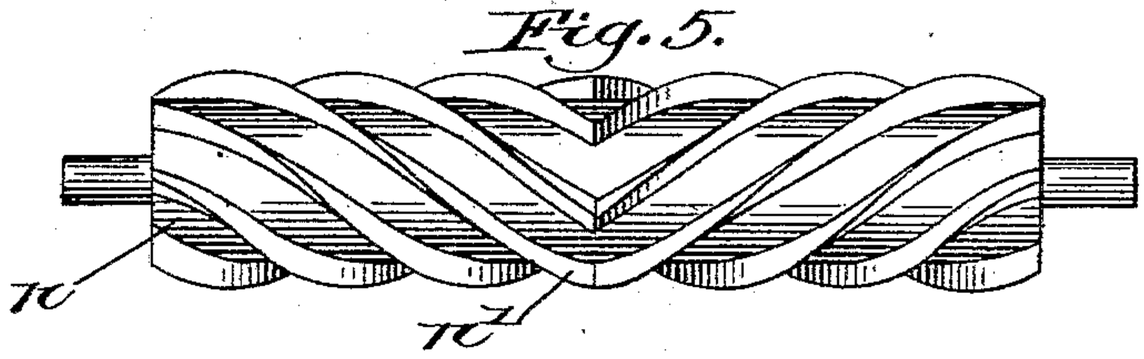


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM B. TURNER, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO THE TANNERS' AND CURRIERS' MACHINERY COMPANY, OF CHARLESTOWN, WEST VIRGINIA.

MACHINE FOR TREATING HIDES AND LEATHER.

SPECIFICATION forming part of Letters Patent No. 584,123, dated June 8, 1897.

Application filed November 12, 1895. Serial No. 568,733. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. TURNER, of Somerville, county of Middlesex, State of Massachusetts, have invented an Improvement in Machines for Treating Hides 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 in machines for treating leather has special reference to machines for slating, fleshing, putting out, and the like.

To enable my invention to be understood, I shall in the following specification describe the same as it will be constructed for putting out—that is, working out from the hide or skin any liquid or tan which may have been previously used in the vat or in the process of tanning, or in otherwise preparing for practical use.

Prior to my invention machines for this purpose have been devised containing a plurality of rollers, each having a series of spirally-arranged vanes, each vane starting from an intermediate point on the roller, diverging rearwardly and toward the ends of the roller, so that as the hide or skin is fed between these rollers these diverging vanes or blades by pressing upon the leather squeeze out the liquid or tan and work the same toward and off at the edges of the hide or skin.

In machines such as I have described it is customary to fold the hide or skin over a suitable support or form and pass the same between the rollers, and after the skin has partially entered or passed a short distance between the rollers it is withdrawn, shifted upon its support or form and again passed between and completely through the rollers, the form or support being returned in an opposite direction to its starting-point for the reception of a new skin.

In my present invention I employ a substantially flat working surface on which the vanes or working projections are angularly and divergingly arranged, so that when the skin is given a relative movement to this working surface more of the working surface is presented to the skin, enabling a greater portion of the skin-surface to be acted upon at one time than is possible with the use of the roller, wherein the working surface acts upon the skin in never more than in a single line extending longitudinally of the roller. For the best results I may employ two of these substantially flat working surfaces, between which the skin is passed, both surfaces performing their work at the same time, thus increasing the capacity of the machine, and preferably these working surfaces are composed of a plurality of independent connected members caused to travel in, it may be, a direction opposite that in which the skin travels.

My invention contemplates mounting one or more work-supports for the leather on an endless chain or carrier for moving the same successively between the working surfaces and always in the same direction, so that no time is lost in returning the work between the working surfaces to its starting-point, the skins being placed upon the work-supports as soon as they reach a position in front or in advance of the working surfaces, and removed from the work-support after they emerge from the opposite sides of the working surfaces. Suitable means are provided for moving the work-support while the skin is upon it and while passing between or past the working surfaces in order that different portions of the skin may be presented to the said surfaces.

In the preferred embodiment of my invention the work-support is composed of a flexible apron passed over a suitable roller, the skin being folded over this apron and standing equally at opposite sides of the roller. When the skin is passed between the working surfaces, that portion which is wrapped over the roller is of course not acted upon by the said surfaces, but before the skin has completely passed between the working surfaces the apron is shifted or rolled to carry that portion of the skin which was in the first place bent over the roller down to one side of the latter, where it can be acted upon by one or the other of the working surfaces. I also preferably employ suitable means for separating the working surfaces temporarily while the skins are shifted on their work-supports.

The above with other features of my invention will be hereinafter fully described, and set forth in the claims.

In the drawings, Figure 1, in front elevation, shows a machine containing one embodiment of my invention; Fig. 2, a left-hand end elevation of the machine shown in Fig. 1; Fig. 3, a vertical cross-section taken on the dotted line $x\,x$, Fig. 1; and Figs. 4 and 5, details showing a modification of my invention.

In the embodiment of my invention herein selected for illustration and shown in the drawings, A A are two substantially like end frames of suitable shape and construction to sustain the several working parts.

The frames A A (see Figs. 2 and 3) are provided at opposite sides with suitable recesses, the edges $a\,a$ of which constitute top and bottom guides for the laterally-sliding rectangular frame-like heads $b\,b$, the entrances to the recesses being normally closed by suitable bars $a'\,a'$, secured by suitable bolts a^2.

The heads $b\,b$ at their inner sides are provided with suitable flanges b', (shown in Figs. 1 and 2,) which hold the said heads in proper alinement with relation to their recesses. In the heads $b\,b$ are journaled, respectively, the swivel-carriers b^2, pivoted top and bottom in the said heads and adapted, therefore, to rotate about a vertical axis, the said swivel-carriers having suitable bearings for the shafts $c\,c$, extending from one to the other frame A A and provided with sprocket-wheels $c'\,c'$. (See Fig. 3.) The sprocket-wheels c' (see Figs. 2 and 3) are arranged in four pairs, the wheels of each pair standing one vertically above the other, and about the wheels of each pair are passed the sprocket-chains $c^2\,c^2$, corresponding links of the two chains of the respective pair of shafts $c\,c$ being connected by and serving as supports for the bar-like working members $d\,d$. (See Figs. 1 and 3.) Each of these working members d is in the present instance provided with a plurality of angularly-arranged ribs or projections, which I shall hereinafter denominate as "working devices" d', the same diverging in opposite directions from a point preferably midway the length of the member, the said ribs or projections being so arranged or placed that when a plurality of the working members stand one next the other, as when passing from one to the other of the sprocket-wheels which carry the same, the angular lips or projections on one member will form substantial continuations of the ribs or projections on the members at either side thereof.

In the preferred embodiment of my invention the angular working devices d' are made independent of their respective working members d, and made readily detachable therefrom, in order that working devices of different shape or construction may be used, if desired.

In the embodiment of my invention herein shown the working devices d' are set in the angular grooves in their respective working members, and are secured in place by bolting to the raised lips d^2 on the members and adjacent the said grooves.

Referring to Fig. 3, it will be clear, in my invention, as shown, that there are two endless series of working members d, which at the middle of the machine, where the two series face each other, present opposite substantially flat working surfaces, over which are distributed the angularly-arranged working devices or ribs, and it is between these two substantially flat working surfaces that the hide or skin to be treated is passed.

In the frames A A, near the tops and bottoms thereof, are journaled the two shafts $e\,e$, each of which is provided near its opposite ends with suitable sprocket-wheels $e'\,e'$, about which are passed the two sprocket-chains $e^2\,e^2$, these chains, at one side of the sprocket-wheels, passing between or in a plane which lies between the two working surfaces referred to. These chains $e^2\,e^2$ carry the work support or supports, of which I preferably employ a plurality, but since all are alike in construction a detailed description of one will be deemed sufficient. Referring, then, to Figs. 1 and 3, each work-support, as shown, consists of a plate or board e^3, provided at its ends with end pieces e^4, which are supported by two rods $e^5\,e^6$, constituting two of the pivots of the chains e^2, said rods extending across the machine from one to the other of said chains. The end pieces e^4 are pivotally mounted upon one of the rods, as e^5, and are slotted at their opposite ends, as at e^7, Fig. 3, for the reception of the other rod e^6, so that as the chains are revolved in unison this board or member e^3 will be carried round and round and each time caused to rise in the direction of the arrow, Fig. 3, between the working surfaces. About this board or member e^3 I prefer to lay a flexible apron f of suitable material, the same being folded or lapped over the pivot-rod e^5, and having its opposite edges joined by cords or connections f', which latter, intermediate the edges of the apron, are passed one or more times about a suitable shaft f^2, rotatably mounted in the end pieces e^4 close to the ends of the slots e^7 in the said end pieces. Rotation of this shaft f^2 will cause the apron f to be shifted or moved upon the board or member $e^{3\times}$.

The several shafts and their wheels may be driven in suitable manner, I having herein shown the power as applied to a pulley p on one of the shafts c, (shown as the upper right-hand shaft in Fig. 1,) said shaft being provided with a sprocket-wheel p', connected by a suitable chain p^2 with a sprocket-wheel p^3, fast on a shaft p^4, journaled in the frame and in a bracket $p^\times$ thereon and having fast on it a spur-wheel p^5, meshing with a wheel p^6, fast on and driving the lower shaft e. The upper shaft e is of course driven through the sprocket-chains e^2 from the lower shaft e, said upper shaft being in turn provided with a

sprocket-wheel p^7, connected by a suitable chain p^8 with a suitable wheel p^9, fast on one of the shafts c of the other pair, (herein shown as the upper left-hand shaft in Fig. 3.) The power therefore applied to the pulley p will cause the endless traveling working surfaces d to move in the direction of the arrows, Fig. 3, and will also cause the several work-supports to travel in the direction of the arrows adjacent thereto.

In operating the machine the hides or skins, saturated to a greater or less extent with the tan or other liquid employed in connection with the treatment of the same, are laid upon the work-supports f as the latter successively reach a position at or about the position indicated at 5, Fig. 3, said hides or skins, by reason of their damp condition, adhering closely to the aprons constituting the said supports.

As the work-support carrying the hide or skin rises between the downwardly-moving working surfaces the angular projections on the latter, by acting firmly upon the hide or skin at opposite sides of the work-support, squeeze out substantially all the liquid or tan contained in the skin and by reason of their angular positions cause the said liquid to be gradually worked in opposite directions toward and off at the lower edges and ends of the skin. After the skins emerge from between and at the tops of the working surfaces they are removed by the operator before the descent of the work-supports at the back of the machine or are permitted to drop before such descent. It will be evident by viewing Fig. 3 that a certain portion of the skin—viz., that portion which is lapped over the rod e^5 at the bend in the skin—will not be acted upon by either of the working surfaces. It is necessary, however, that all portions of the skin should be presented to one or the other of the working surfaces, and to accomplish this I momentarily separate the working surfaces and shift the apron of the work-support to carry this portion of the skin away from the bend and down in position to be acted upon by one of the working surfaces. To accomplish this automatically, I have provided at each side of the machine a lever h, pivoted at h' and connected by links h^2 with the frame-like sliding heads b at that end of the machine, so that vibration of the said lever h will cause the said rods and the shaft and wheels carried thereby to be moved in opposite directions—that is, separated or brought together—according to the movement given to the lever. To move these levers h, I have extended their lower ends and connected the same by suitable links h^3 with the upper ends of other levers h^4, fulcrumed at their lower ends at h^5 to the frames A A. Upon these main levers h^4 I have pivoted at h^6 the depending members h^7, slotted at their lower ends to receive the clamping-screws h^8, said members h^7 being shown as provided with laterally-extended lips in which are journaled suitable rollers h^9, adapted to be acted upon by the cams h^{10}, fast on the lower chain-shaft e, springs h^{11}, acting upon the upper ends of the levers h^4, serving to hold the said rollers h^9 always in operative contact with the said cams or during such portions of the movements of the latter as are necessary for the proper operation of the machine. Each shaft e rotates three times for one complete movement of the chains e^2.

In the operation of the machine the parts are so adjusted that after any work-support carrying a skin has partially passed between the working surfaces the cams h^{10} will engage the rollers h^9 and move the levers h^4 to separate the heads b b and the working surfaces carried thereby to remove the latter momentarily from contact with the skin on the work-support between the same. During this short interval while the working surfaces are separated a suitably-arranged pinion m on the shaft f^2 of the work-support referred to engages a stationary rack m' on the frame, (see Fig. 1,) which latter, by reason of the movement of the chain carrying the work-support, causes the said shaft f^2 to be rotated sufficiently to shift the apron and carry the portion of the skin which had been out of contact with either working surface down upon one side of said support, where during the further movement of the skin between the surfaces it will be acted upon and treated like the rest of the skin, the cams h^{10} permitting the levers h^4 and the working surfaces to be returned quickly by the springs h^{11} to their original operative positions immediately following the shifting of the work-support and skin.

By reference to Fig. 3 it will be seen that there is never a retrograde movement to a work-support such as in machines at present constructed, said work-support always and continuously traveling, and by providing a plurality of work-supports it is possible to cause the skins to be passed between the working surfaces faster than is possible with any reciprocating support, so that the capacity of my machine must of necessity be much greater than that of any machine having a reciprocating support.

I further gain in my machine by having a substantially flat working surface of large area to act upon almost one-half of the skin at once, said surface being provided (see Fig. 1) with a large number of angularly-arranged projections all acting upon the skin at the same time, so that the latter must be more effectively stretched and all liquid more effectively and quickly removed than is possible where there is but a single line of contact and where rollers alone are employed.

Rotative movement of the shaft f^2 of any single work-support by the rack and pinion referred to is limited by a stop-piece f^3, cooperating with a stop-pin f^4 on the adjacent end piece e^4, and during the downward movement of the work-support at the outside of

the machine the apron is returned to its original position by a second rack m^3.

The distance between the working surfaces is determined by a suitable adjustable stop o on the frame, against which the lever h^4 abuts, and by adjusting the position of the member h^7 on the lever h^4 the extent of movement of the working surfaces as the latter are separated may also be varied.

So far as known to me I am the first to separate the working surfaces without necessarily interrupting the movement of the skin between the same to permit said skin to be shifted in order that all parts of its surface may be presented to its working surfaces, whether such shifting is done in a machine having a substantially flat working surface or one wherein said working surface is on a roller. For instance, in Figs. 4 and 5 I have shown a construction wherein a roller-machine may more nearly approach the capacity of the flat surfaces of this machine than is possible with the machines now in use. In Fig. 4 I have shown four rollers $n\,n$, each constructed substantially as shown in Fig. 5 and provided with a plurality of diverging vanes or projections n', said rollers being arranged in pairs, there being two rollers to act in succession upon the portions of the skin at opposite sides of the work-support as the latter passes between them, the rollers being mounted in sliding boxes in order that they may be opened and closed substantially in the manner illustrated in Figs. 1 to 3, inclusive.

My invention is not limited to the precise construction herein shown and described, for the same may be varied without departing from the spirit and scope of my invention.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine of the class described, the combination with a suitable work-support, of a working surface comprising a plurality of connected working members provided with one or more working projections, the working edges of which, when in working position, lie in the same substantially flat plane, and means to impart to said work-support and working surface a relative movement in the direction of a line diagonal to and lying in the plane of said working edges, whereby substances in or on the stock carried by said work-support may be worked thereon by said projection or projections laterally with relation to the direction of said relative movement, substantially as described.

2. In a machine of the class described, the combination with a suitable work-support, of a working surface comprising a plurality of connected working members provided with working projections, having their working edges, when in working position, lying in the same substantially flat plane, means to move said working members relatively to said work-support, and in the direction of a line diagonal to and lying in the plane of said working edges, whereby substances in or on the stock carried by said work-support may be worked thereon by said projections laterally with relation to the direction of said relative movement, substantially as described.

3. In a machine of the class described, the combination with a suitable work-support, of a working surface comprising an endless series of working members provided with working projections having their working edges, when in working position, lying in the same substantially flat plane, means to move said working members relatively to said work-support, and in the direction of a line diagonal to and lying in the plane of said working edges, whereby substances in or on the stock carried by said work-support may be worked thereon by said projections laterally with relation to the direction of said relative movement, substantially as described.

4. In a machine of the class described, the combination with a suitable work-support, of an endless series of traveling working members provided respectively with a plurality of angularly-arranged working projections, the latter, on each member, diverging from an intermediate point toward the ends of the member, substantially as described.

5. In a machine of the class described, the combination with a suitable work-support, of an endless series of traveling working members provided respectively with angularly-arranged working projections, the latter, on each member, diverging toward the ends of said member, the projections on one member when in working position constituting substantial continuations of the projections of an adjacent member, substantially as described.

6. In a machine of the class described, the combination with a suitable work-support, of a plurality of working surfaces provided respectively with one or more working projections having working edges in the same substantially flat plane, said working surfaces, with their projections, being arranged to act from opposite sides of and upon the stock carried by said work-support, and means to impart to said work-support and working surface a relative movement in the direction of a line diagonal to and lying in one of the planes of said working edges, whereby substances in or on the stock carried by said work-support may be worked thereon by said projections laterally with relation to the direction of said relative movement, substantially as described.

7. In a machine of the class described, the combination with a suitable work-support, of a plurality of working surfaces, comprising respectively an endless series of working members each provided with one or more working projections having working edges, when in operative position, lying in the same substantially flat plane, said working surfaces being arranged to act from opposite sides of the said work-support upon the stock carried thereby, and means to impart to said

work-support and working surfaces a relative movement in the direction of a line diagonal to and lying in one of the planes of said working edges, whereby substances in or on the stock carried by said work-support may be worked thereon by said projections laterally with relation to the direction of said relative movement, substantially as described.

8. In a machine of the class described, the combination with two endless series of working members and means to move the same, of a work-support movable between said series, and an endless carrier for said work-support, substantially as described.

9. In a machine of the class described, the combination with two working surfaces, each provided with a plurality of working projections, arranged with the working edges of the projections on the respective surfaces in the same substantially flat planes, the working projections on the said surfaces facing each other, of one or more work-supports, and an endless carrier for and to move the same between said working surfaces in the direction of a line diagonal to and lying in the plane of said working edges, whereby substances in or on the stock carried by the respective work-supports may be worked thereon by said projections laterally with relation to the direction of said relative movement, substantially as described.

10. In a machine of the class described, the combination with a working surface, of a work-support, a carrier for the same, means to move said work-support and working surface one relatively to the other, and means to automatically shift the position of said work-support relatively to said carrier to cause different portions of the material thereon to be presented to the working surface, substantially as described.

11. In a machine of the class described, the combination with a working surface, of a work-support, an endless carrier to move the same past said working surface, and means to automatically move the said work-support on or with relation to its carrier to cause different portions of the material on said work-support to be presented to said working surface, substantially as described.

12. In a machine of the class described, the combination with a working surface, of a work-supporting apron over which the skin is laid, an endless carrier for said apron, and means to shift the said apron to cause different portions of said skin to be presented to the said working surface, substantially as described.

13. In a machine of the class described, the combination with a working surface, of a work-support movable past the same, means to separate the working surface and work-support while the one is passing the other, and means to shift said work-support to present a new portion to the working surface while the work-support and working surface are so separated, substantially as described.

14. In a machine of the class described, the combination with two working surfaces arranged facing each other, of a work-support movable between the same, means to separate said working surfaces, and means to shift said work-support while the surfaces are so separated, substantially as described.

15. In a machine of the class described, the combination with two working surfaces, of one or more work-supports, an endless carrier for the same, means to separate said working surfaces, and means to automatically shift said work-support with relation to its carrier while between said working surfaces, and to return said work-support to its normal position relatively to its carrier before said support again enters between said working surfaces, substantially as described.

16. In a machine of the class described, the combination with two opposite working surfaces, of one or more work-supports, and endless chains between which the same is mounted, said work-support at its opposite ends being carried by pintles on different links in its chains, substantially as described.

17. In a machine of the class described, the combination with opposite working surfaces, of a pair of endless chains, rods joining different links of one chain with corresponding links of another, and a work-support carried by and between said rods, substantially as described.

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

WILLIAM B. TURNER.

Witnesses:

FREDERICK L. EMERY,

AUGUSTA E. DEAN.