R. J. WATSON & A. E. OZOUF.

SKINNING MACHINE.

APPLICATION FILED JAN. 30, 1915.

1,223,129.

Patented Apr. 17, 1917.

5 SHEETS—SHEET 1.

Fig. 1

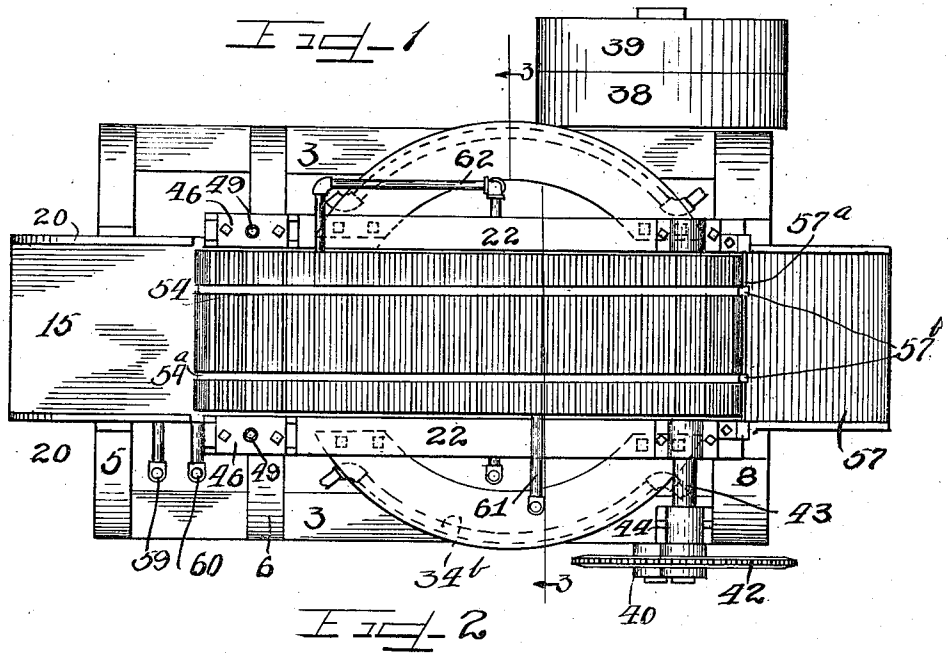
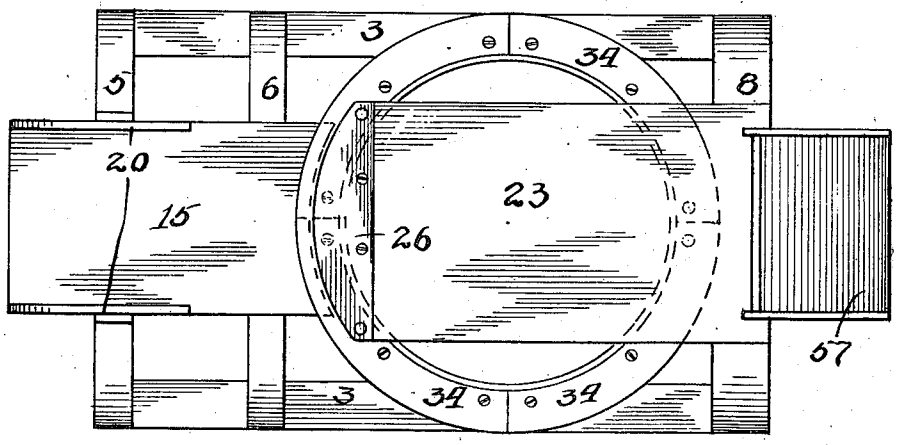


Fig. 2



Witnesses

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SKINNING MACHINE.

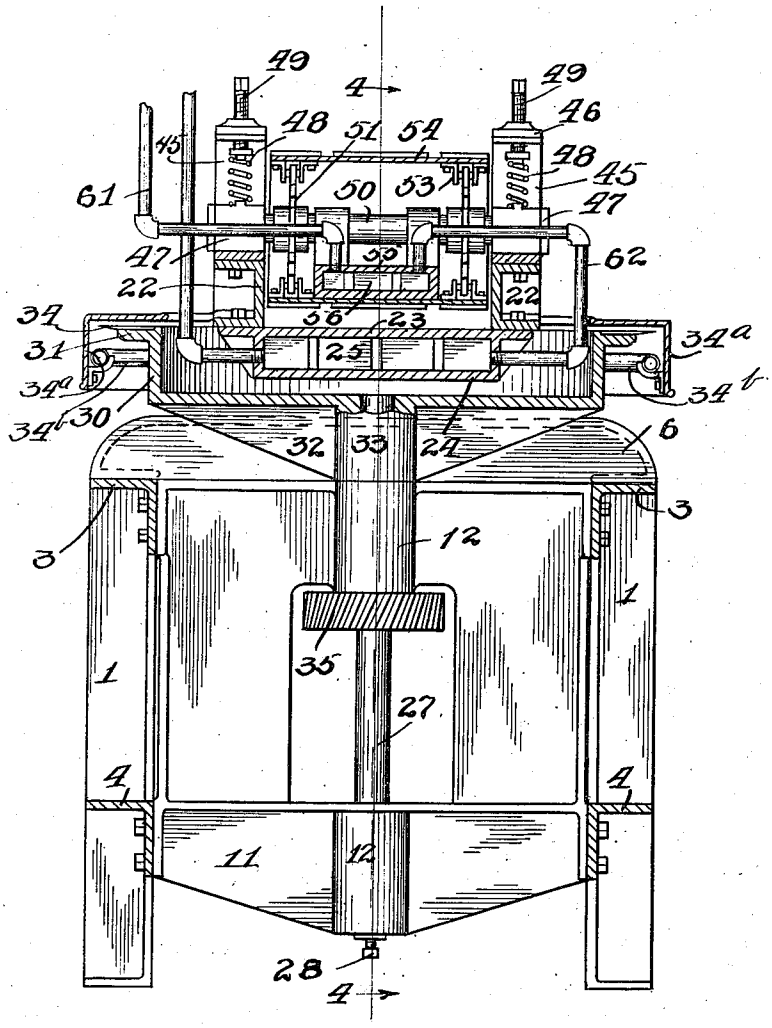
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5 SHEETS—SHEET 2.

Fig. 3



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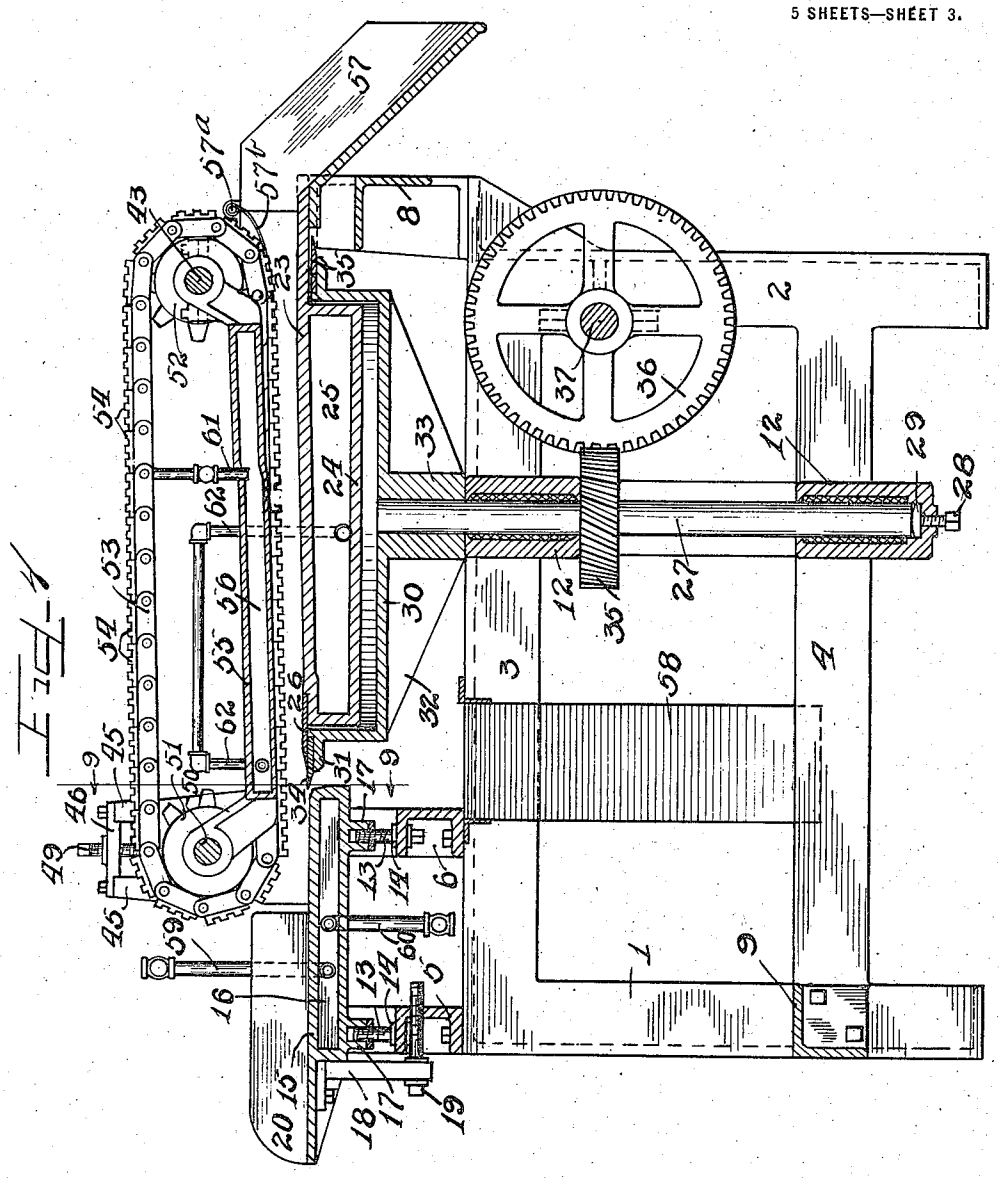
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5 SHEETS—SHEET 3.



Witnesses
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5 SHEETS—SHEET 4.

Fig. 5

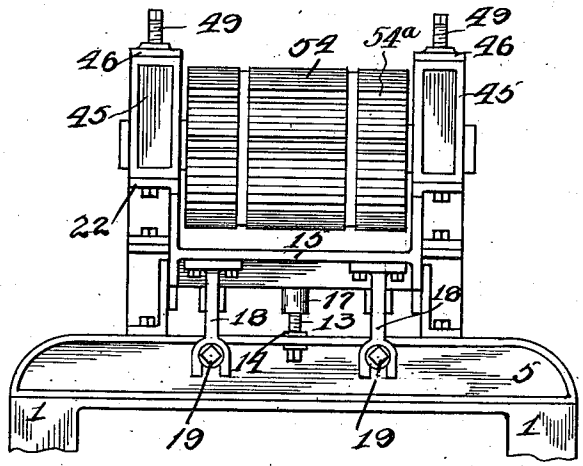


Fig. 6

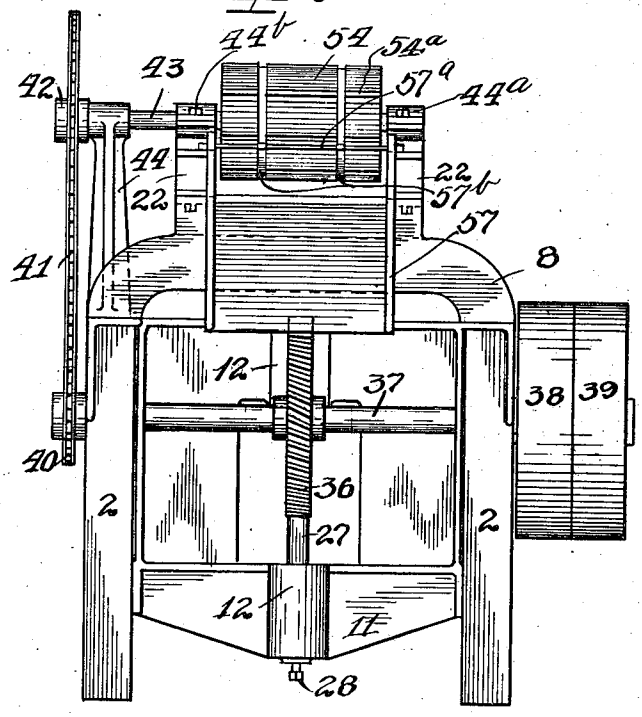


Fig. 11

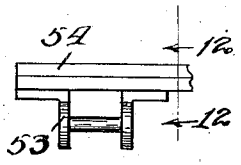
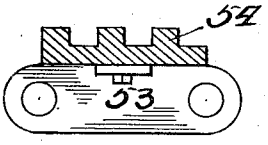


Fig. 12



Witnesses

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5 SHEETS—SHEET 5.

Fig. 8

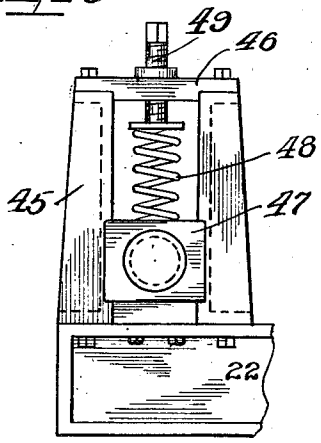


Fig. 9

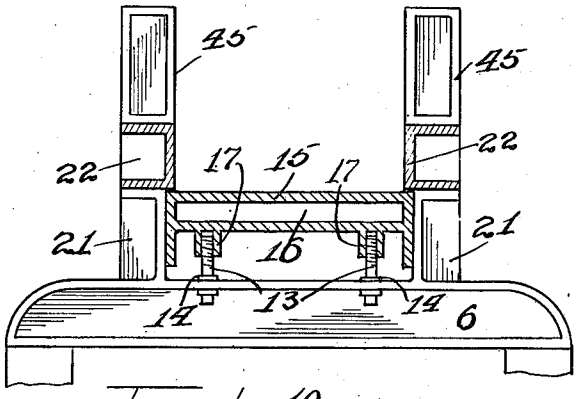


Fig. 10

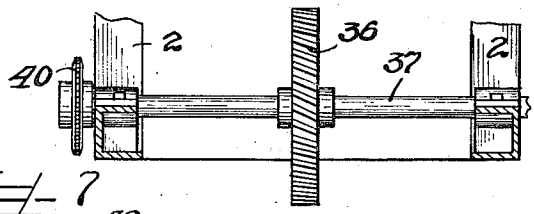
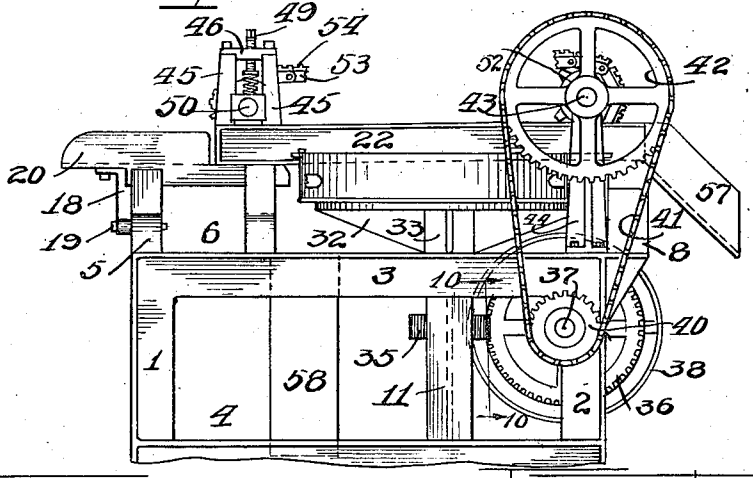


Fig. 7



Witnesses

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UNITED STATES PATENT OFFICE.

ROBERT J. WATSON AND ARTHUR E. OZOUF, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE ALLBRIGHT-NELL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SKINNING-MACHINE.

1,223,129. Specification of Letters Patent. Patented Apr. 17, 1917.

Application filed January 30, 1915. Serial No. 5,220.

To all whom it may concern:

Be it known that we, ROBERT J. WATSON and ARTHUR E. OZOUF, citizens of the United States, and residents of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Skinning-Machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to a means for removing the skin from the fat associated therewith taken from the carcass of a hog. Many machines have been designed heretofore for this purpose, but the objection thereto has been that the cutting knives have torn and ripped the skin, an occurrence which, if taking place even momentarily, ruins the hide. It is essential therefore that the skin be separated from the fat by a mechanism which precludes such a possibility occurring, and it is with this purpose in view that the present machine has been designed.

It is an object of this invention to construct a machine wherein mechanisms are provided for advancing the fat forwardly into the field of operation of a revolving knife, which acts to sever the skin from the fat, permitting discharge of each thereof by separate means to convenient points for removal.

It is also an object of this invention to construct a machine wherein the fat back to be skinned is advanced with the skin surface down by a suitable feeding mechanism along a heated table, and thence into the field of operation of severing mechanisms which act to slice the skin from the fat back, permitting discharge of each thereof into separate compartments.

It is also an important object of this invention to construct a machine wherein the fat to be separated from the skin adhering thereto is advanced upon a suitable internally heated table into the field of operation of a circular horizontally rotating knife member by suitable advancing mechanism, heating elements also associated with said advancing mechanism and said knife member insuring a relatively high temperature in the field of operation, so that the severing operation takes place with the greatest ease.

It is furthermore an important object of this invention to construct a skinning machine wherein the advancing mechanism for the fat from which the skin is to be taken is adjustably mounted to automatically take care of variations in the thickness of the product operated upon.

It is finally an object of this invention to construct a fat back skinning machine wherein the conveying, supporting and severing mechanisms are all associated with heating means to maintain the temperature of the product operated upon at a predetermined point, thus greatly facilitating the operation.

The invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a top plan view of a device embodying the principles of our invention.

Fig. 2 is a similar view thereof with parts of the mechanisms omitted.

Fig. 3 is a transverse vertical section taken on line 3—3 of Fig. 1, with parts in elevation.

Fig. 4 is a longitudinal vertical section taken through the machine with parts in elevation on line 4—4 of Fig. 3.

Fig. 5 is a fragmentary view of the upper portion of one end of the machine.

Fig. 6 is a fragmentary end view of the upper portion at the other end of the machine.

Fig. 7 is a reduced fragmentary side elevation of the upper portion of the machine with parts omitted.

Fig. 8 is a detail view of one of the adjustable bearing members for the feeding means.

Fig. 9 is a detail section taken on line 9—9 of Fig. 4.

Fig. 10 is a detail sectional view taken on line 10—10 of Fig. 7.

Fig. 11 is a fragmentary end view of one of the links of the feeding mechanism, showing the end of a cross member attached thereon.

Fig. 12 is a section on line 12—12 of Fig. 11.

As shown in the drawings:

The field of operation of the machine is

disposed substantially at ordinary table height above the floor, and for this purpose a frame is constructed consisting of two unitary side members each comprising forward and rear legs 1 and 2, a side sill member 3, and a longitudinally extending horizontal brace member 4, extending from one to the other of said legs 1 and 2, as clearly shown in Fig. 4. At the forward end of the machine said side frame members are joined one to another by transversely extending curved channel bracket members 5 and 6, which are bolted or secured in any suitable manner to the horizontal webs of the side sill members 3, and at the rear end of the machine another transverse channel bracket member 8, is provided.

A lower cross brace member 9, of angle section is bolted at the front end of the frame between the legs 1, of the side members. Another cross frame member 11, is connected between said side members near the rear end of the frame, and has formed integral therewith at the middle portion thereof two vertically alined bearings 12. Extending upwardly and rotatably through slots in the upper flange of the respective cross channel brackets 5 and 6, are adjusting bolts 13, which may be locked and are prevented from downward movement through said flanges by nuts 14, threaded upon the bolts. Partially supported upon said bolts is a table 15, which is cored out to afford a heating steam space 16, and said table, on its under wall, is provided with downwardly directed interiorly threaded bosses 17, into which said adjusting bolts 13, engage. Also assisting in supporting said table 15, are end brackets 18, which are bolted through the under surface of the forward end of the table and extend downwardly, and are held in position by means of bolts 19, which engage through slots in said brackets 18, and thread into the cross channel bracket member 5.

Said table 15, is provided with side walls 20, which serve to guide the fat introduced into the machine, said side walls being formed integral with the table, and extending rearwardly therealong to a point beyond the middle of said table, as clearly shown in Fig. 4. The cross bracket member 6, is provided with upwardly directed integral extensions 21, near each end thereof, and resting thereupon and bolted thereto are channel shaped guide members 22, which are alined parallel with the side walls 20, and terminate at their ends closely adjacent to the ends of said side walls 20, so that the material operated upon as it passes along the table 15, moves from contact with the guide walls 20, into contact with the guide walls 22. At their other ends said channel guide members 22, rest upon and are bolted to a shelf or table member 23, which is provided with an integral extension 24, cored out to afford a heating steam space 25. Said shelf member 23, at its rear end, is supported upon and bolted to the rear cross channel bracket member 8. The forward end of said shelf member 23, is rounded, and recessed thereinto is a rounded stripper blade member 26. Journaled in said respective vertical bearings 12, on the cross frame member 11, is a vertical shaft 27, and in the lower bearing 12, a set screw 28, is provided, which bears upwardly beneath a rounded step bearing member 29, to raise or lower the shaft as desired. Secured upon the upper end of said shaft 27, is a cylindrical member 30, having a horizontal peripheral flange 31, integral therewith, and with webs 32, extending radially inwardly and downwardly and merging into a hub 33. The hub 33, may rest upon the upper end of the upper bearing 12, dependent upon the adjustment of the bolt or screw 28, and the cored out extension 24, of the shelf 23, projects downwardly within said cylindrical member.

Secured upon the peripheral flange 31, in any suitable manner is a cutting blade made up of a plurality of arc shaped sections 34, and the arrangement of the parts is such that the stripping blade on the shelf member 23, bears downwardly in close relation with said cutting blade 34, but spaced inwardly a small amount from the cutting edge thereof. Protecting arc-shaped members 34[a], are provided on each side of the machine secured to the lower flanges of the guides 22, and extending downwardly around the revolving knife 34, and disposed within said arc-shaped members are heating steam pipes 34[b].

A helical gear 35, is secured upon the vertical shaft 27, and is driven by a larger helical gear 36, secured upon a transverse horizontal shaft 37, journaled in bearings on each of the end legs 2, of the frame. Mounted upon the outer end of said transverse shaft 37, at one side of the machine are tight and loose pulleys 38 and 39, respectively, by which a drive from any suitable source of power is transmitted to the machine. Secured upon the other end of said shaft 37, is a sprocket wheel 40, and trained thereabout is a chain 41, which is also trained about a large sprocket wheel 42, mounted upon a shaft 43, extending transversely of the machine and journaled in an upright bearing member 44, and other bearing members 44[a], provided for the purpose on the rear end of the machine, the bearing member 44, being bolted upon one of the side sills of the frame. At the forward end of the machine on each side thereof, are two pairs of upright guide members 45, which are bolted upon said channel side wall guiding members 22, the members of each pair connected at their upper ends by a cross piece 46. Slidably mounted loosely between

each pair of said uprights 45, as clearly shown in Fig. 8, is a bearing block 47, on the upper side of which bears a coiled compression spring 48, said spring at its other end bearing against a disk or plate on the lower end of an adjusting bolt 49, which is threaded through said cross piece 46, whereby the stress on said spring may be varied. Journaled in said bearing blocks 47, is a shaft 50, and secured thereon near each end thereof are sprocket wheels 51. Similarly sprocket wheels 52, are secured upon the shaft 43, and trained about each pair of sprocket wheels 51 and 52, are chains comprising links 53. Bolted to corresponding links on each of the chains are cross bars 54, the outer surface of each of which, as clearly shown in Figs. 1, 4, and 12, is longitudinally grooved or serrated to afford a plurality of teeth, so that said assembled links and cross bars afford substantially a flexible toothed rack member. Each of said cross bars 54, is provided with transverse grooves near each end which thus afford continuous longitudinal grooves 54ª, in the flexible toothed rack member.

A rigid member 55, is supported upon and between said respective shafts 43 and 50, as clearly shown in Fig. 4, and is cored out to afford a heating steam space 56, the under surface of said member being flat affording a bearing surface for the under run of the feeding mechanism. Of course, as pointed out, the blocks 47, fit loosely in the guides 45, in order that the angularity of the long member 55, which is journaled upon said respective shafts 43 and 50, between the sprocket wheels thereon, may not cause said bearing blocks to jam in the guides, due to the radial movement imposed thereon about the shaft 43.

At the rear end of the machine a discharge chute 57, is provided, which is secured on the under surface of the shelf member 23, the cross bracket member 8, being recessed for the purpose. A cross rod 57ª, is mounted transversely over the walls of said chute, and secured thereon are resilient stripper elements 57ᵇ, which bear upwardly beneath the flexible rack member, engaging in the grooves 54ª, thereof to separate the fat having a tendency to cling thereto. Another discharge chute 58, is provided beneath the rear end of the table member 15, so that the skin which is severed from the fat by the revolving blade 34, falls downwardly into said chute and is discharged at a convenient point. A steam inlet pipe 59, leads into the steam space 16, of the table 15, and another steam pipe 60, leads outwardly therefrom, of course said steam pipes being controlled by suitable valves and provided with flexible connections (not shown) to permit adjustment of said table 15. A steam pipe inlet 6 provided with any suitable flexible connection (not shown) admits steam into the steam space 56, of the member 55, and another pipe 62, connected in said steam space, conveys the steam therefrom by means of another flexible connection (not shown, and which of course may be of any well known type of steam hose) into the steam space 25, of the shelf member 23.

The operation is as follows:

The fat which is to be skinned is introduced upon the table 15, with the skin surface down, and is moved forwardly until the upper portion thereof is engaged by the feeding mechanism, consisting of the traveling link mechanism with the toothed cross bars 54, thereon. This mechanism serves to advance the material and as the same moves along the table 15, it is brought in contact with the revolving circular knife 34, which revolves horizontally in a plane a trifle above the plane of the table top 15, so that it acts efficiently to sever the skin from the fat, the skin dropping downwardly upon the chute 58. The fat, however, being still in engagement with the advancing tooth mechanism, moves over the rotating knife 34, and over the inclined edge of the stripper blade 26, and thence rearwardly on the shelf member 23, which is inclined upwardly a slight amount to the discharge chute 57. The table 15, is heated by steam in the steam space 16, thereof, and similarly the shelf member 23, is heated internally by steam within the compartment 25. Likewise the under run of the feeding mechanism is caused to bear upwardly against the member 55, which is also internally heated.

The table 15, may be elevated or lowered, as desired, by loosening the bolts 19, and adjusting the bolts 13, and similarly the table may be moved in a horizontal plane for adjustment toward or away from the revolving knife 34, by loosening the bolts 13, and adjusting the bolts 19. The revolving knife 34, may also be adjusted to various horizontal planes of rotation by adjustment of the small bolt 28, at the bottom of the lower bearing 12, of the shaft on which the revolving knife is secured. The feeding mechanism for the material acted upon is automatically adjustable, the shaft 50, not only having a pivotal movement about the shaft 43, due to the interposition of the rigid member 55, between said shafts, but due to the fact also that said shaft 50, is journaled in bearing blocks 47, which are loosely slidable in vertical guides 45, and normally impelled downwardly by compression springs 48. Due to the fact that the revolving knife is driven from the shaft 27, which is in turn driven by the intermeshing helical gears 35 and 36, the latter being secured upon the shaft 37, which has sprocket and chain connections with the feeding mechanism, said mechanisms operate synchronously. As al-

ready pointed out, the respective steam connections to the various heating elements of the machine are provided with flexible connections in order to permit adjustment of the heating elements. It is obvious that the entire neighborhood and field of operation of the machine is maintained at a relatively high temperature, so that the skin is easily severed from the fat and the passage of the material through the machine is facilitated.

We are aware that various details of construction may be varied through a wide range without departing from the principles of our invention, and we therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

We claim as our invention:

1. In a machine of the class described, an adjustable table to receive material thereon, heating elements therein to heat the material, feeding mechanisms for the material, a horizontally rotatable knife adapted to sever a skin from the material fed forwardly on said table by said feeding mechanisms, and means adjusting said table vertically with respect to said knife.

2. In a device of the class described, a table, means for adjusting the same vertically, feeding means, cleaning members associated therewith, a horizontally rotatable knife adapted to sever skins from the material fed along said table into the machine by said feeding means, and means driving said knife and feeding means synchronously.

3. In a machine of the class described, a horizontally rotatable knife adjustable in various horizontal planes of rotation, automatically adjustable feeding means for feeding material into the field of operation of said knife, and heating elements associated with said knife and with said feeding means and movable therewith adapted to maintain the material at a relatively high temperature in the field of operation of said machine.

4. In a device of the class described a horizontally rotatable vertically adjustable knife, adjustable mechanism for feeding material into the field of operation thereof, and a plurality of heating elements associated with said knife and mechanism and movable therewith to maintain the material at a predetermined temperature.

5. In a device of the class described, a frame, a knife revolubly mounted thereon, adjustable mechanism feeding material into the field of operation of said knife, and means movable therewith for heating the material as it moves into and out of the field of said knife.

6. In a device of the class described a revoluble knife, automatically adjustable feeding mechanisms to advance the material into the field of operation of said knife, a heating element disposed closely adjacent said knife around which the knife is adapted to move, and means for heating the feeding mechanism.

7. In a machine of the class described a frame, a knife horizontally rotatable therein, an adjustable table to receive the material to be acted upon, heating elements therein, and movable therewith, mechanisms for feeding said material along said table into the field of operation of said knife, and means heating said feeding mechanisms.

8. In a device of the class described adjustable cutting mechanism, automatically adjustable feeding means adapted to feed material into the field of operation of said cutting mechanism, and heating elements associated with said cutting mechanism and with said feeding means and movable therewith adapted to maintain the material operated upon at a predetermined temperature in the field of operation of the machine.

9. In a machine of the class described, a frame, a vertical shaft mounted therein, an adjustable feeding table on said frame, means therein for heating the same, a revoluble cutting knife mounted on said shaft and rotated thereby, means adjusting said shaft vertically to change the plane of rotation of said knife, pivotally mounted feeding mechanism adapted to convey the material from said feeding table into the field of operation of said knife, and a plurality of heating elements associated with said feeding mechanism and with said cutting knife for heating the material operated upon.

10. In a machine of the class described a frame, a vertical shaft mounted therein, a horizontally rotatable knife mounted on the upper end thereof and rotated thereby, means adjusting said shaft vertically to change the plane of rotation of said knife, a conveying mechanism mounted on the upper end of the machine adapted to move material into the field of operation of said knife, means for cleaning the same, one end of said conveying mechanism adjustably mounted to automaticaly adapt said mechanism for operation on material of different thicknesses, and a plurality of heating elements movable with said knife and with said conveying mechanism to heat the material operated upon, said cleaning means mounted on said frame to contact said conveying mechanism.

11. In a machine of the class described a frame, a cutting knife horizontally rotatable therein, means adjusting said knife vertically into various horizontal planes of rotation, a feeding table, heating means therefor, means adjusting the table vertically with respect to said knife, a continuous link feeding mechanism disposed above said table and knife to move material from said table into

the field of operation of said knife, and heating elements disposed adjacent said knife and over which the material operated upon is caused to pass, and another heating element mounted beneath the lower run of said feeding mechanism to heat the same and the material operated thereon therebeneath.

In testimony whereof we have hereunto subscribed our names in the presence of two subscribing witnesses.

ROBERT J. WATSON.
ARTHUR E. OZOUF.

Witnesses:
CHARLES W. HILLS, Jr.,
FRANK K. HUDSON.