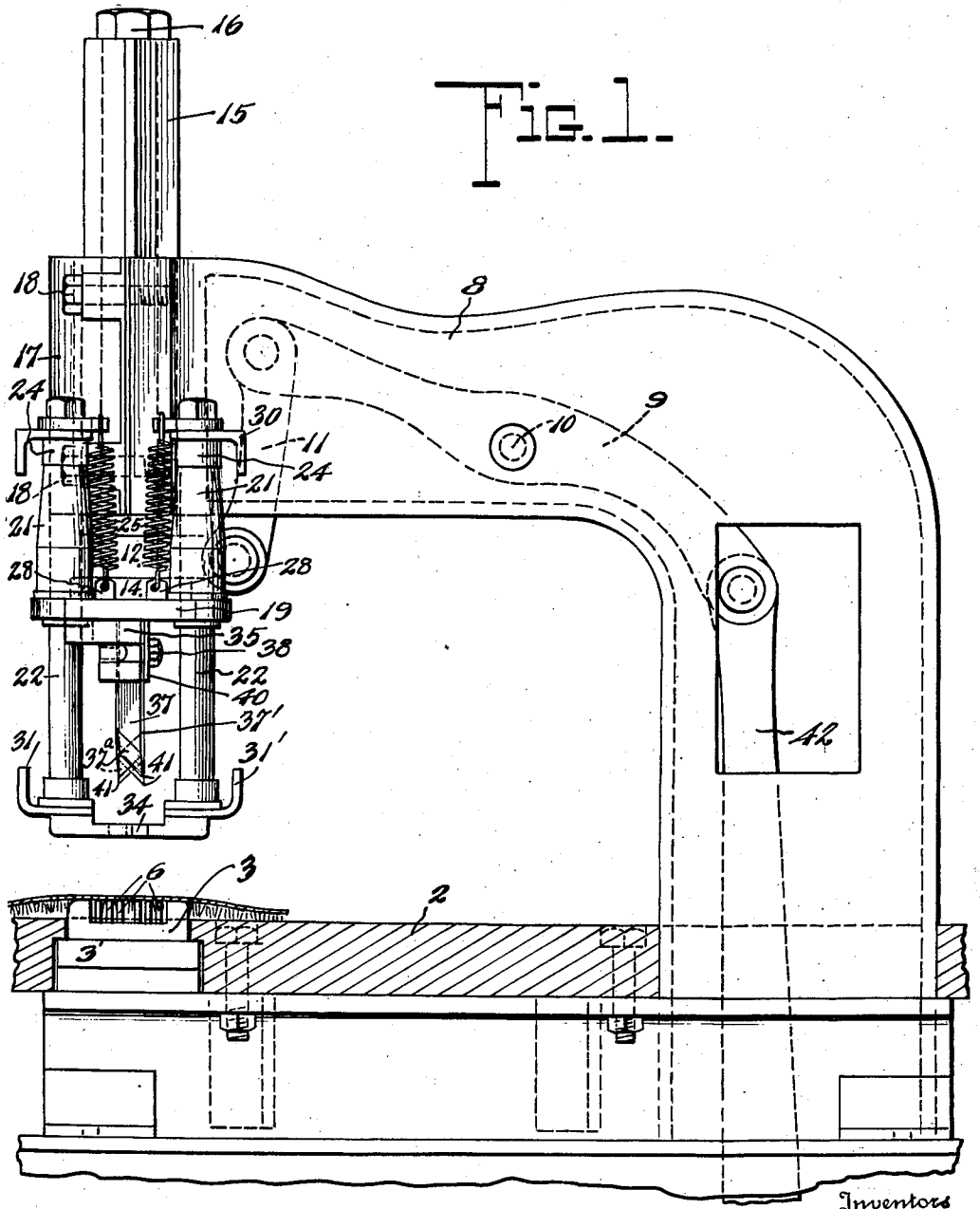
April 28, 1936. M. E. RUTTER ET AL 2,038,857

METHOD AND APPARATUS FOR CUTTING FUR

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Fig. 1.



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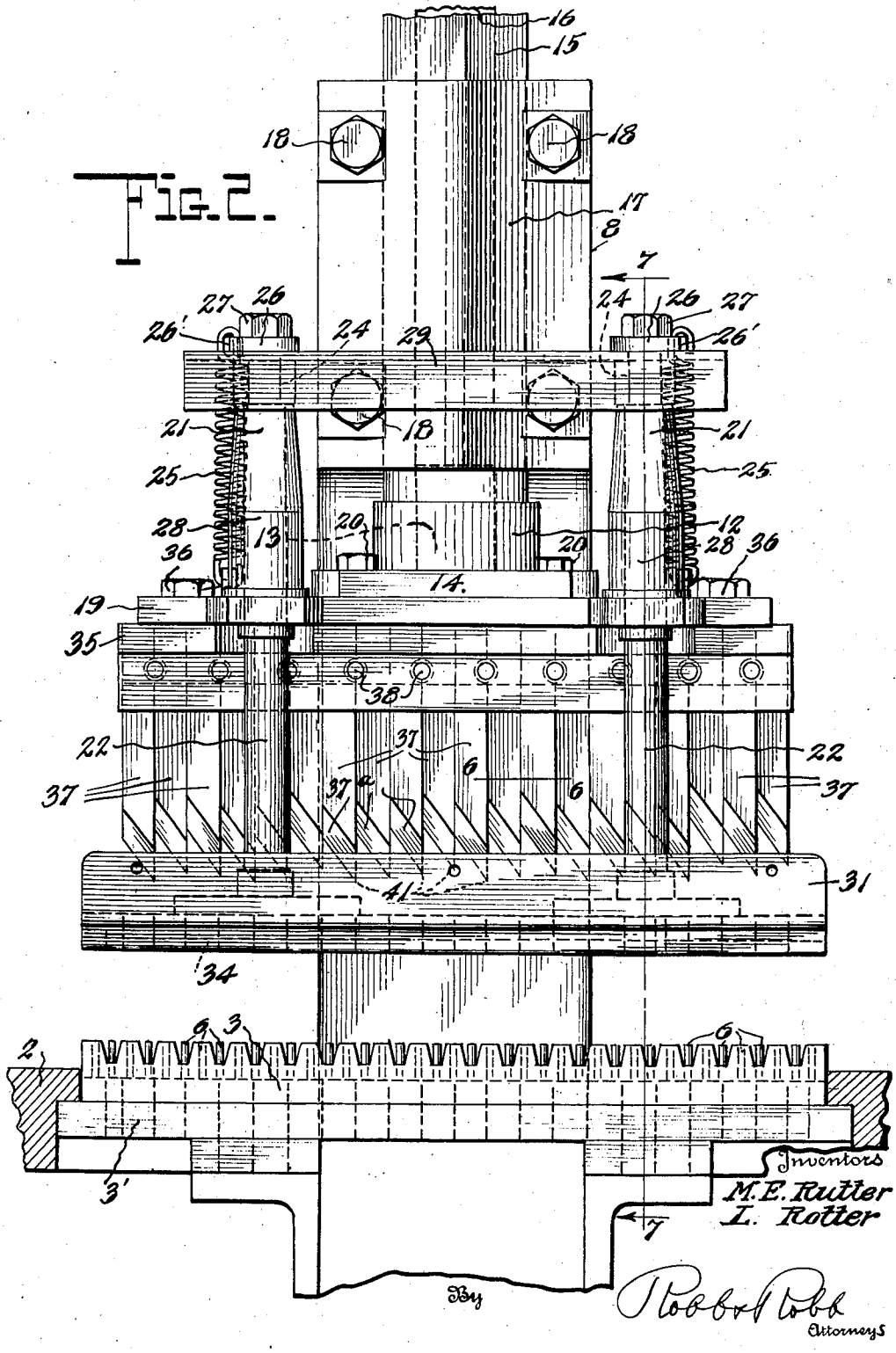
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METHOD AND APPARATUS FOR CUTTING FUR

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Fig. 2.



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Fig. 3.

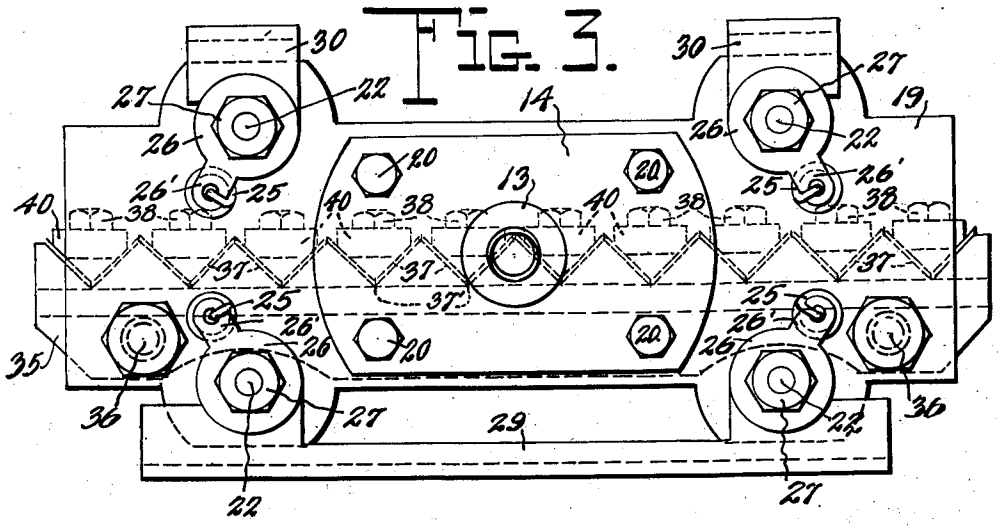


Fig. 4.

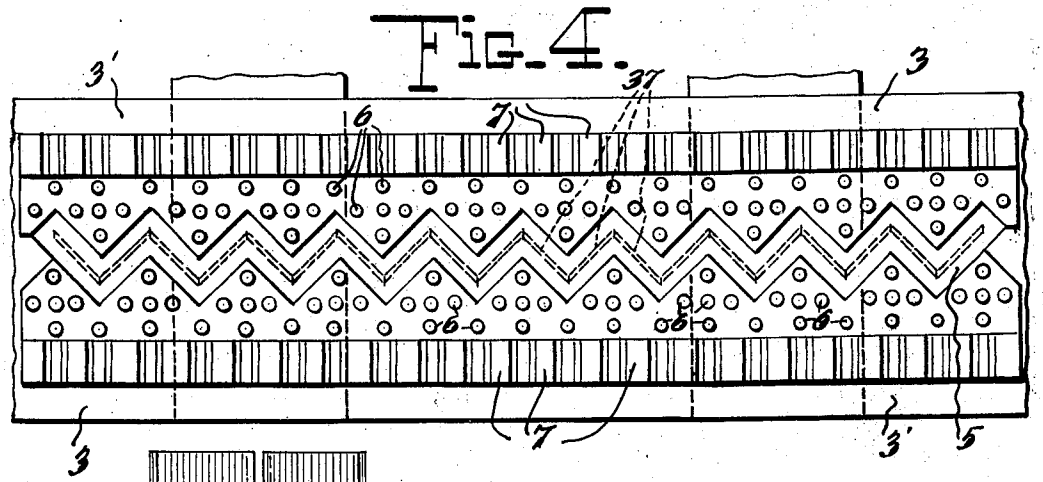


Fig. 5.

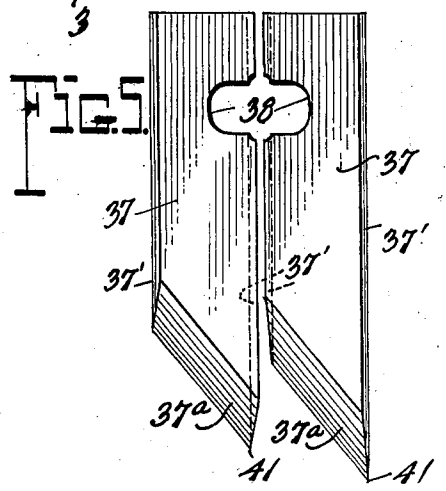
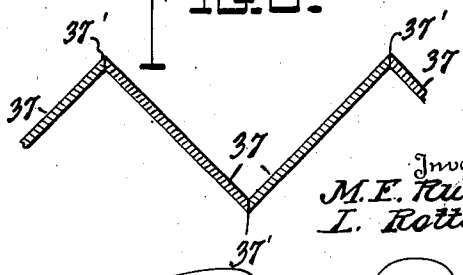


Fig. 6.



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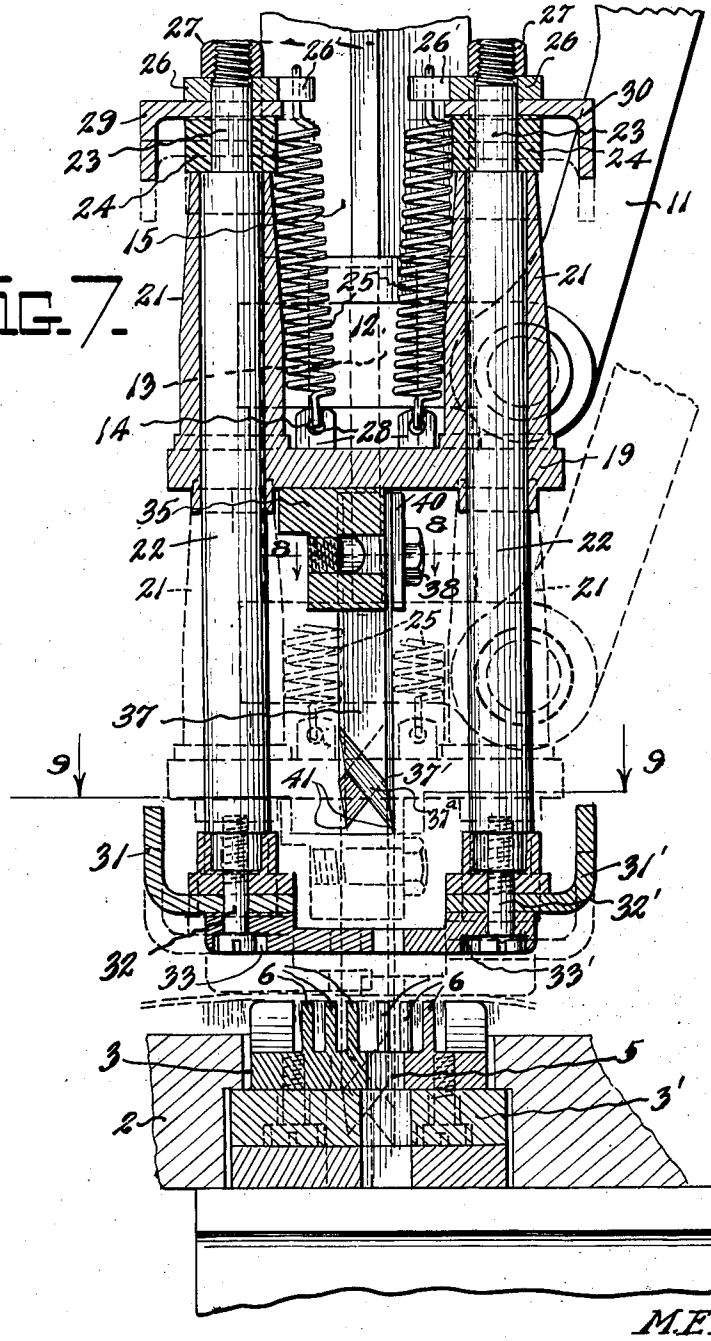
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METHOD AND APPARATUS FOR CUTTING FUR

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Fig. 7.



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Fig. 8.

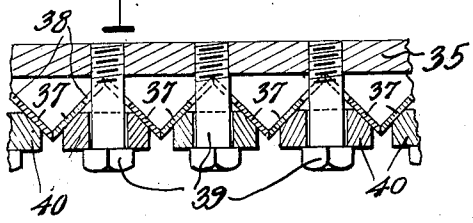


Fig. 9.

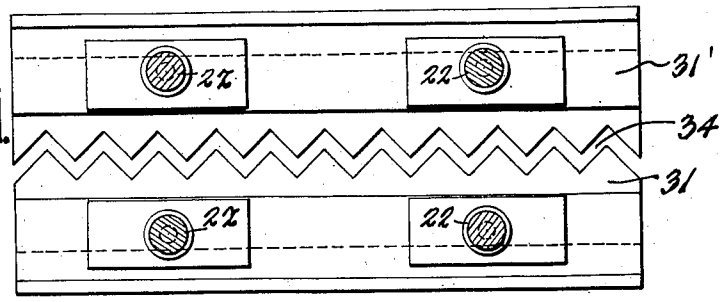


Fig. 10.

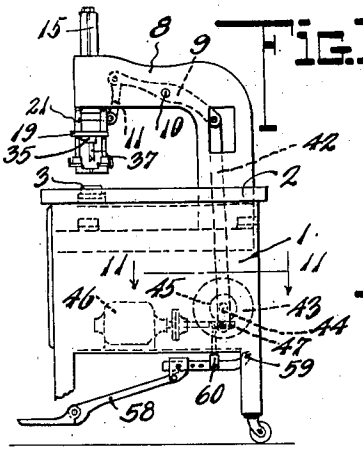


Fig. 11.

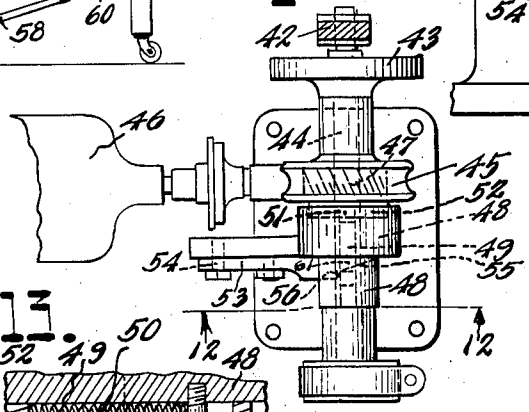


Fig. 12.

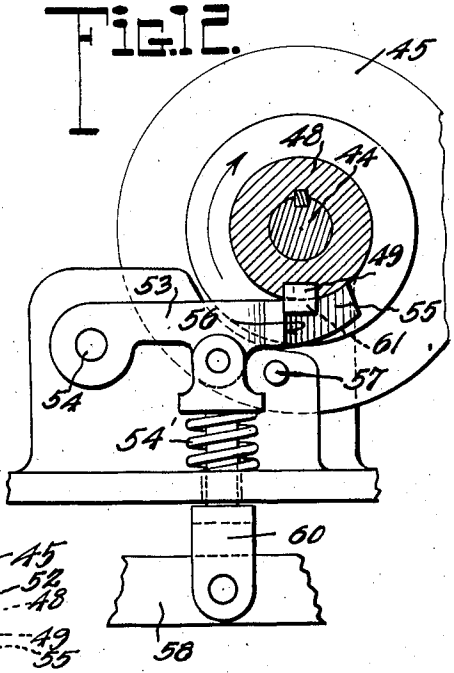
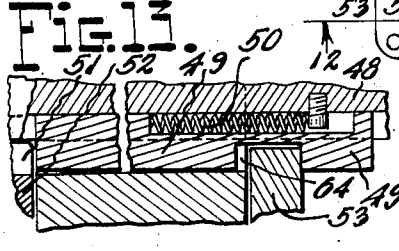


Fig. 13.



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Patented Apr. 28, 1936

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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR CUTTING FUR

Mary E. Rutter, Oil City, and Louis Rotter, Cambridge Springs, Pa.

Application September 21, 1935, Serial No. 41,600

12 Claims. (Cl. 164—47)

The present invention relates to improvements in method and apparatus for cutting fur and particularly to that type which functions to form what is known as a zig-zag line of cut.

It may be here noted that while it has been proposed heretofore to cut fur in this manner by machine, the universal practice today is to perform the operation by hand. In view of the importance of such operation, this work is done by experts who do practically nothing else. This has been the only way to satisfactorily produce a cut which does not injure the hair of the fur piece or the skin in such a way as would obviously prevent connecting together the pieces for a garment without showing the seam lines. Since the value of fur garments is particularly affected by the cutting operation when not properly done, it is highly important that it should be performed accurately, uniformly and with such precision that clipping of the fur or tearing or abnormally stretching the skin is avoided so that the points produced by the zig-zag cut of one skin will coincide in size and contour with those on the skin to be joined thereto. When the zig-zag cut is thus uniformly produced, the edges of the points may be readily fitted together and stitched by an overcasting machine without the necessity of stretching or distorting the said edges to make them meet properly.

It is to overcome these problems and the defects in the prior existing machines that we have devised the present improvement which includes as an important phase of the invention a novel method of cutting the skins by a plurality of blades in the use of which the cutting of one blade substantially opposes the cutting action of a companion blade, thereby preventing distortion and inaccuracy in the cutting operation.

One of the primary objects of our invention resides in the construction of a machine which is so arranged that the fur will be fixedly held over the knife gap without undue stretching or straining and which is provided with gripper or presser plates so mounted as to accommodate for uneven thicknesses of the fur at opposite sides of said gap.

A further object of the invention is to provide a power actuated machine of the type described which, upon actuation of a foot pedal, will automatically operate a cutter head and its associated parts to sequentially grip the fur in position to be cut, then cut the same, and finally strip the fur from the cutting instrumentalities without clipping the fibers or tearing the skin in any way.

A still further object in view is the provision of novel form and arrangement of cutting blades by means of which the special method of cutting fur above referred to may be carried out and independent blades may be replaced or sharpened as the necessity arises in this connection.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings:

Fig. 1 is a side elevation of the cutter head and base plate of a machine construction in accordance with our invention;

Fig. 2 is an enlarged view in front elevation of the cutter head and base plate of the machine;

Fig. 3 is a top plan view of the cutter head with its plunger support and arm omitted for the sake of clearness;

Fig. 4 is a top plan view of the base plate showing the upstanding fur holding pins or projections;

Fig. 5 is a detail elevation of companion or complemental cutting blades;

Fig. 6 is a fragmentary sectional view through the blades taken about on the plane of the line 6—6 of Fig. 2;

Fig. 7 is a vertical transverse sectional view on the line 7—7 of Fig. 2 looking in the direction of the arrows;

Fig. 8 is a sectional view on the line 8—8 of Fig. 7 showing more clearly the blade clamping means;

Fig. 9 is a horizontal sectional view on the line 9—9 of Fig. 7 showing in plan the presser plates for clamping the fur against the base plate;

Fig. 10 is a side elevation showing more or less diagrammatically the complete apparatus of this invention;

Fig. 11 is a detail sectional view taken on the line 11—11 of Fig. 10 and showing more clearly the motor drive and clutch control used in this apparatus;

Fig. 12 is a transverse sectional view on the line 12—12 of Fig. 11 showing more clearly the clutch means; and

Fig. 13 is a fragmentary sectional view taken on the line 13—13 of Fig. 12.

Like reference characters designate corresponding parts in the several figures of the drawings.

Referring to the drawings and specifically describing the invention, 1 designates a cabinet base or support for the operating mechanism of this apparatus, in the top 2 of which is suitably mounted the base plate 3 upon which the fur

is laid in the operation of cutting the same, said plate projecting slightly above the plane of the table or top 2.

As shown in Fig. 4, this base plate is of special form in that it has cut from its longitudinal center an elongated slot 5 which is of zig-zag form. Preferably this plate 3 is composed of two sections which are adjustably mounted upon the sub-plate 3' in any desired manner such as by means of clamping screws which pass through adjusting slots arranged transversely of the plate and by means of which the width of the slot in the base plate may be regulated.

A peculiar characteristic of the construction of the base plate 3 resides in the provision of spaced pinlike projections 6 arranged at opposite sides of the central slot so as to afford a gripping support for the fur which allows the hairs or fibers thereof to extend downwardly away from the skin and further permits these fibers to move out of the way of the cutting blades as they perform their cutting function in a manner hereinafter set forth.

More remote from the slot and at each side of the base plate 3 is a row of upstanding projections 7 having a greater area of gripping surface than afforded by the top surface of the pins 6.

The pins and these projections very firmly hold the fur when the latter is loosely placed upon the base plate and pressed thereagainst by the pressure means hereinafter described. It is to be further observed, referring further to Fig. 4 of the drawings, that the cutter blades pass through the slot 5 at the center of the same as shown in dotted lines in the figure so that there is no shearing effect produced as would be the case if said cutting instrumentalities cut against the walls of the slot.

Referring now more particularly to Figs. 2 ar 1 10, it will be observed that an overhanging supporting arm 8 projects upwardly and over the top of the cabinet base 1 and houses therein a beam or lever 9 which is pivoted intermediate its length at 10. A link 11 is connected at one end to an end of the lever 9 and at its other end to a collar 12. This collar surrounds a threaded boss 13 projecting upwardly from a plate 14 and said plate is connected to the vertical plunger 15 by means of a clamping bolt 16 which extends through said plunger into the boss 13.

As will be observed more particularly in Fig. 2 of the drawings, the plunger is of rectangular form and is mounted in the free end of the arm 8 for vertical sliding movement, being held in operative position on the arm 8 by means of the retaining plate 17 secured to the arm by the fastening members 18. To the bottom of the plate 14 is secured a guide plate 19, as by means of the stud screws 20 and said plate 19 has projecting upwardly therefrom adjacent each corner a tubular guide sleeve 21. These sleeves accommodate the slide rods 22, there being four of these in number, each of which is formed at its top with a reduced portion 23 to receive the stop collar 24 against which the sleeves are caused to be pressed by means of a spring 25 which is secured at its top to an offstanding extension 26' of the supporting collar 26. The collar 26 is clamped on the rod by the nut 27 and the opposite end of the spring 25 is connected to an ear 28 projecting upwardly from the guide plate 19.

It will of course be understood that a spring is provided for each guide rod and said springs tend to hold the guide plate 19 in its elevated position with the guide sleeves 21 pressing against the stop collars 24. The two front guide posts or rods are preferably connected by a bar 29 though it will be understood that such connection is not essential to the functioning of the device. As a matter of fact no connection is shown for the two rear guide posts although spacing members 30 are interposed between the spring supporting collars 26 and the stop collars 24 to correspond with the bar 29 so as to place the springs 25 under corresponding tension.

The guide plate 19 constitutes the mounting for the cutter device, which is to be described later, while the rods 22 constitute the mounting means for the presser plates which will now be more particularly described.

As shown in Figs. 2, 7 and 9, a presser plate 31 extends between the two front slide rods 22 and is connected thereto by means of the fastening screws 32, while a corresponding presser plate 31' is similarly connected to the rear pair of guide posts by fastening means 32'. These fastening means 32 and 32' preferably extend through elongated slots 33 and 33' so as to enable the adjustment of these plates toward or from each other to correspond with the similar adjustment of the base plate sections hereinbefore described.

As clearly shown in Fig. 9, the inner edge of each of the plates 31 and 31' is serrated or notched so as to produce a zig-zag slot 34 which corresponds with the zig-zag slot in the base plate.

Passing now to the cutter mechanism, to the bottom of the plate 19 is secured a cutter bar 35 as by means of fastening bolts 36, said bar being somewhat L-shaped in cross section as will be apparent from the illustration thereof in Fig. 7. The cutter bar along its blade receiving face is also notched so as to produce a zig-zag configuration and in each of these notches is removably mounted a pair of plates or cutters 37, more particularly shown in Fig. 5 of the drawings to be provided with a notch 38 near the top at one edge so as to receive a clamping bolt 39 which coacts with a clamping block 40 to hold a pair of these blades in place. Each of the vertical edges of the blades is beveled to provide at its lower extremity cutting edges, as indicated at 37' and each blade is also beveled at its bottom edge as indicated at 37a to produce a cutting or knife edge. This last mentioned edge inclines upwardly in a diagonal direction so as to form the penetrating point 41. The beveling of the contiguous edges of a pair of blades enables the fitting of said edges together in a right angle relationship as shown in Fig. 8 and the corresponding bevel of the outer edges produces a contacting fit betweeen the contiguous blades of each pair. This arrangement is particularly shown in Fig. 6 of the drawings and it will furthermore be observed both in Fig. 5 and Fig. 2 that the blades vary in length so that in the cutting operation the penetration of the respective blades takes place at varying times in the downward movement of the cutter bar. This is particularly advantageous in preventing the distortion of the skin or possible tearing thereof as would be incident to the use of blades of the same length.

It is further notable that with relation to the cutting edges 37a of the blades, speaking with respect to any one pair of the same, that the point 41 of one blade is located in the vertical plane of the apex of the triangular notch while the cutting point 41 of its companion blade is located at the base line of the notch. This is an important feature of our invention in that dur-

ing the cutting action of the blades one of said blades cuts toward the apex while its companion blade cuts away from the apex of the serration. In this manner, the points produced by the cutting action of the cutter device are formed without likelihood of tearing the skin, the defect which occurs in those prior devices where the blades are so arranged that the cut is made from the apex of the points toward the base.

It will be obvious from the foregoing description that any one of the blades in the cutter head may be removed for sharpening purposes or for replacement in the event of breakage and the assembly of the blades in the manner above specified will insure the zig-zag cutting of the fur with a uniform pitch or angle to the serrations. This enables any two pieces of fur to be connected together and the zig-zag edges will naturally match so that the machine operator has only to hold the corresponding edges of the two pieces of fur together to enable the stitching to be performed by the machine and little or no skill is required in the operation.

Passing now to the operation of the cutter head assembly, it will be understood that when the beam 9 is rocked about its pivot by mechanism to be hereinafter described, the link 11 and its connecting collar will press downwardly upon the cutter head which moves as a unit and is guided by the plunger 15 in such movement until the presser plates 31, 31' contact with the skin side of the fur, which is laid upon the base plate loosely with the fur side down, all as shown in dotted lines in Fig. 7. A sufficient amount of pressure at a large number of points on the fur adjacent to the slot in the base plate by the presser plates is thus provided to firmly hold the skin or fur without distortion. Continued downward movement of the plunger now causes the guide plate 19 to move downwardly against the tension of the springs 25, carrying with it the cutter bar until the knives mounted therein reach the skin and penetrate the same in the manner hereinbefore specifically described. Each knife performs its cutting action in a substantially opposed direction with respect to its companion knife and in this manner the zig-zag cut is produced quickly and accurately.

Upon the completion of the downward movement the cutter head is caused to be elevated by the reverse movement of the actuating collar 12, the knives being withdrawn from the fur which is stripped from said knives by the presser plates as the guide sleeves 21 move upwardly on the slide rods 22. When the sleeves abut with the stop collars 24 movement of the presser plates in an upward direction begins under the lifting action produced by the lever 9, thus normalizing the cutter head assembly which assumes the elevated position shown clearly in Fig. 2.

It should be noted that in the operation of cutting the fur as above described the construction of the base plate permits the free movement of the hair or fibers as the blades pass through the skin so as to insure against clipping of the fibers by said blades.

It is to be understood that any desired means may be employed for the purpose of operating the cutter head mechanism hereinbefore specifically described and we do not wish to be restricted in this respect. However, as illustrating one embodiment of actuating mechanism to be associated with the cutter mechanism referred to, reference is now made to Figs. 10 to 13.

In the illustrated actuating means for operating the cutter head, 42 designates a connecting rod which is connected to the beam 9 at one end and has its other end connected to the crank member 43 fixed to a horizontal shaft 44. The shaft is suitably journalled in the cabinet 1 and has freely rotatable thereon a worm gear 45, said worm gear being driven by the motor 46 through a worm 47. The shaft 44 has keyed thereon a collar 48 in which is slidably disposed a clutch key 49. An engaging spring 50 is provided for shifting the key into clutching engagement with a notch 51 in a boss extension 52 formed on the worm gear 45. When this key member moves into engagement with the hub portion, the constantly rotating worm will, under these conditions, cause the shaft 44 carrying the crank disk 43 to be rotated. A release or cam lever 53 is provided for disengaging the key 49, this lever being pivoted at 54 and normally urged upwardly by the spring 54'.

The free end of this lever is formed with a cam portion 55 and a stop shoulder 56. A stop pin 57 is fixed on the lever support below the lever to limit the downward movement thereof. The operating means for this lever comprises a foot actuating lever 58 pivoted at 59 and having a link member 60 connected to the lever 53. As a matter of detail, the key 49 is provided with a notch 61 in which the extremity of the lever 53 is adapted to operate to shift the key outwardly from engagement with the worm gear 45.

It will be apparent that upon depressing the foot pedal 58, the lever 53 will be swung downwardly against the stop pin 57, thereby releasing the key to permit of its engagement under the influence of the spring 50 with the worm gear 45. This worm being then operated by the motor 46 causes the shaft 44 to move the crank disk 43 and connecting rod 42, causing the shaft to rotate the disk and move the connecting rod 42 upwardly, thereby lowering the cutter head in the manner which has hereinbefore been described with reference to the cutter head mechanism.

The operator now releases the foot pedal whereupon the spring 54' reases the lever 53 so that the cam portion 55 is disposed in the path of the key and as the shaft rotates the cam will withdraw the key from its engagement with the worm gear 45 and upon engagement of the face of the key with the stop portion 56 arrest rotation of the shaft and its crank disk.

While the specific details of construction have been herein shown and described, the invention is not confined thereto as alterations may be made without departing from the spirit thereof as defined by the appended claims.

We claim:

1. In a fur cutting machine of the class described, the combination of a base plate upon which the fur is adapted to be placed, a cutter head assembly supported in spaced relation thereto and including a cutter bar, clamping members for clamping the fur upon opposite sides of the line of cut, supporting means on said head for said clamping members, yieldable means connected to said cutter bar and supporting means permitting relative movement of the clamping members and cutter bar, and means for actuating the cutter bar and the clamping means through the yieldable means aforesaid to effect clamping of the fur and sequential cutting of the same.

2. In a fur cutting machine of the class described, the combination of a base plate upon which the fur is adapted to be placed, a cutter head assembly supported in spaced relation

thereto and including a cutter bar, independent clamping members at each side of the cutter bar for clamping the fur upon opposite sides of the line of cut, yieldable means connected to the clamping members and said cutter bar, and means for lowering the cutter head to effect clamping of the fur, said yieldable means permitting the cutter bar to continue downward movement when the clamping means is in clamping position whereby to effect cutting of the fur while so held.

3. In a fur cutting machine of the class described, the combination of a base plate upon which the fur is adapted to be placed, a cutter head assembly supported in spaced relation thereto and including a cutter bar, independent clamping members at each side of the cutter bar for clamping the fur upon opposite sides of the line of cut, yieldable means connected to the clamping members and said cutter bar, and means for lowering the cutter head to effect clamping of the fur, said yieldable means permitting the cutter bar to move after the clamping means is in clamping position whereby to effect cutting of the fur and also maintaining the clamping means in operative position after the cutting operation and while the cutter bar is again raised, whereby to strip the fur from the cutting means.

4. In a fur cutting machine of the class described, the combination of a base plate upon which the fur is adapted to be placed, a cutter head assembly supported in spaced relation thereto and including a cutter bar, a clamping bar at each side of the cutter bar, supporting means for said clamping bars carried by the cutter bar, and means for tensioning said clamping bars through the cutter bar to produce clamping pressure while the cutter bar is operating to effect cutting action.

5. In a fur cutting machine of the class described, the combination of a base plate upon which the fur is adapted to be placed, a cutter head assembly supported in spaced relation thereto and including a cutter bar, a clamping bar at each side of the cutter bar, supporting means for said clamping bars carried by the cutter bar, and means for tensioning said clamping bars through the cutter bar to produce clamping pressure while the cutter bar is operating to effect cutting action, said means being arranged to permit independent action of the cutter bars whereby to accommodate for different thicknesses of the fur at the opposite sides of the line of cut.

6. In a fur cutting machine of the class described, the combination of a base plate upon which the fur is adapted to be placed, a cutter head assembly supported in spaced relation thereto and including a cutter bar, a supporting plate to which the bar is connected, guide sleeves carried by said supporting plate, guide rods extending through said sleeves, clamping plates connected to the lower ends of said guide rods, and springs connected to the cutter bar supporting plate and the guide rods for tensioning the clamping plates incident to cutting movement of the cutter bar.

7. In a fur cutting machine of the class described, the combination of a support, a cutter head assembly movably connected thereto, and a plunger member for sustaining and guiding the cutter head in vertical movements thereof, said head including a cutter bar having a plurality of cutting blades mounted thereon in angular relation to each other, each blade having a cutting edge disposed at an angle to the horizontal, the cutting edges of each pair of blades being arranged to cut to and away from a common point in the cutting operations whereby to form a zig-zag cut.

8. A cutter bar for fur cutting machines, comprising a bar having one edge formed with triangular notches, and a plurality of cutter blades connected to the angle faces of said notches, said pair of blades having corresponding cutting edges inclining upwardly so as to effect a cutting action to and from a common point along angular lines.

9. A cutting blade for fur cutting machines comprising an elongated blade having its longitudinal edges beveled to provide contacting faces when a plurality of said blades are arranged in angular relation to each other, and a cutting edge beveled at one side and forming an obtuse angle to the leading longitudinal edges of the blade.

10. The method of cutting furs which comprises passing a blade through the skin toward a point and simultaneously passing a second blade through the skin at said point and away from the same along a line at an angle to the line of cut of the first mentioned blade.

11. The method of cutting furs with zig-zag edges which comprises cutting through the skin along intersecting lines by means of knives arranged to cut simultaneously and in directions toward and from the points of intersection forming the zig-zag.

12. Cutting means for cutting furs comprising blade members constructed in accordance with claim 9, each pair of blades at the meeting edges having complemental notches to receive fastening means for holding said blades in cooperative relation.

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