

(No Model.)

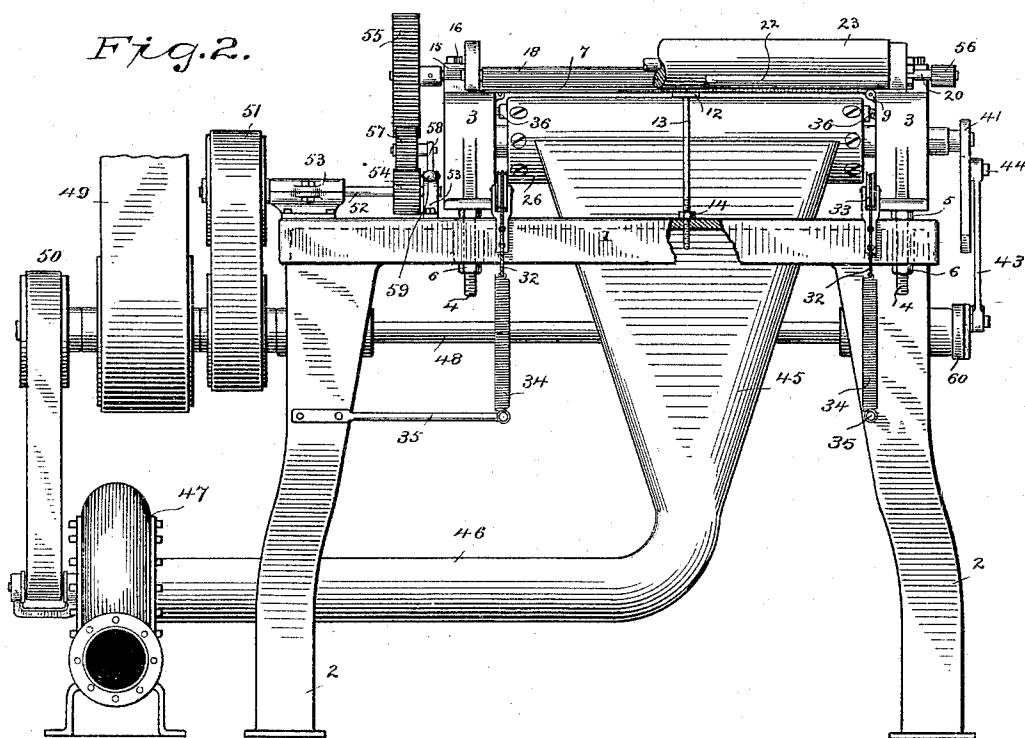
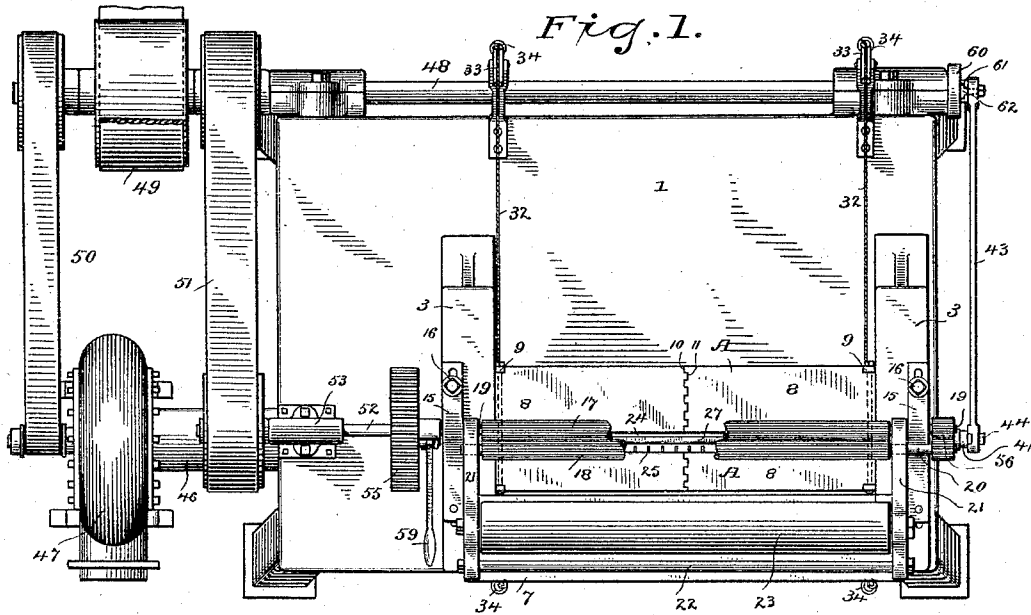
3 Sheets—Sheet 1.

F. J. MURPHY.

MACHINE FOR PLUCKING HAIRS FROM SKINS.

No. 487,349.

Patented Dec. 6, 1892.



WITNESSES

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(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

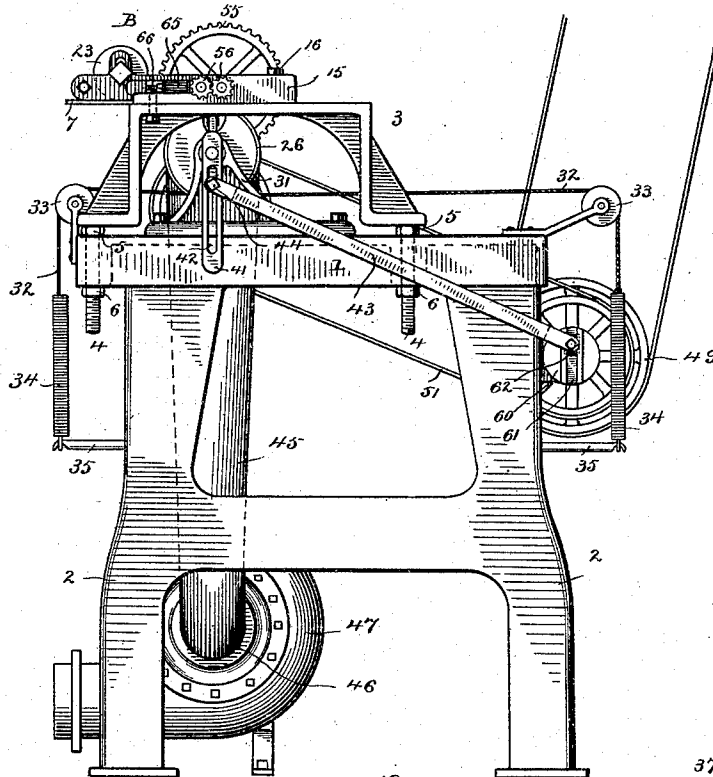


Fig. 5.

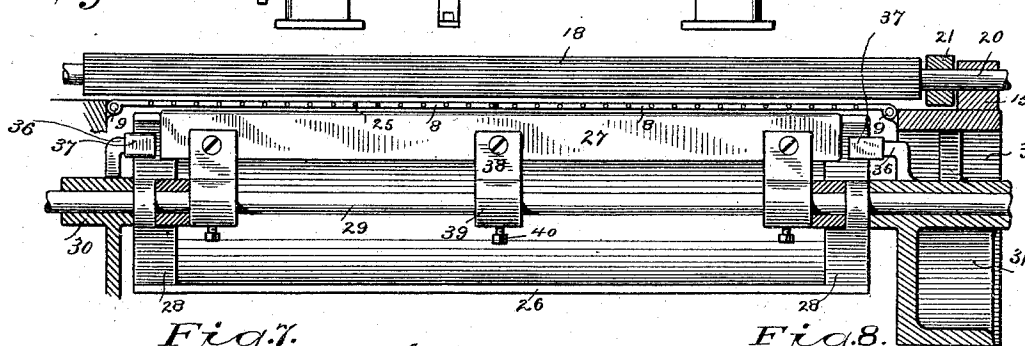


Fig. 7.

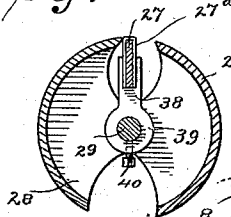


Fig. 6.

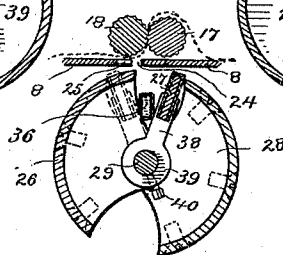
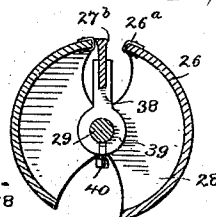


Fig. 8.



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Fig. 4.

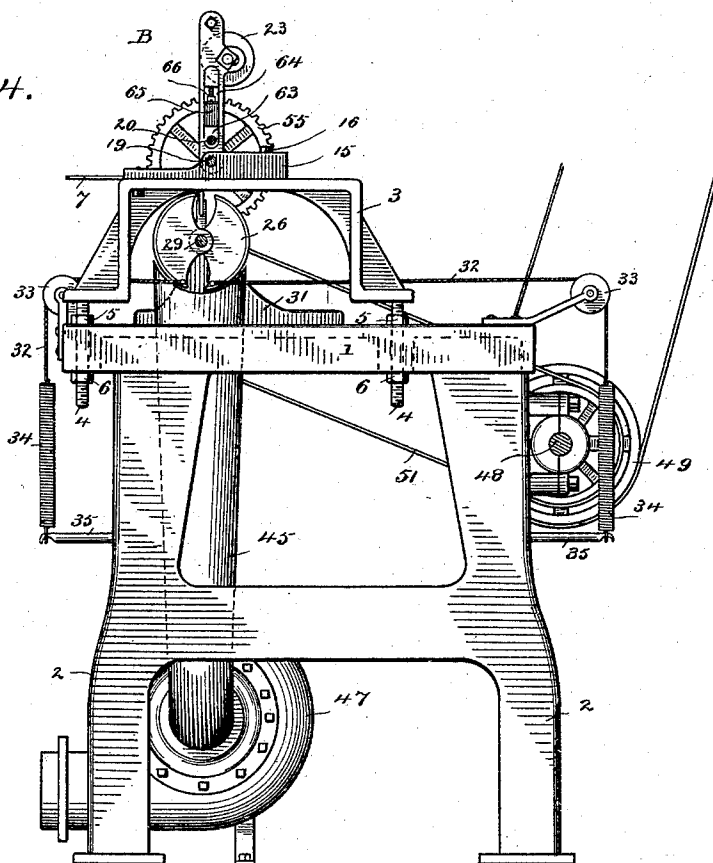
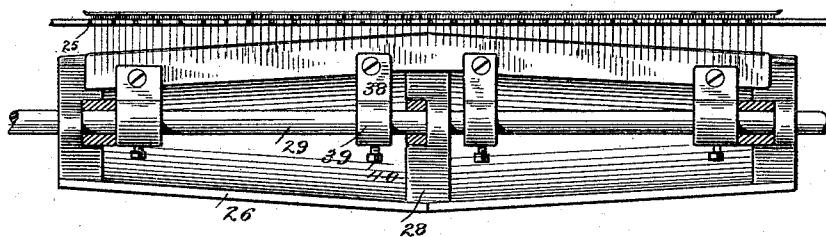


Fig. 9.



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UNITED STATES PATENT OFFICE.

FRANK J. MURPHY, OF DANBURY, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO ANTHONY M. RUNDLE, OF SAME PLACE.

MACHINE FOR PLUCKING HAIRS FROM SKINS.

SPECIFICATION forming part of Letters Patent No. 487,349, dated December 6, 1892.

Application filed January 22, 1892. Renewed November 5, 1892. Serial No. 451,101. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. MURPHY, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Plucking Hairs from Skins; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to produce a machine that will effectually and rapidly remove long hairs from skins. It is of course well understood that the fur of most animals—as, for example, the seal or nutria—contains long hairs which require to be plucked from the skin before the fur is removed therefrom—as, for example, in the manufacture of hats, in which it is absolutely necessary that all hairs and impurities be removed from the fur and also in most instances where the skins—as, for example, seal-skins—are used in making garments. Heretofore, so far as I am aware, this operation has been performed entirely by hand, no machine having been produced capable of plucking the hairs from the skins of different classes of fur-bearing animals. By the use of my present machine the skins simply require to be dampened sufficiently to soften them and then passed through the machine, when they are ready for the operation of shaving or otherwise removing the fur or for the various operations of cleaning, dyeing, &c., when the skins are used in making garments.

With these ends in view I have devised the novel machine, of which the following description in connection with the accompanying drawings is a specification, numbers being used to designate the several parts.

Figure 1 is a plan view of the machine complete; Fig. 2, a side elevation thereof; Fig. 3, an end elevation as seen from the right in Figs. 1 and 2, the hinged frame being in operative position; Fig. 4, a similar view, the hinged frame being swung up out of operative position and the connecting-rod and parts operating in connection therewith be-

ing removed; Fig. 5, a detail sectional view, on an enlarged scale, showing one of the feed-rollers, the tongue, and the ends of one of the gripping-plates in elevation; Fig. 6, a transverse section of the feed-rollers, adjustable platforms, gripping-plates, tongue, &c., showing the tongue in full lines when at its farthest position toward the right and in dotted lines when its operative movement has been stopped after the hair has been plucked from the skin by movement toward the left; Fig. 7, a similar view, the feed-rollers and platforms being omitted, showing the position of the tongue and gripping-plate at the instant the hair is gripped between them by movement of the tongue toward the left. Fig. 8, a similar view illustrating slight changes in the details of construction; and Fig. 9 is a view corresponding substantially with Fig. 5, illustrating a form in which the tongue and gripping-plate are both inclined downward in both directions from the center and in connection with which flat platforms are ordinarily used instead of platforms inclining downward in both directions from the center.

1 denotes the bed, which is supported by legs 2.

3 denotes brackets, which have formed in tegral therewith or rigidly secured thereto threaded rods 4. These rods extend through the bed and ordinarily through bosses on the under side thereof.

5 denotes nuts upon the threaded rod, which lie above the bed, and 6 nuts upon said rod below the bed. By loosening these nuts the brackets may be raised or lowered for a purpose presently to be explained, and then locked in position after adjustment by tightening up the nuts. Figs. 3 and 4 show different adjustments of these brackets.

7 denotes a plate the opposite ends of which are secured to the brackets over which the skins pass in use.

A denotes adjustable platforms, each consisting of two plates 8, the outer ends of which are hinged to the brackets, as at 9, the inner ends being preferably provided with alternate projections 10 and depressions 11, which engage each other, as shown. The ad-

justable platforms are supported at the center by plates 12, carried by rods 13. The lower ends of these rods are threaded and pass through the bed. The center of the platforms may be raised or lowered, as may be required, by raising or lowering the plates and rods, after which the rods are locked in position by nuts 14. This adjustment is rendered necessary by the fact that the hairs on certain portions of fur-bearing skins are of uneven length, the hair being longest on the backs of some animals and on the bellies of other animals, the practice in removing the skins being to open them through the portion of the skins having the longest hairs, so that in the condition in which the skins are operated upon by the machine the longest hairs are in all cases at the outer edges of the skin. As an alternate form I have illustrated in Fig. 9 a construction in which the tongue and gripping-plates are made highest at the center, from which point the gripping-surfaces incline downward in both directions. In this form the adjustable platforms may be dispensed with, ordinary flat plates or platforms serving the purpose just as well.

24 denotes a slot between the two platforms, through which the hairs to be plucked pass when the machine is in use. The edge of one of the platforms—the one over which the skin passes before it reaches the feed-rollers—is provided with prongs 25, which support the skin, but allow the long hairs to pass down between the platforms, as will be more fully explained.

15 denotes adjustable bearing-plates secured to the upper side of brackets 3. These bearing-plates are secured in place by bolts 16, one bolt for each plate passing upward through a slot in the bracket and engaging the plate, the other passing downward through a slot in the plate and engaging the bracket.

17 and 18 denote feed-rollers, ordinarily corrugated, as shown in the drawings. The shaft 19 of roller 17 is journaled in bearing-plates 15, and the shaft 20 of roller 18 is journaled in arms 21, the inner ends of which are pivoted on shaft 19. The outer ends of arms 21 are supported and braced by a cross-piece 22, said arms and cross-piece constituting a hinged frame, which as a whole I have designated as B. In addition to carrying feed-roller 18, this frame also carries a roller 23, which rests upon the skin in use and acts to hold it down and press it out flat. As it is necessary that one of the feed-rollers should be so carried as to yield sufficiently to adapt the machine to different grades and qualities of skins, I preferably journal the shaft 20 of feed-roller 18 in blocks 63, which lie in grooves 64 in arms 21, said blocks being held in operative position by springs 65, which may be coil-springs or blocks of rubber; as shown in the drawings. 66 denotes screws for adjusting the tension of the springs.

The plucking mechanism lies under the ad-

justable platforms at slot 24 and consists of suitable gripping-jaws ordinarily, either one or two oscillating plates (denoted by 26) acting in connection with a tongue 27. The oscillating plates may be of any suitable shape, but are preferably curved, as shown in the drawings, as will be more fully explained, and are provided with webs 28, which are pivoted on a rock-shaft 29, the pivotal portions of the webs being preferably recessed into each other, as shown in Fig. 5. Rock-shaft 29 is supported in bearings 30 upon brackets 31, which are bolted to the bed. The webs carrying the oscillating plates are free to turn on the shaft, but are held in position by cords 32, (shown as extending over pulleys 33 and connected to strong springs 34,) the other ends of the springs being connected to a fixed portion of the machine—for example, to arms 35, as shown in the drawings.

36 denotes stops upon brackets 31, said stops being engaged by the webs and acting to limit the movement of the oscillating plates through the pull of the springs. These stops may or may not be provided with rubber pads 37, as shown in Fig. 5. Tongue 27 is carried by arms 38. These arms are provided with hubs 39, through which the shaft passes, and are locked to the shaft by set-screws 40 or in any suitable manner.

In Figs. 6 and 7 I have shown the tongue as faced on both sides with a rubber pad 27^a, and in Fig. 8 have shown the edges of the oscillating plates as provided with rubber pads 26^a. In this form the outer end of the tongue is preferably made wider than the body thereof, so as to form gripping-surfaces 27^b. At one end of rock-shaft 29 is an arm 41, which is rigidly secured thereto and is provided with a slot 42.

43 is a connecting-rod, one end of which is adjustably secured to the arm by means of a bolt 44, which engages the slot.

45 is a funnel under the plucking mechanism from which a pipe 46, extends to an exhaust-fan 47, by which the hair plucked from skins is drawn from the machine and carried away. It will be seen (see Figs. 2, 3, and 4) that by curving the oscillating plates, as shown, said plates in connection with the webs at the ends are made to practically close the funnel with the exception of the openings at top and bottom between the plates themselves. This insures that the entire strength of the exhaust-fan shall be utilized to draw the hairs down through slot 24 into position to be acted on by the gripping-jaws and that after the hairs have been plucked from the skin they shall be instantly carried away by means of pipe 46 and the fan.

48 is the main shaft of the machine, to which power is applied by a belt 49.

50 is a belt extending from a pulley on the main shaft to a pulley on the shaft of the exhaust-fan, and 51 a belt extending from another pulley on the main shaft to a pulley on

a shaft 52, which is journaled in bearings 53 upon the bed. At the inner end of shaft 52 is a pinion 54.

55 denotes a gear on shaft 19 of feed-roller 17. The opposite ends of shafts 19 and 20 are provided with pinions 56, which mesh with each other and by which power is transmitted from one feed-roller shaft to the other. Power is communicated from pinion 54 to gear 55 by means of an intermediate gear 57, which is carried by an angle-lever 58, pivoted on the inner bearing 53. The end of the long arm of the angle-lever is provided with a hand-piece 59, the weight of which is sufficient to hold the intermediate gear out of operative position when it has been moved outward past the pivotal point of the angle-lever, the weight of the intermediate gear itself acting to hold it in operative position when it has been moved inward again past the pivotal point of the angle-lever. It will be seen, therefore, that to start or stop the feed-rollers at any time it is simply necessary to operate the angle-lever and move the intermediate gear out of or into operative position. 60 is a disk at the end of shaft 48, which is provided with an undercut groove 61, in which is an adjustable block 62, to which one end of connecting-rod 43 is pivoted, the other end of said rod being connected to arm 41 on the rock-shaft.

The operation is as follows: In starting, the hinged frame is swung up out of operative position, as in Fig. 4, and the end of a skin introduced between the feed-rollers, the hair side being downward, the skin having been previously dampened sufficiently to render it soft and pliable. The hinged frame is then dropped down to operative position, as in Fig. 3, roller 23 lying upon the skin and holding it down and pressed out flat. Brackets 3 and the platforms, having been once adjusted to a certain grade of skins, do not require to be changed in ordinary use. When the hair upon the skins is unusually long, brackets 3, which carry the feed-rollers and hinged frame, are raised in the manner described, Fig. 4 showing the brackets raised somewhat, and Fig. 3 showing them at their lowest position. Should the hairs be considerably longer at the edges of the skin than at the center, the difference is compensated for by raising the centers of the adjustable platforms. As soon as the hinged frame has been swung down into operative position, intermediate gear 57 is placed in engagement with pinion 54 and gear 55, thereby imparting motion to the feed-rollers. The skin is drawn under feed-roller 18, then up between the feed-rollers, and passed backward over roller 17, as indicated in Fig. 6, in which the skin is indicated by a dotted line. As the skin is drawn forward by the feed-rollers the hairs are drawn down through slot 24 by the exhaust-fan into position to be gripped between one of the oscillating plates and the tongue, said

parts constituting a pair of gripping-jaws, which are shown in the open position in Fig. 6. The oscillation of the rock-shaft by means of connecting-rod 43 and arm 41 causes the tongue to be moved against the oscillating plate, so that the hairs are seized between the jaws—i. e., the oscillating plate and tongue—the position of the parts at the instant the hairs are gripped being shown in Fig. 7. The continued oscillation of the rock-shaft in that direction moves the tongue still farther toward the left, as seen in dotted lines in Fig. 6, the skin being at the same time drawn forward by the feed-rollers, so that the hairs that have been caught between the jaws are plucked from the skin, it being understood, of course, that the backward movement of the oscillating plate is against the power of springs 34, which act to return it to its normal position as soon as the tongue begins to move backward. The extreme backward position of the oscillating plate, to which it is carried by the forward movement of the tongue, is indicated by dotted lines in Fig. 6. The return movement of the rock-shaft carries the tongue back to the position shown in full lines in Fig. 6, the oscillating plate following it through the power of the springs until it is stopped by the engagement of web 28 with stop 36.

In Fig. 4 I have shown both of the oscillating plates 26 as connected by cords to springs 34, the action of which is to return the oscillating plates to their normal position after the plucking operation. Upon some kinds of skins and under certain circumstances I prefer to use both oscillating plates and to have a gripping operation performed by the tongue in connection with the left oscillating plate when the tongue is moving toward the left, and in connection with the right oscillating plate when the tongue is moving toward the right.

It will be understood, of course, that the gripping movement toward the left is performed against the feed-rollers—that is to say, the hairs are gripped and twitched in one direction while the feed-rollers are acting to move the skin in the opposite direction—but that the plucking movement toward the right is made in the same general direction that the skin is being moved by the feed-rollers. For this reason upon the ordinary run of skins I disconnect the right oscillating plate from the springs 34 upon that side of the machine and retain it in substantially the position shown in the drawings by any suitable stop, which I have not deemed it necessary to illustrate in the drawings.

One or both oscillating plates may be used in the form shown in Fig. 9, the same as in the other form.

In Figs. 6 and 7 I have shown the tongue as provided with a rubber pad 27^a, which yields slightly and insures that the hairs be held firmly.

In Fig. 8, I have shown a form in which pads 26^a are placed at the edges of the oscillating plates and the tongue as provided with outwardly-curved gripping-surfaces 27^b, which
 5 act in connection therewith. I have used both forms in practice and find that both work satisfactorily. I have also shown stop 36 as provided with a pad 37, so as to prevent any perceptible shock when either of the webs 28
 10 comes in contact with the stop.

Having thus described my invention, I claim—

1. The combination, with suitable framework and feeding mechanism, of platforms by
 15 which the skins are supported, said platforms having a slot 24 between them, gripping-jaws underneath the slot, and suitable means for operating the gripping-jaws to pluck hairs from skins.

20 2. The combination, with suitable framework and feeding mechanism, of platforms by which the skins are supported, said platforms having a slot between them and prongs extending partially across said slot from one of
 25 the platforms which support the skin but permit the hairs to pass through, gripping-jaws underneath the slot, and suitable means for operating said jaws.

30 3. The combination, with suitable framework and feeding mechanism, of hinged plates 8, having slot 24, means for raising and lowering said plates at the center for the purpose set forth, gripping-jaws underneath the slot, and suitable means for operating said jaws.

35 4. The combination, with suitable framework and feeding mechanism, of plates 8, having slot 24 and hinged at their outer ends, the inner ends of said plates engaging, substantially as described and shown, rods 13 and
 40 nuts 14, by which said plates may be raised or lowered at the center, gripping-jaws underneath the slot, and suitable means for operating said jaws.

45 5. The combination, with the framework, plates 8, having slot 24, and the gripping-jaws, of hinged frame B, the feed-rollers, and roller 23, carried thereby.

6. The combination, with the framework, plates 8, having slot 24, and the gripping-jaws,
 50 of hinged frame B, the feed-rollers and roller 23, carried thereby, movable blocks in said frame, in which one of the feed-rollers is journaled, springs 65, bearing against the blocks, and screws for adjusting the tension of the
 55 springs so as to regulate the grip of the feed-rollers upon the skin.

7. The combination, with suitable framework, plates 8, having slot 24, and gripping-jaws beneath the plates, of the hinged frame,
 60 the feed-rollers carried thereby, one of which is provided with a gear 55, gear 54, means for imparting rotation thereto, and an intermediate gear 57, carried by an angle-lever, which is adapted to be thrown into or out of engage-
 65 ment with gears 54 and 55, whereby motion is

communicated to the feed-rollers or their rotation is stopped.

8. The combination, with the framework, plates 8, having slot 24, and the gripping-jaws, of hinged frame B, the feed-rollers carried thereby, brackets 3, to which said frame
 70 is hinged, and suitable means for raising and lowering said brackets relatively to the gripping-jaws.

9. The combination, with the framework, 75 plates 8, having slot 24, and the gripping-jaws, of the hinged frame, brackets 3, bearing-plates 15, adjustable on said brackets, the hinged frame, and the feed-rollers, one of which is journaled in the adjustable bearing-
 80 plates, the other being journaled in the hinged frame.

10. The combination, with the framework, plates 8, having slot 24, and the gripping-jaws, of the hinged frame, the feed-rollers, 85 shafts 19 and 20, by which they are carried, and adjustable bearing-plates 15, in which shaft 19 is journaled, said hinged frame turning freely on said shaft and shaft 20 of the other feed-roller being journaled in said
 90 frame.

11. The combination, with the framework, plates 8, having slot 24, and the gripping-jaws, of the feed-rollers, shafts 19 and 20, by which they are carried, and adjustable bearing-plates 15, in which shaft 19 is journaled,
 95 said hinged frame turning freely on said shaft and shaft 20 of the other feed-roller being journaled in said frame, both of said shafts being provided with pinions whereby motion is communicated from one to the other
 100 and one of said shafts having a gear 55, by which motion is imparted thereto.

12. The combination, with the framework, the feed-rollers, and plates 8, having slot 24,
 105 of rock-shaft 29, oscillating plate 26, mounted on said shaft, a cord and spring for holding said plate in its normal position, a stop for limiting its forward movement, and a tongue carried by the rock-shaft, which acts in
 110 connection with the oscillating plate to pluck hairs from the skins.

13. The combination, with the framework and feed-rollers, of the rock-shaft, a tongue carried thereby, an oscillating plate mounted
 115 on said shaft, and means, as a spring, for holding the oscillating plate in its normal position and keeping it in contact with the tongue in the act of gripping.

14. The combination, with the framework 120 and the feed-rollers, of the rock-shaft carrying the tongue, an oscillating plate mounted on the rock-shaft and acting in connection with the tongue, means, as a spring, for holding said oscillating plate in its normal position,
 125 a similarly-shaped plate on the opposite side of the tongue, and a funnel and exhaust-fan whereby hair plucked from the skin by the gripping-jaws is carried away.

15. The combination, with the framework 130

and the feed-rollers, of the rock-shaft, a
tongue carried thereby, an oscillating plate
mounted on the rock-shaft, a spring for hold-
ing said oscillating plate in operative posi-
5 tion, an arm attached to said rock-shaft, and
a connecting-rod engaging the arm, whereby
motion is imparted to said rock-shaft.

16. The combination, with the framework
and the feed-rollers, of the rock-shaft, a
10 tongue carried thereby and having a pad

27^a, the oscillating plate, and a spring and
cord for holding the latter in operative posi-
tion.

In testimony whereof I affix my signature in
presence of two witnesses.

FRANK J. MURPHY.

Witnesses:

LEVI K. MANSFIELD,
NATHAN T. BUCKLEY.