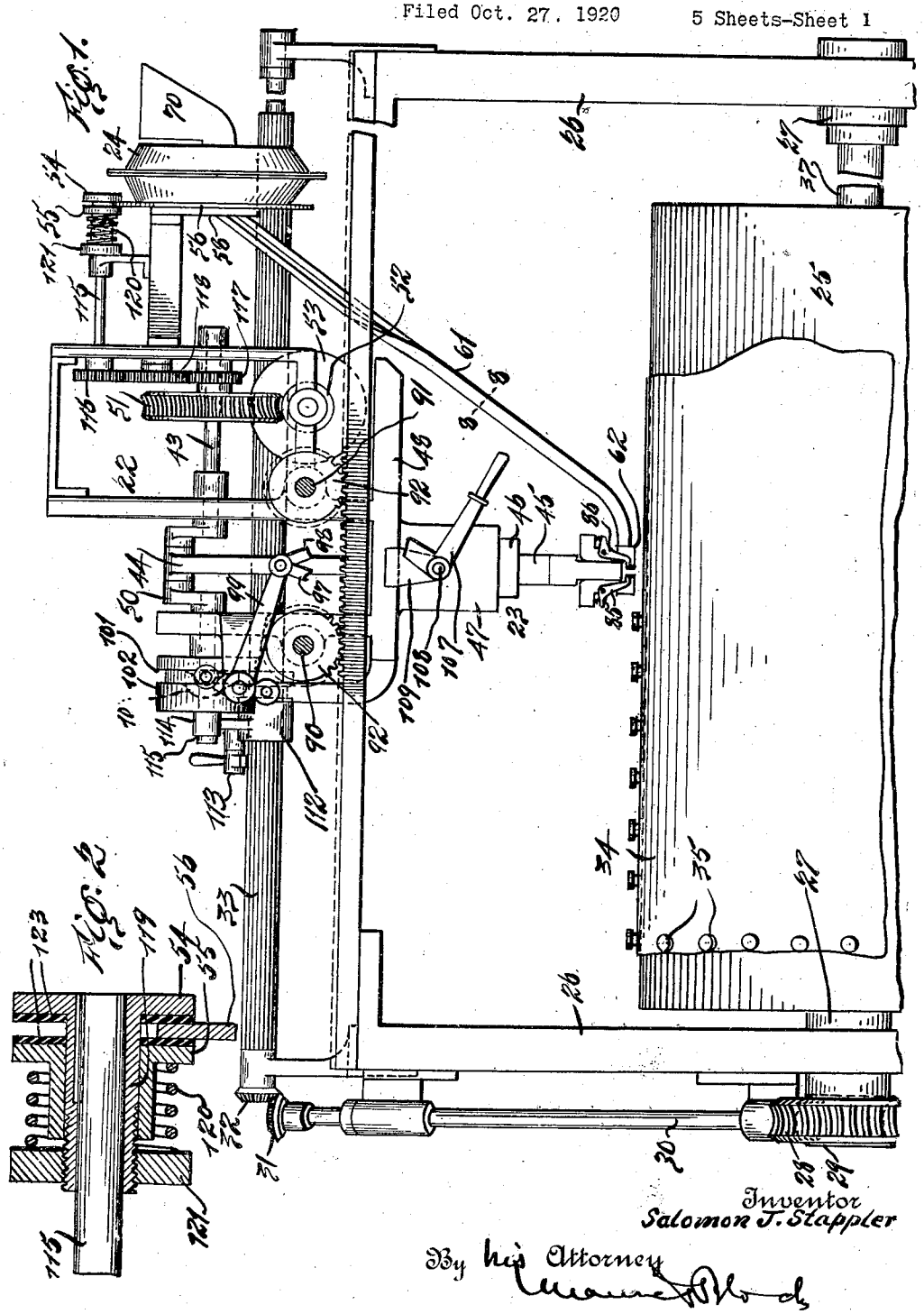
April 1, 1924. 1,488,563

S. J. STAPPLER

SKIN NAILING MACHINE

Filed Oct. 27, 1920 5 Sheets-Sheet 1



Inventor
Salomon J. Stappler

By his Attorney

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S. J. STAPPLER

SKIN NAILING MACHINE

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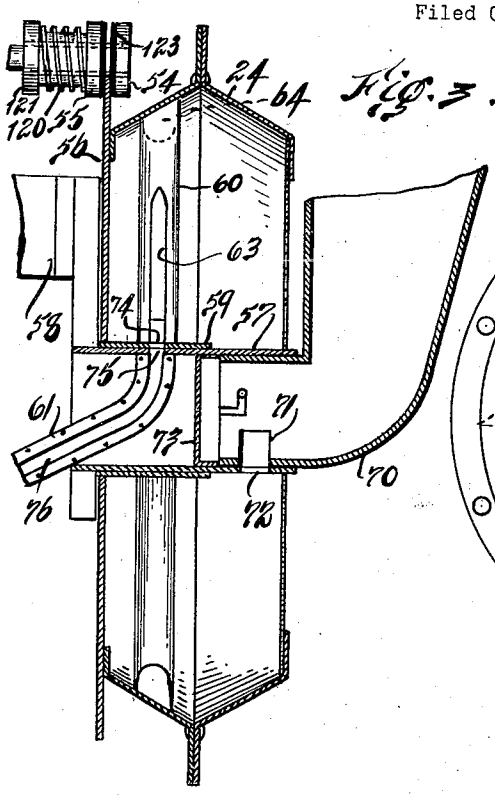


Fig. 3.

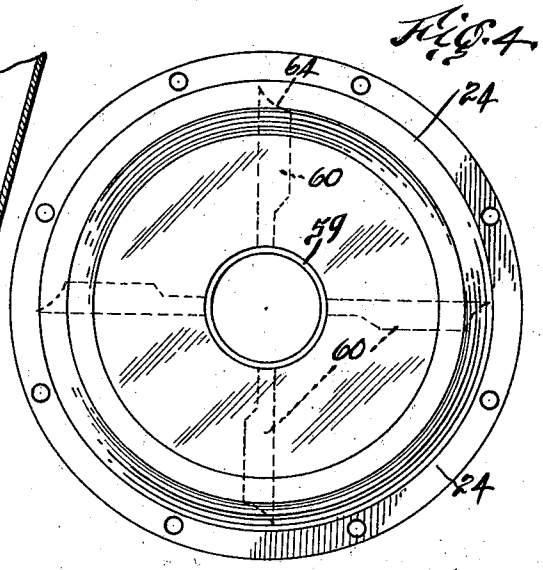


Fig. 4.

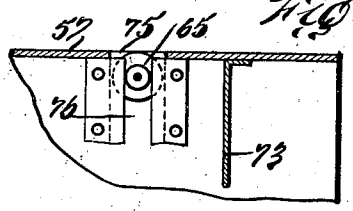


Fig. 5.

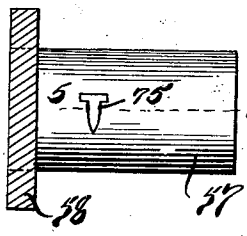


Fig. 6.

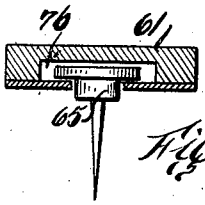


Fig. 8.

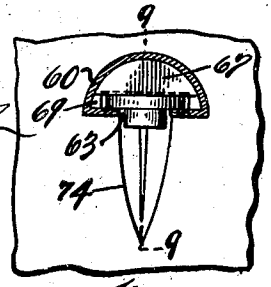


Fig. 7.

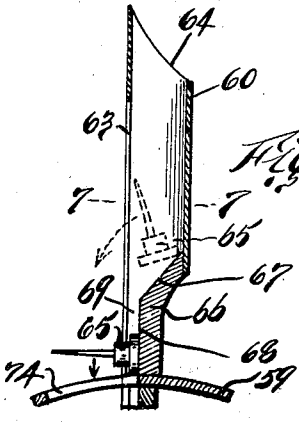


Fig. 9.

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SKIN NAILING MACHINE

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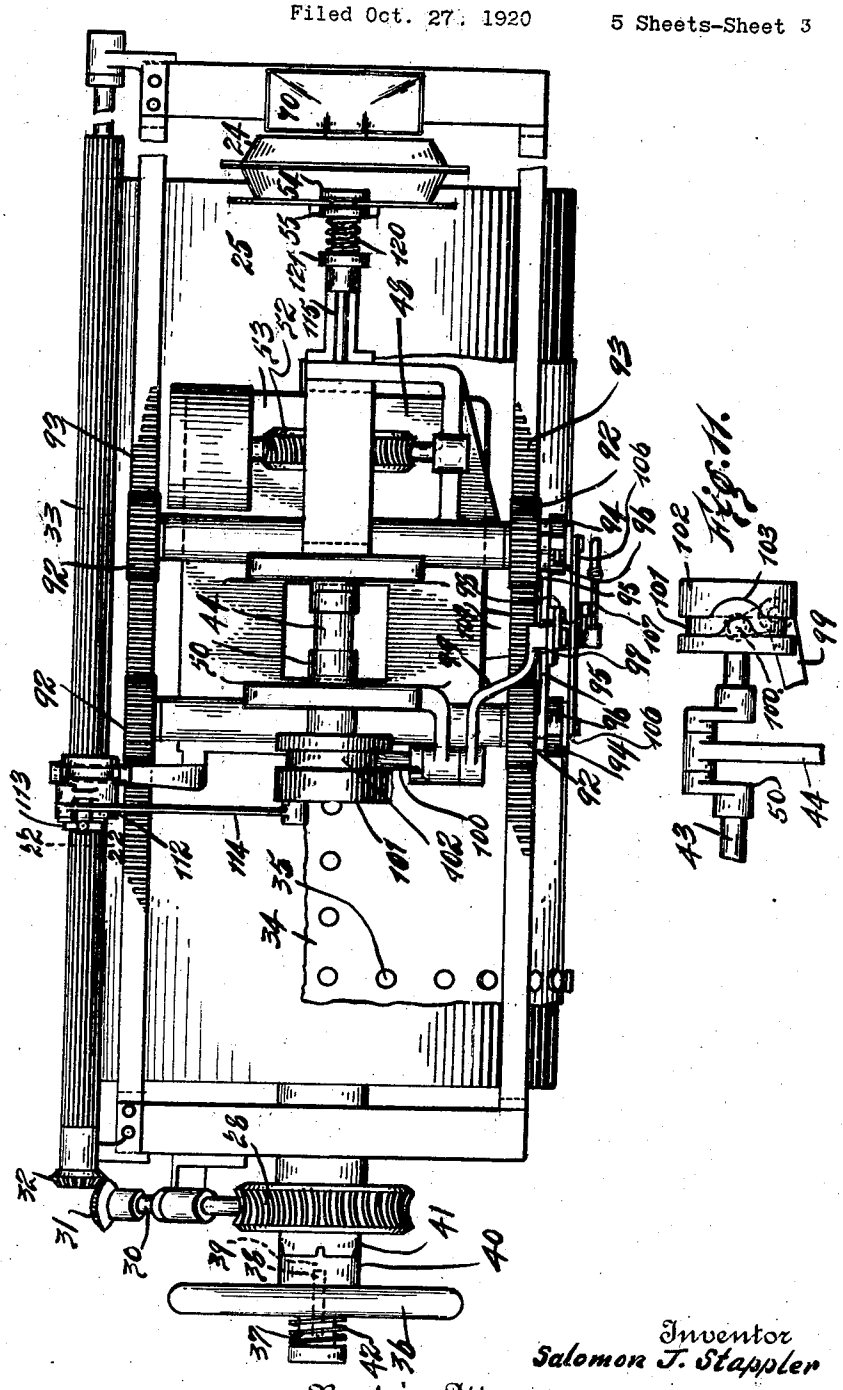


Fig. 10.

Fig. 11.

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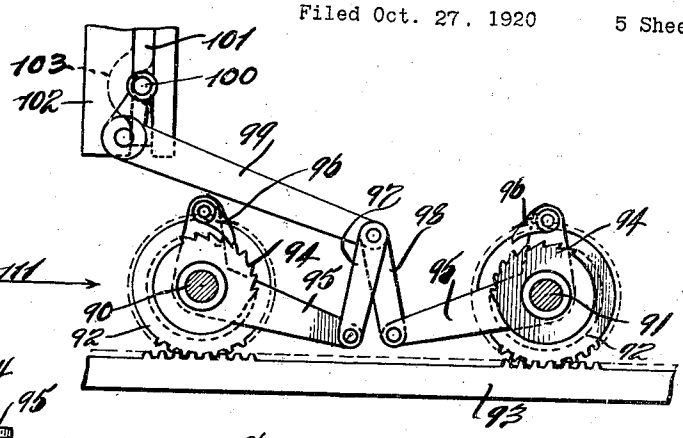


Fig. 12.

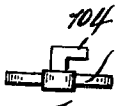


Fig. 14.

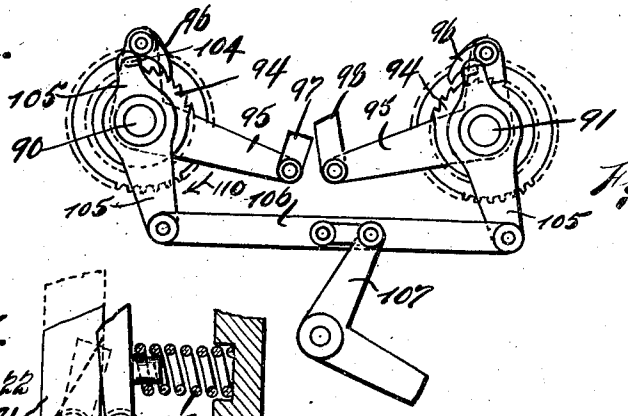


Fig. 13.

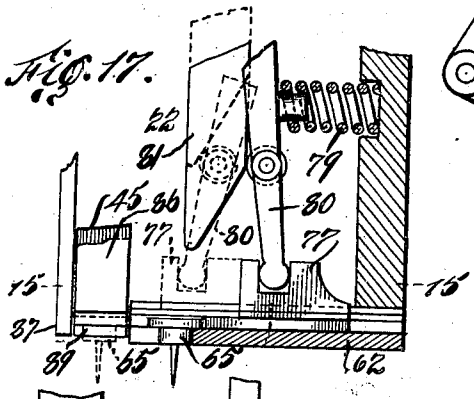


Fig. 17.

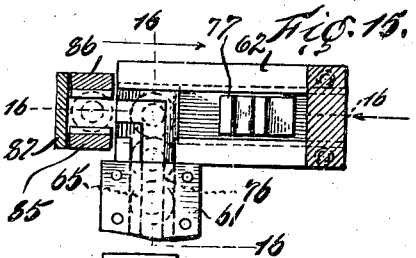


Fig. 15.

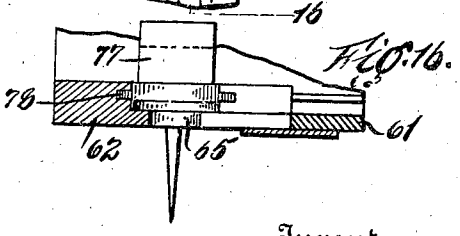


Fig. 16.

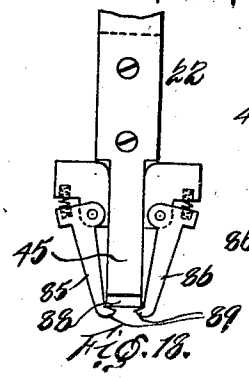


Fig. 18.

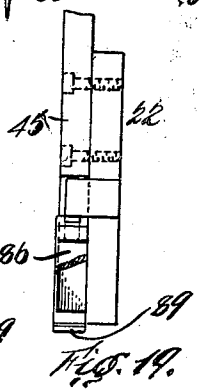


Fig. 19.

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SKIN NAILING MACHINE

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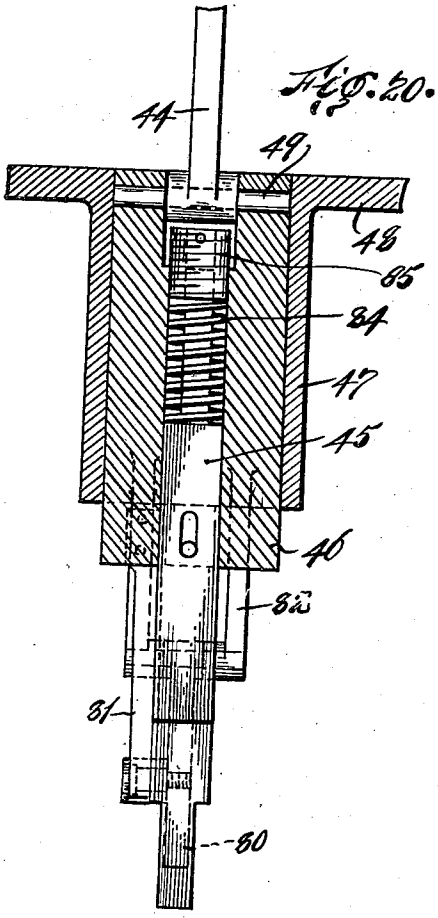


Fig. 20.

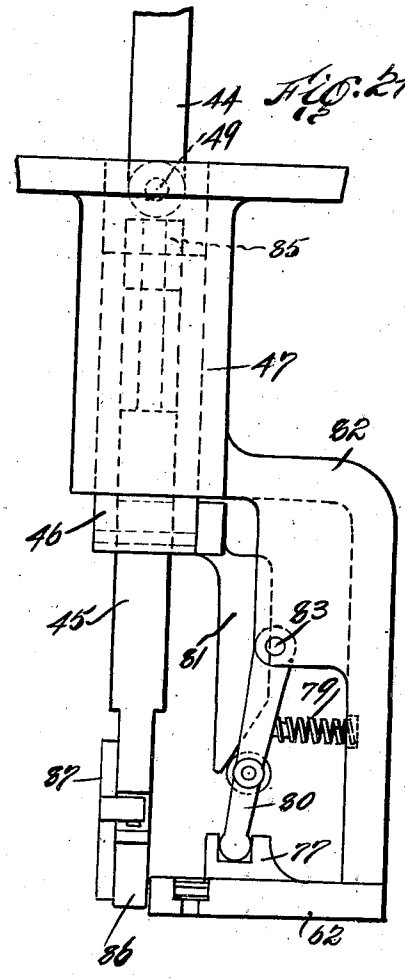


Fig. 21.

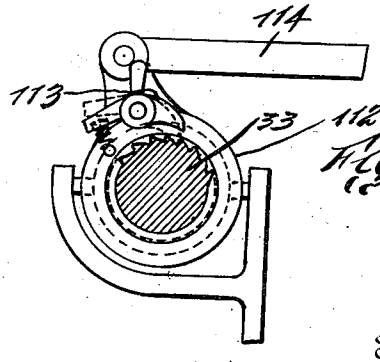


Fig. 22.

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By his Attorney

Patented Apr. 1, 1924. 1,488,563

UNITED STATES PATENT OFFICE.

SALOMON J. STAPPLER, OF NEW YORK, N. Y.

SKIN-NAILING MACHINE.

Application filed October 27, 1920. Serial No. 419,828.

To all whom it may concern:

Be it known that I, SALOMON J. STAPPLER, a citizen of the United States of America, residing at New York city, Bronx County, State of New York, have invented certain new and useful Improvements in Skin-Nailing Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in machines for applying skins to a suitable carrier, preferably by means of nails. The object of applying or fastening skins, having fur thereupon, to a carrier, is for the purpose of stretching the skins, and one of the objects of my invention is to provide an improved mechanism for tacking or nailing the said skins to the carrier in order that they can be dried while in stretched condition.

A further feature of my invention resides in improved means to automatically feed the skin-tacking or nailing device longitudinally of the axis of the carrier by a step-by-step movement, said feeding means being controlled by the action of the hammer mechanism.

A further feature of my invention resides in means to cause a skin carried thereby to move in a path transversely of the axis of the carrier, said movement being also controlled by the hammer mechanism. Other features of improvement will hereinafter appear.

In the accompanying drawings—

Fig. 1 is a side elevation of my improved machine, broken away at the lower portion thereof;

Fig. 2 is an enlarged sectional detail view of the magazine rotating device;

Fig. 3 is an enlarged sectional view of the nail or tack magazine assembly;

Fig. 4 is a face view of the magazine drum;

Fig. 5 is an enlarged fragmentary sectional view, the section being taken on a line 5—5 in Fig. 6;

Fig. 6 is a detail top plan view of the support for the magazine drum;

Fig. 7 is an enlarged sectional view, the section being taken on a line 7—7 in Fig. 9;

Fig. 8 is an enlarged cross-sectional view of the nail or tack chute, the section being taken on a line 8—8 in Fig. 1;

Fig. 9 is an enlarged vertical sectional view of one of the gathering devices for the nails, the section being taken on a line 9—9 in Fig. 7;

Fig. 10 is a top plan view of the machine;

Fig. 11 is a detail diagrammatic view, illustrating the relationship between the crank for operating the hammer and the cam for operating the ratchet levers of the feeding device for the hammer carriage;

Figs. 12 and 13 are diagrammatic views, illustrating the ratchet or feeding mechanism for the hammer carriage;

Fig. 14 is a detail view of the upper end of one of the pawl throw-out levers;

Fig. 15 is a sectional plan view of the nail or tack feeding slide, the section being taken on a line 15—15 in Fig. 17;

Fig. 16 is a sectional view, taken on a line 16—16 in Fig. 15;

Fig. 17 is a fragmentary sectional view of the lower portion of the hammer mechanism;

Figs. 18 and 19 are detail views, illustrating the lower portion of the hammer;

Fig. 20 is a sectional view on an enlarged scale, illustrating the hammer mechanism complete;

Fig. 21 is a side view thereof; and Fig. 22 is a sectional detail view taken on line 22—22 in Fig. 10.

As herein embodied, my improved nailing machine consists of a movable carriage 22 carrying a hammer mechanism 23, a hopper 24 for a supply of nails or tacks, a carrier 25 for skins, and means to operate the parts named, all of which are mounted on a frame 26, the lower part of which is broken away (see Fig. 1). The carrier 25 in this instance consists of a rotatable drum suitably mounted in bearings 27 on the frame 26. The carrier will be rotated, or partly so, by means of a worm-gear 28 and an intermeshing worm 29 carried by an angularly disposed shaft 30, which carries a gear 31 at its free end meshing with a gear 32 on the adjacent end of a rotatable rack 33, car-

ried by the frame 26. The carrier 25 will be rotatably operated step by step only while a skin, indicated by 34, is being tacked or nailed along the edges disposed transversely of the axis of the carrier or drum 25. The nails or tacks adjacent the edges mentioned are indicated by 35. Fig. 1 illustrates one edge only as having been secured to the carrier and a portion of a longitudinal edge. While the transverse edges of a skin are being nailed or tacked, the carriage 22 will remain stationary and the carrier will be rotatably operated step by step. While the longitudinal edges of a skin are being nailed or tacked, the carrier will remain stationary, but the carriage will move step by step in parallelism with the axis of the carrier. Both the rotary movement of the carrier 25 and movement of carriage 22 will be controlled by the hammer operating mechanism and said parts will be timed to operate to move the carrier or carriage after a nail or tack has been applied but before a subsequent nail or tack is to be applied; in other words, the carrier or carriage will be operated during the time that the hammer is rising after having applied a nail or tack. By this means I am enabled to space the nails or tacks evenly along the edges of a skin, the said spacing being accomplished automatically. The carrier 25 may be rotated by hand in order to set a skin properly with respect to the hammer mechanism, or for any other purpose, by means of a hand-wheel 36 (Fig. 10), which is slidably but rotatably connected to the shaft 37 for the carrier by means of a feather 38 on the shaft 37 and a key-way 39 in the hub 40 of the hand-wheel. The hub 40 of the hand-wheel, in this instance, is in the form of a crab-clutch which engages a cooperating member 41 on the worm-wheel 28. The clutch elements will be held in engagement by a spring 42. The worm-gear 28 will be connected to shaft 37 by means of the clutch mechanism described. To rotate the carrier by hand, wheel 36 will be moved to disengage the clutch, after which said drum can be rotated for any purpose whatsoever.

The carriage 22 supports the entire hammer mechanism and means to operate same, as well as the rotatable hopper 24 and its operating mechanism. The carriage 22 carries a crank shaft 43 for operating the pitman-rod 44 for operating the hammer plunger 45 (see Fig. 20).

The hammer plunger 45 is carried by a slide 46 mounted in a guide 47 carried by the plate 48 of the carriage 22, said slide and rod 44 being connected by a pin 49. During the operation of the device, plunger 45 will be reciprocated vertically by means of the crank 50. The shaft 43 in this instance carries a worm-wheel 51 having in mesh therewith a worm 52 operated by a motor 53 carried by the plate 48 of carriage 22.

During the operation of the device, the hopper or magazine 24 will be rotated by means of a friction drive consisting of a pair of disks 54 and 55 which are caused to grip an annular fin 56 carried by the hopper 24. The hopper 24 is rotatably mounted on a tubular bearing 57 carried by a bracket 58 on the carriage 22. The hopper is provided with a sleeve 59 to fit said bearing 57. Within the hopper I place a plurality of radially disposed collectors or agitators 60 which act to pick up the nails or tacks and deliver them to a chute 61 which in turn conveys them to a box 62 adjacent the hammer plunger 45. Each collector or agitator consists of a tubular post open as at 63 for a portion of its length and also open at the top as at 64. The opening or slot 63 in said post is provided for the purpose of allowing the nails or tacks indicated by 65 to assume a position approximately at a right angle to the longitudinal axis of the posts, after they have been picked up by said posts and fallen thereinto, as indicated in Fig. 9. To cause the shanks of the nails or tacks to be directed toward the slot 43, I provide each of said posts with a block 66 cut at an angle at the top, as indicated by 67, the wall 68 of said post being disposed in parallelism with the axis of the post and spaced from the slot 63 sufficiently to receive the heads of the tacks or nails, said space being indicated by 69. Should a tack or nail be picked up, point down, it would fall down through the post and be turned by the angular wall 67 to cause the point to project through the slot 63 and the head to fall into space 69. Should a tack or nail be picked up, head down, the angular wall 67 will turn the nail or tack and cause the point to project through said slot 63 and the head to fall into space 68. The nails will not fall through the posts until said posts have assumed the proper position, this being obvious. The supply of nails or tacks will be in the bottom of the hopper, but as the hopper rotates they will be agitated and some of them picked up by the posts. The nails or tacks will be fed to the hopper through a funnel 70 having an opening 71 alining with an opening 72 in the hollow bearing member 57. The bearing member 57 is partitioned as at 73 to prevent the tacks from falling through the bearing member. Each post, at its lower end, alines with an opening 74 for the passage of the tacks or nails which pass through the posts. The tubular bearing 57 is also provided with an opening 75 which alines with the passage 76 in the chute 61. Each time that a post assumes a verti-

cal position, openings 74 and 75 will aline (see Fig. 3) and a tack will fall into chute 61. When the nails or tacks fall into the chute 61, they will move by gravity into the box 62, as indicated by dotted lines in Fig. 15, from whence they will be moved one by one to a position under the hammer-plunger 45 by means of an ejecting slide or ejector 77 which is operated to and fro or reciprocated in a guide-way 78. The slide or ejector 77 will be moved outwardly to move a tack under the plunger by a spring 79, whenever the hammer 45 is raised; hence when the plunger is lowered the tack will be driven through the skin into the carrier. When the plunger lowers to drive a tack, the lever arm 80, which actuates the slide 77, will be moved or swung backwardly by a cam 81, whereby said slide will be moved back, allowing another tack to move into position before the slide or ejector 77. The lever 80, at its upper end, is pivotally connected to a bracket 82, as at 83, which extends from the slide 47. As can be seen in Fig. 21, the cam 81 is carried by the slide 46 and moves with it, as is evident.

As can be seen in Fig. 20, the hammer-plunger 45 is yieldably mounted in the slide 46, and is backed by a relatively stiff spring 84, the tension of which can be adjusted by means of an adjustable block 85. I prefer to make the plunger yieldable to prevent breakage, should, for any reason, a tack be driven against the head of a previously applied tack. The tension of the spring will be enough to permit of the driving of a tack without compressing said spring to any great extent. When a tack is moved out of the box 62, it will be placed between yieldable fingers 85 and 86 pivotally supported by the hammer-plunger 45, as indicated in Figs. 15, 17, 18, 19, 20 and 21. Adjacent the fingers I place a stop plate 87 which prevents the tacks from being forced too far. When a tack is moved into position between said fingers, it will be under the hammer plungers 45. The space 88, between the end of the plunger 45 and lips 89 of the fingers will be just enough to receive the head of a nail or tack. When the hammer plunger is lowered a tack held by the fingers 85 and 86 will be driven home. When the plunger rises, the fingers 85 and 86 will yield outwardly and slip off the head of the driven tack.

While tacks are being applied along the longitudinal edges of a skin, the carriage 22 will move step by step by means of a ratchet mechanism carried by each shaft 90 and 91 supported by the carriage 22. Each shaft 90 and 91, at each end, carries a gear 92 which meshes with a rack 93 on the frame 26. Each shaft 90 and 91, adjacent one end, carries a ratchet wheel 94 and a lever 95 supporting a pawl 96. The levers 95 are connected by links 97 and 98 to a bell crank lever 99 having a pin 100 engaging a slot 101 of a cam-disk 102 on shaft 43. The slot 101 has a cam portion 103 designed to actuate lever 99 which in turn operates shaft 90 or 91 through the medium of the pawls 96. The cam portion 103 is disposed, relatively to the crank 50, so as to actuate lever 99 while the hammer plunger is rising; hence the carriage 22 will be advanced or the carrier advanced one step between nailing periods. As the carriage will have to be moved longitudinally of the axis of the carrier in either direction, I provide each shaft 90 and 91 with a ratchet mechanism, but the pawls thereof will be oppositely set. As indicated in Figs. 12 and 13 the ratchets are set to advance the carriage toward the left in Fig. 1. For this reason pawl 96 for shaft 90 is down and pawl 96 for shaft 91 is up. To permit the pawls 96 to mesh with their respective racks or to clear same, I provide, adjacent each pawl, a throw-out device, consisting of a pin 104 carried by a movable arm 105. The arms 105 are connected by a link 106 which in turn is connected to an operating handle 107 pivoted at 108 to a bracket 109 extending from the carriage 22 (see Fig. 1). When arms 105 are moved to cause pins 104 to move to the left, as indicated in Fig. 13, pawl 96 for shaft 90 will engage its ratchet and pawl 96 for shaft 91 will be raised. When positioned, as described, the ratchet mechanism will cause the carriage to move step by step toward the right during the passage of pin 100 through the cam portion 103 of slot 101, which action will take place while the hammer plunger is rising after a hammering stroke. In other words, while pin 100 is passing through cam portion 103 ratchet 96 for shaft 90 will be moved toward the left, jumping the teeth of its ratchet, then to the right, causing shaft 90 to turn as per arrow 110, thereby feeding carriage 22, as per arrow 111 in Fig. 12. To cause carriage 22 to move in the opposite direction, lever or arm 107 will be moved to cause pins 104 to move toward the right (see Fig. 13), thereby raising pawl 96 for shaft 90 to clear its ratchet and allowing pawl 96 for shaft 91 to engage its ratchet. To feed the carrier 25 step by step, the arms 105 will be positioned in a vertical line, causing the pins 104 to hold both pawls 96 clear of their ratchets, in which event shafts 90 and 91 will not rotate. The arms 105 will be moved to the above mentioned position to apply nails or tacks along the transverse edges of a skin. When nails are to be applied along the transverse edges of a skin, the carrier 25, as has been stated, will be rotated step by step each time the hammer plunger rises after a hammering stroke. To accomplish this action on the part of the carrier, I provide the rotatable rack 33 with

a slidable support 112 which is also rotatably mounted on said rack (see Fig. 22). The support 112 carries a pawl 113 to engage the rack 33. When the ratchet mechanism is operating to feed the carriage 22 longitudinally of the axis of the carrier, the pawl 113 will be positioned to clear the rack 33. To rotate the carrier step by step, the pawl 113 will be moved to engage rack 33; hence during each up stroke of the hammer plunger, rack 33 will be partly rotated, thereby partly rotating carrier 25 through the train of gears described. To operate the support 112 for pawl 113, I connect same, by a link 114, to a crank-pin 115 on disk 102.

The friction drive disks 54 and 55 are carried by a shaft 115 carrying a gear 116 operated by a gear 117 on shaft 43 through an idler gear 118. Referring to Fig. 2 it will be seen that disk 54 is tight upon shaft 43, while disk 55 is slidably mounted on hub 119 of disk 54, and held against the fin 56 by means of a spring 120. The tension of spring 120 can be adjusted by means of the adjustable plate 121 on the hub 119 of disk 54. The disks 54 and 55 will be preferably faced with leather, rubber or the like, as indicated by 123. Should it be desirable to apply tacks diagonally of a skin upon the carrier, in order to cause the skins to lie perfectly flat, both the ratchet mechanism for advancing the carriage longitudinally of the carrier and the ratchet mechanism for rotating the carrier step by step can be caused to operate in unison. In this event a line of tacks would be applied diagonally of a skin upon carrier 25.

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

1. In combination with a carrier for skins or the like, a movable carriage, a nail applying device carried thereby, means operable by the nail applying device to automatically feed the carriage step by step longitudinally of the axis of the carrier, and means also operable by the nail applying device to feed the carrier in a direction transversely of the path of movement of the carriage, and means for limiting the movement of said carriage and said carrier.

2. The combination of a rotatable carrier for skins, racks arranged longitudinally of said carrier, a carriage, rotatable gears carried by the carriage and meshing with said racks, a nailing device carried by the carriage, means to operate the nailing device, a ratchet and pawl mechanism arranged to rotate said gears to cause the carriage to move along said racks, means operable by the nailing-device, operating means to actuate the ratchet and pawl mechanism, and means also operable by the nailing device operating means to rotate said carrier.

3. The combination of a carrier for skins or the like, a carriage movable longitudinally of the carrier, a shaft rotatably supported by the carriage and having a crank, a hammer operated by the crank, a cam carried by the crank shaft, a lever operated by the cam, a ratchet mechanism operable by said lever, and means operable by the ratchet mechanism to operate the carriage longitudinally of the carrier, said cam being set, relative to the crank which actuates the hammer, to operate the lever while said crank is crossing the upper dead center, in which position the hammer will be raised.

4. The combination of a rotatable carrier for skins or the like, a carriage movable longitudinally of the carrier, a shaft rotatably supported by the carriage and having a crank, a hammer operated by the crank, a cam carried by the crank-shaft, a lever operated by the cam, a ratchet mechanism operable by said lever, means operable by the ratchet mechanism to operate the carriage longitudinally of the carrier, said cam being set, relative to the crank which actuates the hammer, to operate the lever while said crank is crossing the upper dead center, in which position the hammer will be raised, a ratchet mechanism operable by said crank shaft, means operable by the ratchet mechanism to rotate said carrier step by step, and means for controlling the operation of the ratchet mechanism for rotating the carrier step by step.

5. The combination of a rotatable carrier for the application of skins, a carriage movable longitudinally thereof, a hammer mechanism carried by the carriage, means also carried by the carriage to operate the hammer, a motor mechanism also carried by the carrier to operate the hammer operating mechanism, means operable by the motor mechanism, to advance the carriage step by step longitudinally of the carrier, means also operable by the motor mechanism to rotate the carrier step by step, and means for controlling the longitudinal movement of the carrier and also the rotation thereof.

6. The combination of a rotatable carrier, a carriage movable longitudinally thereof, a nailing mechanism carried by the carriage, means to rotate the carrier step by step, means to move the carriage longitudinally of the carrier step by step, and means whereby both the rotation of the carrier and movement of the carriage can be effected simultaneously.

7. The combination of a carrier, a nailing device adjacent thereto, said nailing device and carrier being arranged for a step by step movement relative to each other simultaneously to cause nails to be applied diagonally of the article mounted on said carrier, and means for limiting the movement of said nailing device and said carriage.

8. In combination with a carrier for skins or the like, a movable carriage, a nail applying device carried thereby, means operable by the nail applying device to automatically feed the carriage step by step longitudinally of the axis of the carrier, and means also operable by the nail applying device to feed the carrier step by step in a direction transversely of the path of movement of the carriage, simultaneously with the longitudinal movement of the carriage, and means for controlling the movement of the carrier and the carriage.

Signed at New York city, N. Y., this 16th day of October, 1920.

SALOMON J. STAPPLER.

Witnesses:
EDWARD A. JARVIS,
MAURICE BLOCK.