A. EPPLER.

INSOLE MACHINE.

APPLICATION FILED FEB. 24, 1905.

952,701.

Patented Mar. 22, 1910.

5 SHEETS—SHEET 1.

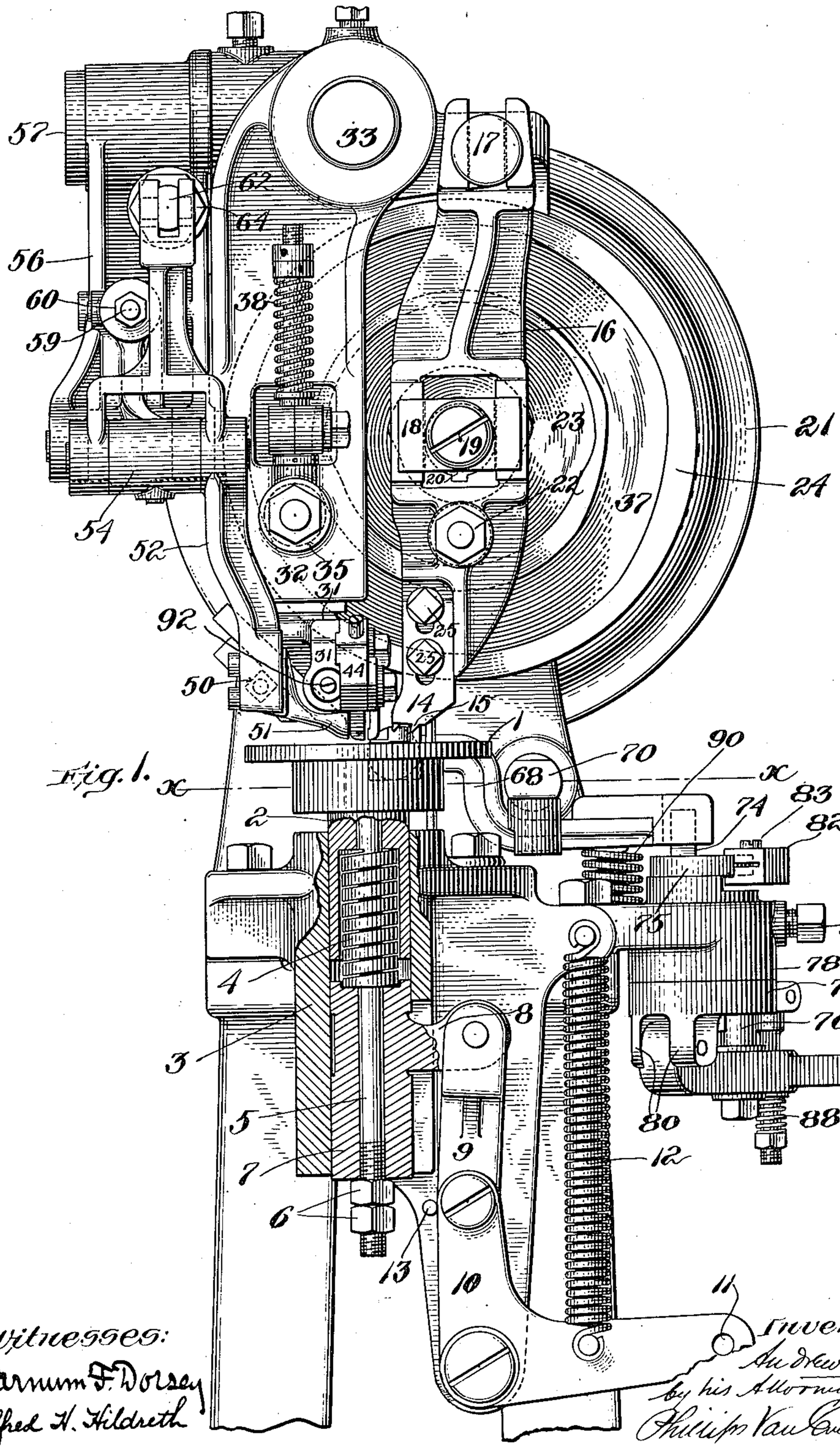

Fig. 1.

Witnesses:
Parnum F. Dorsey
Alfred H. Hildreth

Inventor:
Andrew Eppler
by his Attorneys
Philipps Van Santvoord & Fish.

A. EPPLER.

INSOLE MACHINE.

APPLICATION FILED FEB. 24, 1905.

952,701.

Patented Mar. 22, 1910.

5 SHEETS—SHEET 2.

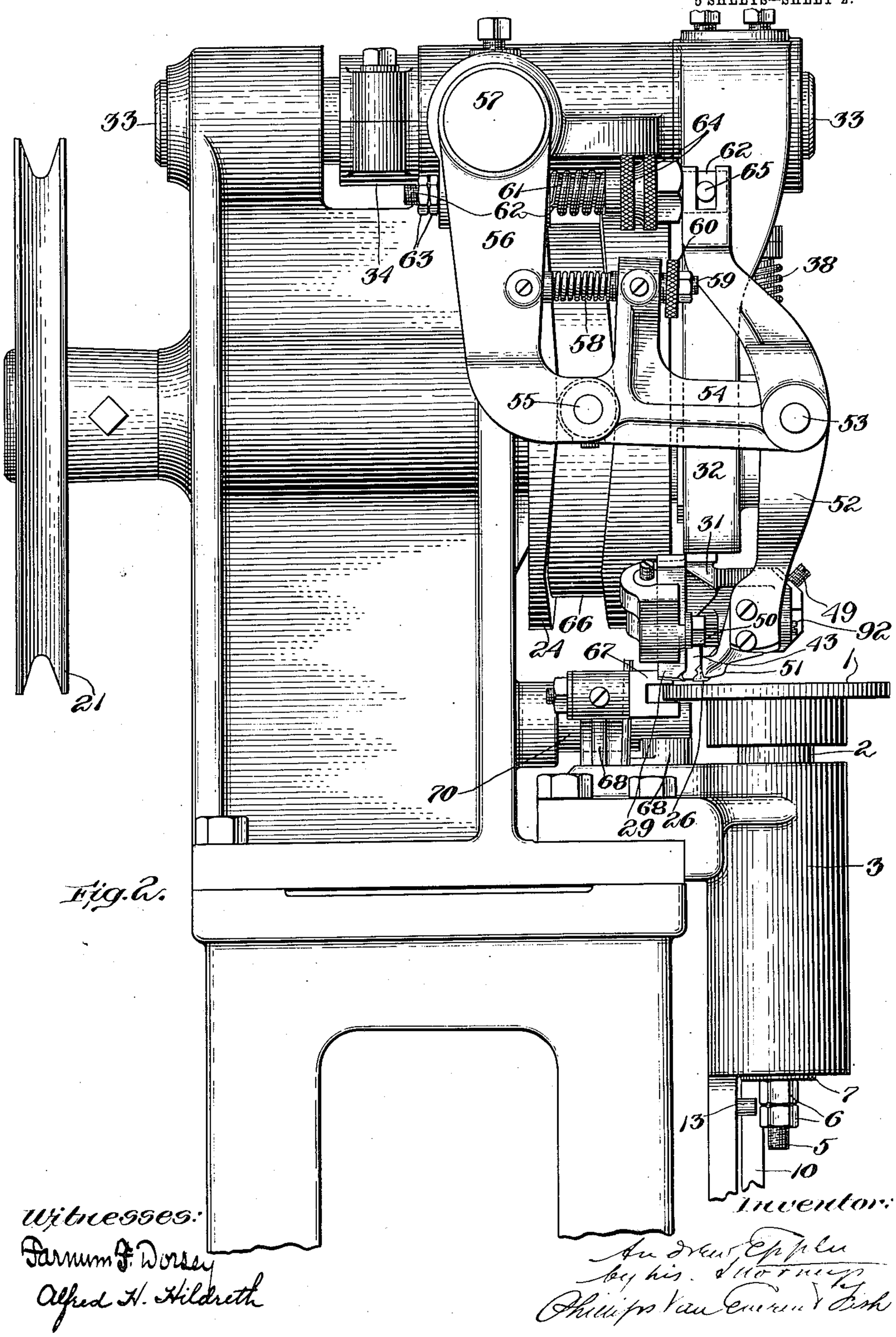

Fig. 2.

Witnesses:
Farnum F. Dorsey
Alfred N. Hildreth

Inventor:
Andrew Eppler
by his Attorneys
Philipps Van Orman & Fish

952,701.

A. EPPLER.

INSOLE MACHINE.

APPLICATION FILED FEB. 24, 1905.

Patented Mar. 22, 1910.

5 SHEETS—SHEET 3.

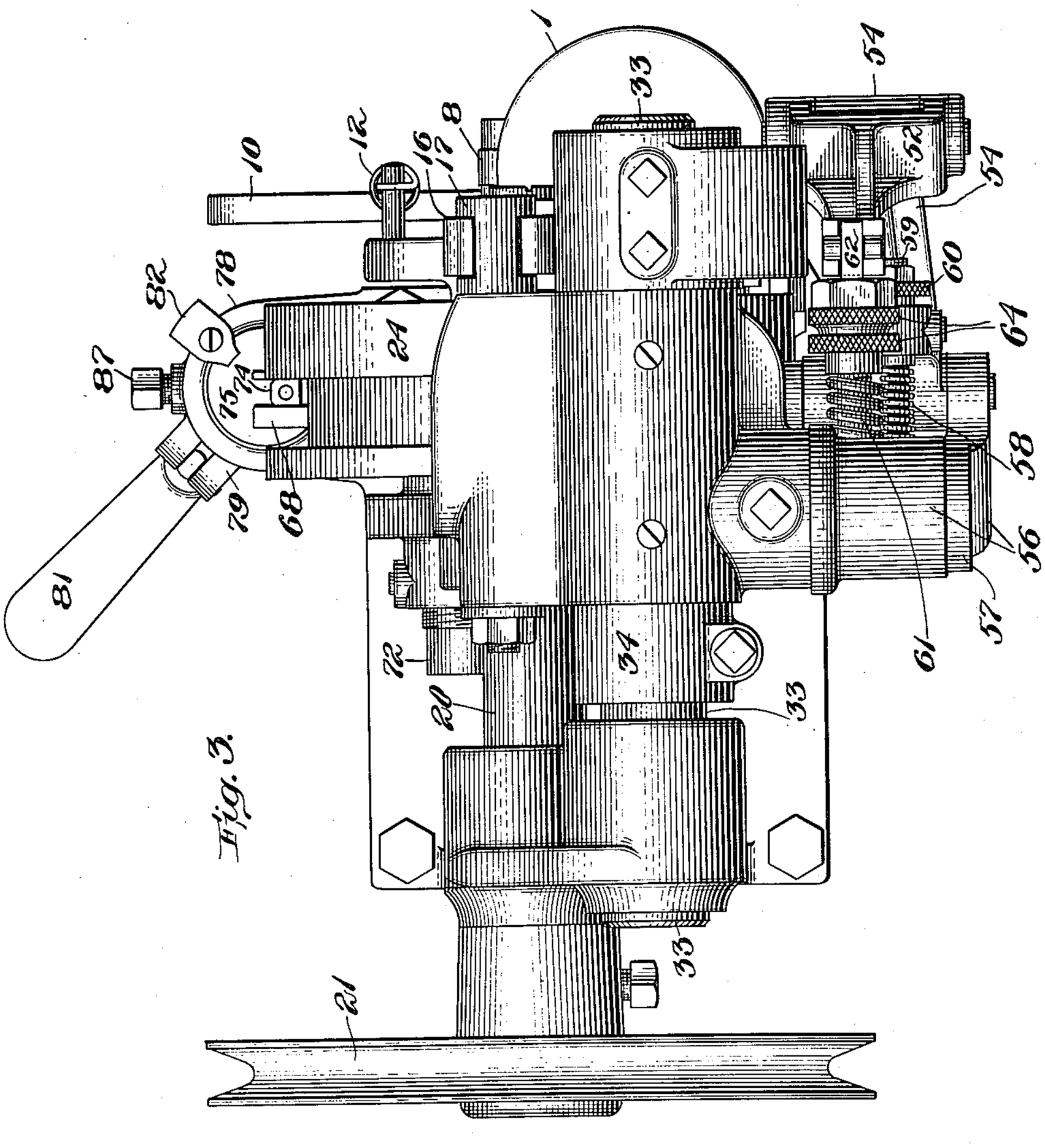

Fig. 3.

Witnesses:
Farnum F. Dorsey
Alfred H. Hildreth

Inventor:
Andrew Eppler
by his Attorneys
Phillips Van Everen & Fish

952,701.

A. EPPLER.

INSOLE MACHINE.

APPLICATION FILED FEB. 24, 1905.

Patented Mar. 22, 1910.

5 SHEETS—SHEET 4.

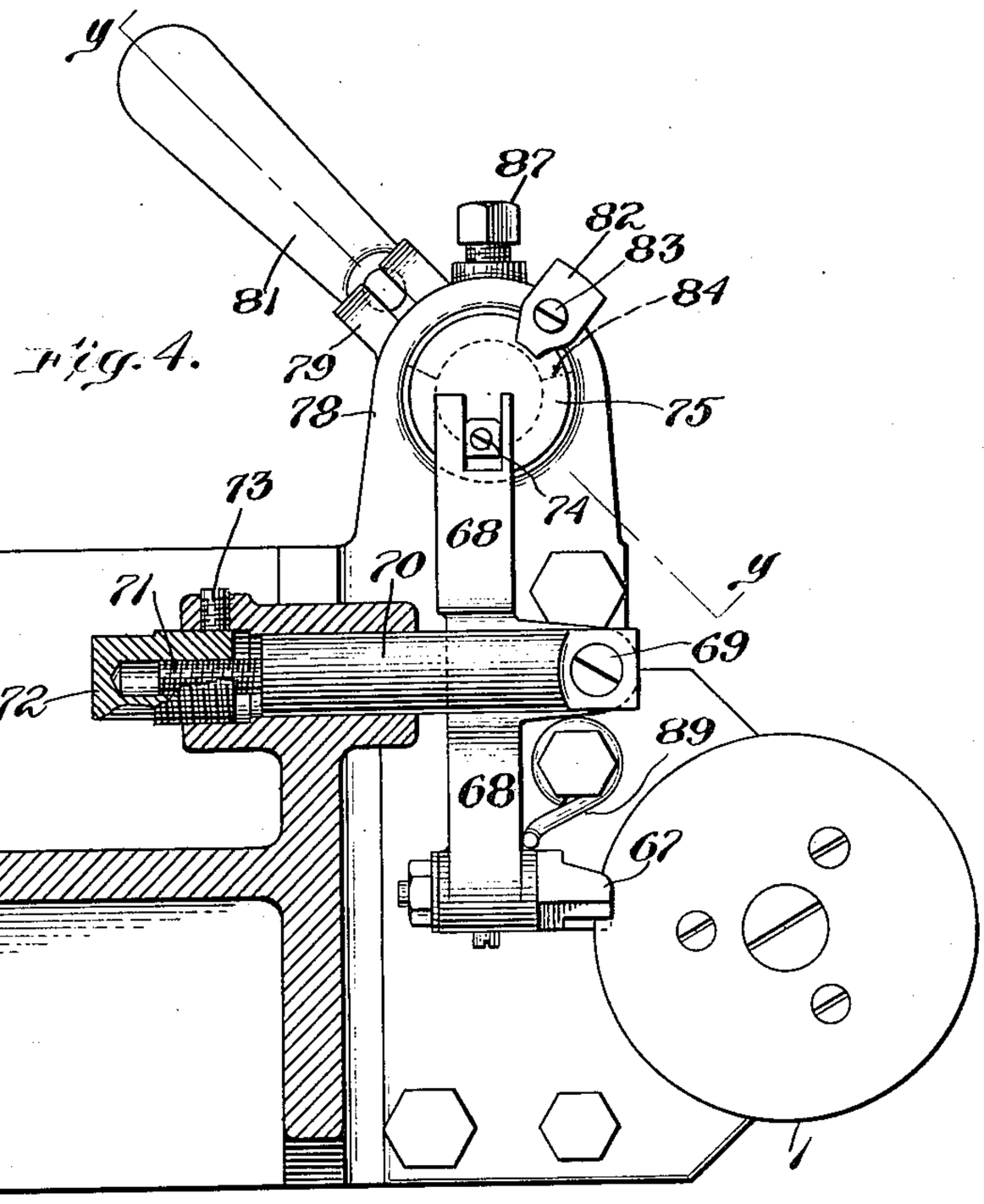

Fig. 4.

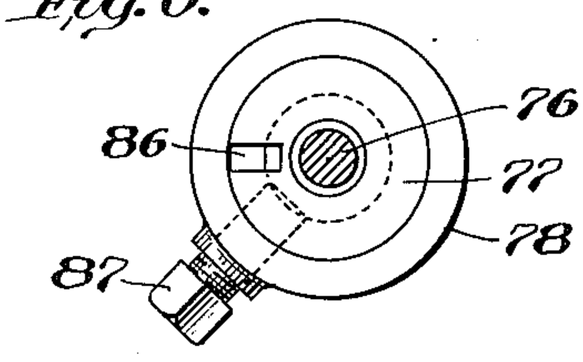

Fig. 6.

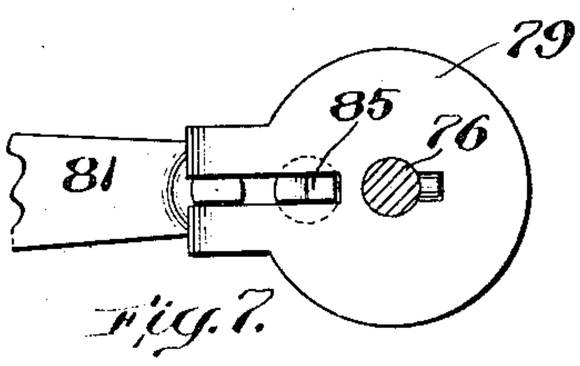

Fig. 7.

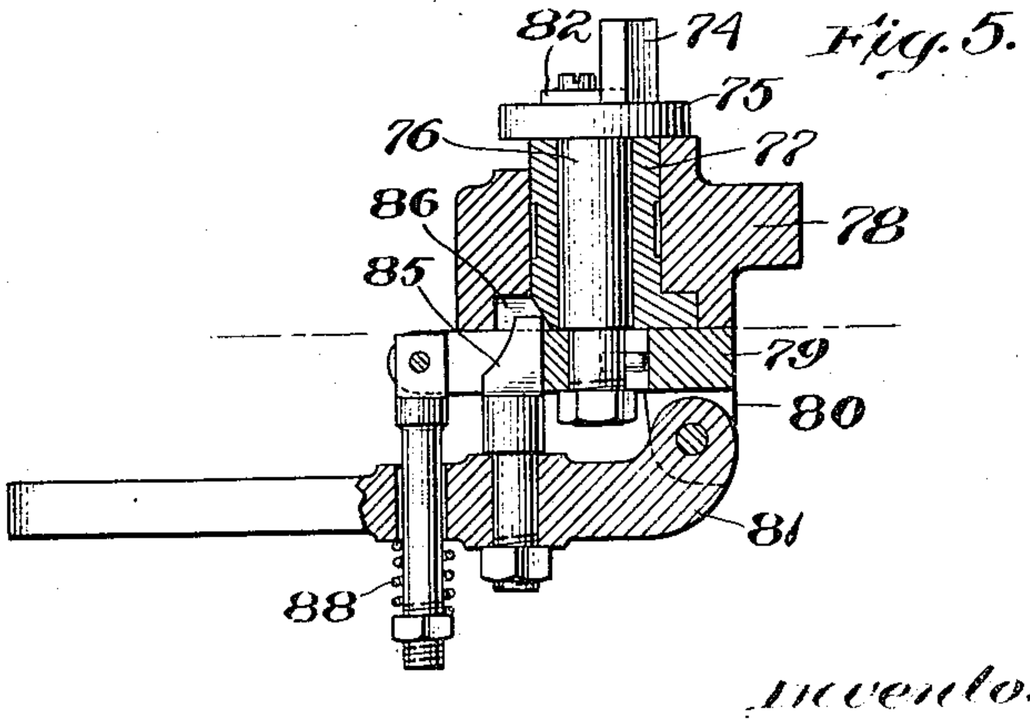

Fig. 5.

Witnesses:

Farnum F. Dorsey

Alfred W. Hildreth

Inventor:

Andrew Eppler

by his Attorneys

Phillips Van Cureen & Fish

A. EPPLER.

INSOLE MACHINE.

APPLICATION FILED FEB. 24, 1905.

952,701

Patented Mar. 22, 1910.

5 SHEETS—SHEET 5.

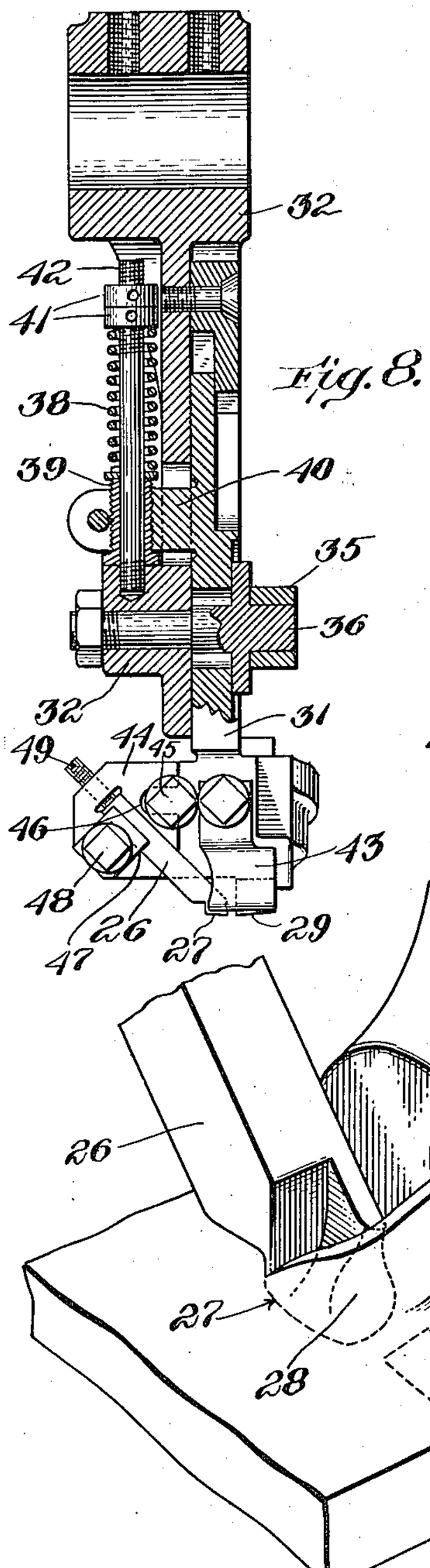

Fig. 8.

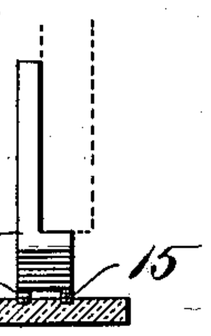

Fig. 11.

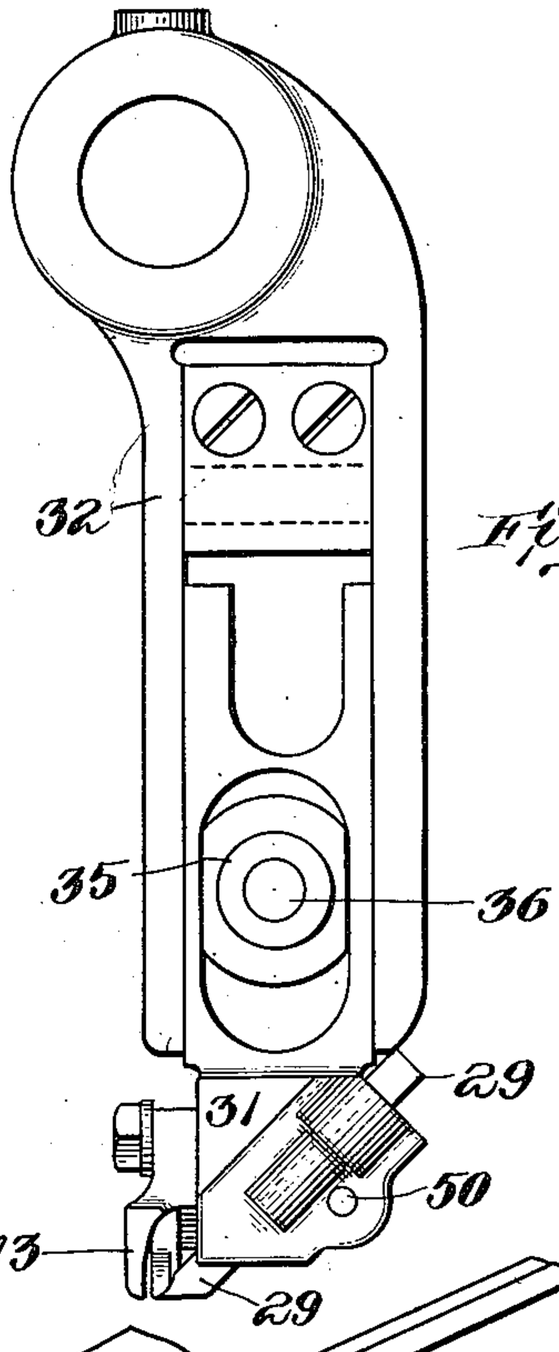

Fig. 9.

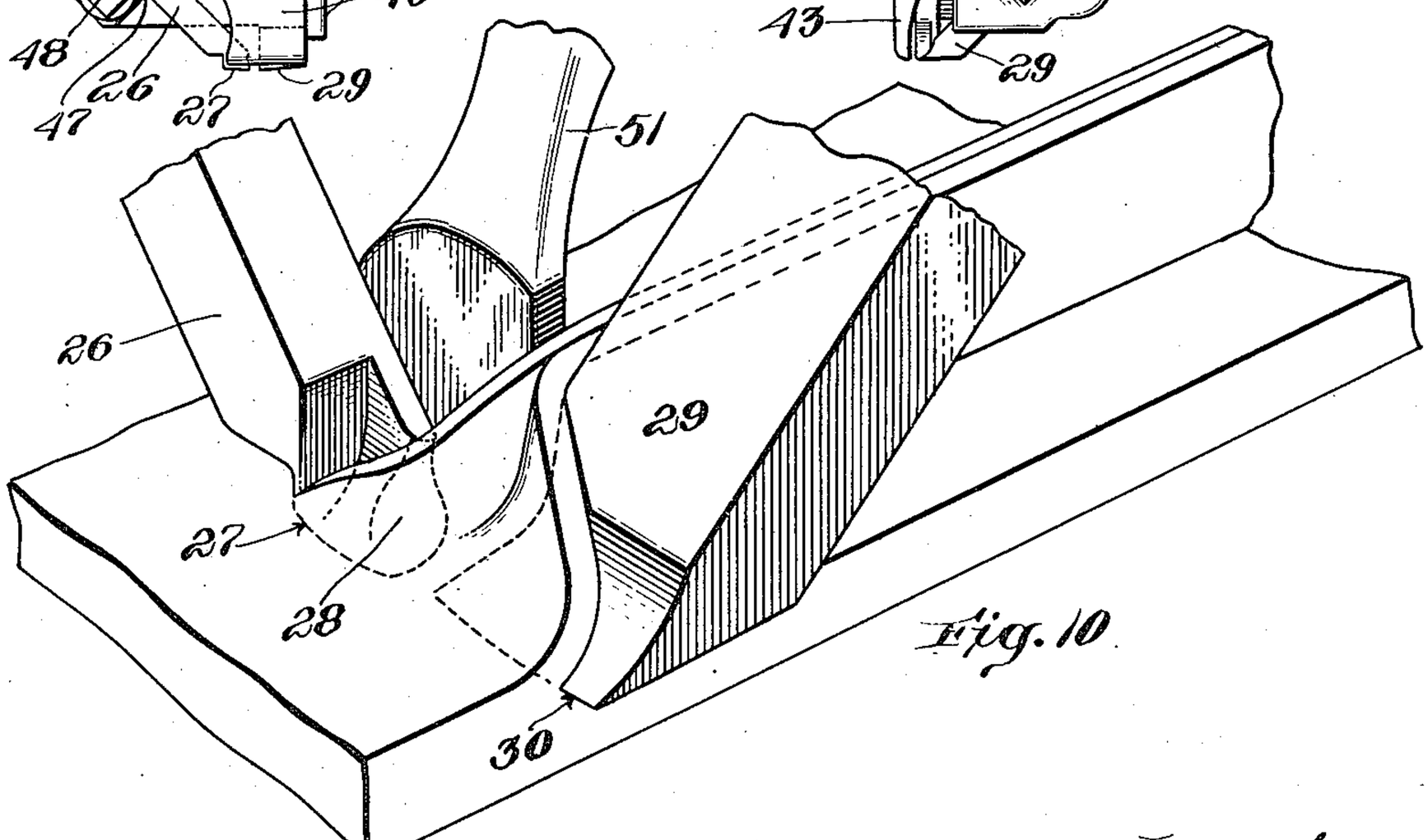

Fig. 10.

Witnesses:

Farnum T. Dorsey

Alfred H. Hildreth

Inventor:

Andrew Eppler

by his Attorneys

Philipp Van Cleve & Fish

UNITED STATES PATENT OFFICE.

ANDREW EPPLER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

INSOLE-MACHINE.

952,701. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed February 24, 1905. Serial No. 247,115.

To all whom it may concern:

Be it known that I, ANDREW EPPLER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Insole-Machines; 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.

This invention relates to improvements in insole machines.

The object of the invention is to improve the construction and operation of insole machines generally, and particularly to produce an improved machine for use in making insoles of the type in which two flaps are severed from the insole by oppositely disposed cuts and are bent upward against each other to form a compound lip.

To the above ends the invention consists in the improved insole machine hereinafter described and claimed.

In the drawings Figure 1 is a front elevation of a machine embodying the invention; Fig. 2 is a side elevation; Fig. 3 is a plan view; Fig. 4 is a sectional plan view taken on the line *x*—*x*, Fig. 1; Fig. 5 is a vertical section on line *y*—*y* Fig. 4, of the edge gage adjusting means; Figs. 6 and 7 are details in plan of the same part; Fig. 8 is a vertical section of the knife carrier; Fig. 9 is a rear view of the same; Fig. 10 is an enlarged perspective showing the manner in which the knives and hammer operate upon the work, and Fig. 11 is a detail view showing the feeding device engaging an insole.

The illustrated embodiment of the invention comprises a rotating work support, a channeling knife and a slitting knife mounted on an oscillating carrier, a four-motion feeding device for feeding the insole against the knives, an adjustable edge gage for regulating the distance of the lip from the edge of the insole, a vibrating hammer for setting in an upturned position the flaps cut by the knives, and mechanism for actuating these parts.

The work support 1 comprises a flat circular table fixed to a stem 2 which rotates in a sleeve 3 forming a part of the frame of the machine so that the work may be fed easily over the work support. In order to accommodate itself to various thicknesses of work, the work support is arranged to yield vertically, and is supported by a spring 4 pressing upward against the stem 2. The upward movement of the work support is limited by a stem 5 carrying adjustable nuts 6 which bear against the under side of a block 7 through which the stem 5 passes. The block 7 is arranged to slide in the sleeve 3 and has a lug 8 extending outward through a vertical slot in the sleeve and connected with a toggle comprising a link 9 and a bell crank lever 10. When the toggle is in the position shown in Fig. 1, the work support is maintained in its raised position and pressed upward firmly against the work by means of the spring 4.

In order to insert an insole in the machine the work support may be lowered by means of a suitable treadle connected at 11 with the toggle lever 10 and arranged to break the toggle and draw the block 7 and the other parts of the work support downward. When the treadle is released a spring 12 returns the parts to the position of Fig. 1. The movement of the toggle is limited by a pin 13 fixed to the frame. Owing to the above-described arrangement the work support may be easily lowered by the treadle without the necessity of compressing the comparatively strong spring 4.

The work is fed by a feeding device 14. As shown in Fig. 11, the feeding device has points 15 to engage the work, and these are arranged to act upon the surface of the insole upon both sides of the uncut portion between the cuts produced by the channeling knife and the slitting knife, so that the work is fed positively, but the indentations produced by the feed points do not weaken the between-substance. The feeding device is secured to a carrier 16, the upper slotted end of which is guided by a stub 17 pivoted to the frame of the machine. The lateral movements in the direction of feed are imparted to the carrier 16 by a slide block 18 engaging the slotted central portion of the carrier and pivotally mounted on a stub 19 fixed eccentrically, as shown in Fig. 1, to the forward end of the drive shaft 20 by which the machine is actuated. The drive shaft is journaled in the frame of the machine and carries a pulley 21 by which it is rotated. The longitudinal movements which cause the feed points to engage and disen-

gage the work are imparted to the carrier 16 by a cam roll 22 engaging a cam path 23 in a cam 24 fixed to the forward end of the shaft 20.

By the operation of means above described the feeding device first engages the work, moves from right to left (Fig. 1) then rises to disengage the work and returns from left to right to a position to again engage and feed the work.

The feeding device 14 is secured to the carrier 16 by screws 25 engaging slots in the feeding device, and this construction permits vertical adjustment of the feeding device to regulate the pressure with which it engages the work.

The channeling knife 26 has an inclined cutting edge 27 for severing a flap from the upper surface of the insole, and a plow 28 for turning this flap up into a position substantially perpendicular to the surface of the insole. The slitting knife 29 has an inclined cutting edge 30 for cutting a slit in the margin of the insole near its upper surface, and the shank of the slitting knife acts to turn this flap up against the channel flap, as shown in Fig. 10. The knives are both adjustably fixed to a knife carrier 31, which, as shown in Figs. 8 and 9, is arranged to slide vertically on an arm 32 fixed to a rock shaft 33, the shaft being journaled in the frame of the machine and provided with a collar 34 to prevent longitudinal movement. The arrangement of the two knives on one carrier simplifies the construction of the machine, and insures the proper relative position of the knives. The arm 32 and the knife carrier and knives are vibrated in the line of feed by means of a cam roll 35 pivoted on a stud 36 fixed to the arm and engaging a cam path 37 in the side of the cam 24. During the feeding of the work the cam imparts two rapid vibrations to the knives so that they cut by a chopping action at the time when the work is engaged and held by the feeding device. In order to press the knives yieldingly against the upper surface of the work, a spring 38 is used. The spring bears at its lower end against an adjustable threaded sleeve 39 in a lug 40 on the knife carrier. The upper end of the spring bears against adjusting nuts 41 on a stem 42 fixed to the arm 32. The downward movement of the knife carrier is limited by the engagement of the sleeve 39 with the arm 32 as shown in Fig. 8, so that when there is no work in the machine the knives will not engage the work support and be injured. When the machine is in operation the vertical position of the knife support is controlled by a presser foot 43 fixed thereto and arranged to engage the surface of the insole just in advance of the knives. This presser foot serves to fix the depth of cut of the knives, but the depth of the cuts and their relative position may be varied by adjusting the position of the knives on the knife carrier.

The adjustable connections between the knives and the knife carrier are arranged as follows: The channeling knife 26 lies in an inclined slot in a block 44 which is secured to the knife carrier by a screw 45 engaging a horizontal slot 46 in the block 44. The knife is secured to the block by a plate 47 and a screw 48. By loosening the screw 45 and moving the block 44 horizontally, the distance between the cuts produced by the channeling knife and the slitting knife may be varied. The horizontal movement of the block 44 is limited by an adjustable stop screw 92 which has a collar engaging a shoulder on the recessed back of the block 44. Owing to this arrangement the block may be removed to sharpen the knife and may then be returned to exactly the same position without particular care on the part of the operator. In order to adjust the depth to which the channeling knife cuts, the knife is moved longitudinally in the block 44 by means of a screw 49. The slitting knife is carried in an inclined slot in the knife carrier as shown in dotted lines in Fig. 1, and is clamped therein by a screw 50 engaging the shank of the knife. By adjusting the slitting knife longitudinally the thickness of the flap cut thereby may be varied.

The hammer 51 for pressing the flaps together and setting them in their upturned position is arranged to bear against the upper side of the insole and to strike one or more blows against the inner side of the channel flap at a point opposite the shank of the slitting knife, so that the two flaps are pressed and hammered together between the hammer and the slitting knife, and thereby are set in upturned position. The hammer is fixed to a carrier comprising a lever 52 pivoted at 53 on a bell crank lever 54, which is pivoted at 55 on an arm 56 journaled upon a stud 57 on the frame of the machine. The bell crank lever 54 is restrained from movement about its pivot 55 by means comprising a spring 58, a stem 59 pivoted to the arm 56, and adjusting nuts 60 on the stem. These means prevent movement of the bell crank lever in one direction, but permit its horizontal arm and the pivot 53 to yield upwardly by compression of the spring 58. The lever 52 is restrained from movement about its pivot 53 by means comprising a spring 61 and a stem 62 sliding in the arm 56, and having adjustable stop nuts 63 to limit its movement in one direction. The stem 62 also carries adjusting nuts 64 for regulating the compression of the spring 61, and a pin 65 engaging the slotted upper end of the lever 52. By these means the lever 52 is prevented from swinging in

one direction about its pivot 53, but may yield in the opposite direction by compression of the spring 61. Upon the pivot 55 is journaled a cam roll engaging a cam path 66 in the periphery of the cam 24, and the cam is formed to impart to the cam roll and the parts connected therewith a plurality of oscillations during the intervals between each feeding movement so as to cause the hammer to strike the channel flap as above described. The levers 52 and 54 and the arm 56 all operate normally as one part, but the manner in which the lever 52 is mounted permits the hammer to yield horizontally according to the thickness of the material cut by the knives, and the bell crank lever 54 by motion about its pivot 55 permits the hammer to yield upwardly according to the thickness of the insole. By these means the hammer is caused to press with a substantialy uniform pressure against work of varying thickness and the hammer is caused always to engage the channel flap as low as possible, which is necessary to the best results. The hammer moves, in striking the channel flap, substantially parallel to the upper surface of the insole and perpendicular to the lip, so that it has no tendency to beat down or collapse the channel flap as is liable to occur in previous machines in which the hammer engages the lip with a downwardly inclined movement.

The edge gage engages the edge of the insole which is to be operated upon and regulates the distance between the edge of the insole and the lip formed by the knives and other instrumentalities. It is customary to make this distance greater at the shank portions of the insole than around the forepart, and in order to provide for doing this or for otherwise varying the width of the margin of the insole the edge gage is made horizontally adjustable so that its position may be varied during the operation of the machine upon an insole. It is also arranged to move vertically so as to follow the vertical movements of the work support and remain in proper relative position thereto. The edge gage 67 is mounted on a lever 68 pivoted by means of a screw 69 to a stem 70 journaled in the frame of the machine. The lever 68 may swing horizontally about the screw 69 and the stem 70 turns freely in its journal and permits the lever to swing vertically. The stem 70 has a threaded extremity 71 engaging a nut 72 oppositely threaded upon its exterior and engaging a threaded socket in the frame of the machine. By turning the nut 72 the stem 70, owing to the differential action of the threads, may be moved out or in to adjust the position of the edge gage. The nut 72 is fixed in adjusted position by a set screw 73. In order to move the edge gage during the operation of the machine to vary the width of the margin of the insole means are provided for swinging the lever 68 about the screw 69. The outer end of the lever 68 is forked and engages a slide block 74 pivoted upon a plate 75 fixed to a vertical stem 76. The stem 76 is journaled in a sleeve 77 carried in a bracket 78 forming part of the frame of the machine. A plate 79 is fixed to the lower end of the stem 76 and is provided with ears 80 on which is journaled a hand lever 81 by means of which the stem 76 and plate 75 may be turned so that by means of the block 74 the lever 68 will be swung horizontally and will move the edge gage 67 toward or from the knives. In order that this adjustment may be made quickly during the operation of the machine and without particular attention on the part of the operator, adjustable stops are provided for determining the positions of the hand lever 81. The plate 75 carries an adjustable dog 82 which may be moved about the edge of the plate 75 and fixed in adjusted position by a screw 83. The bracket 78 is recessed as shown in Figs. 4 and 5 so as to provide a shoulder 84 which forms a stop against which the dog 82 bears to determine the forward position of the hand lever 81 and the position of the edge gage in which it is nearest to the knives. In order to determine the position of the edge gage when a wider margin is desired, the hand lever 81 has fixed thereto a latch 85 arranged to move in a slot in the plate 79 and to engage a notch 86 in the lower flanged end of the sleeve 77 when the hand lever is swung to the proper position. The sleeve 77 is normally fixed by a set screw 87 in the bracket 78, but the sleeve may be adjusted by loosening the screw and then swinging the sleeve by means of the latch 85 and hand lever 81. The latch 85 may be disengaged from the notch 86 by pushing the hand lever 81 down and the lever may then be swung until the dog 82 engages the shoulder 84, thus moving the edge gage 67 toward the knives. The hand lever is engaged by a spring 88 tending to hold the latch in engagement with the notch 86. A spring 89 fixed to the frame of the machine bears against the front of the inner end of the lever 68 and takes up lost motion in the mechanism for moving the edge gage. A spring 90 bears against the lower side of the outer end of the lever 68 and operates to keep the edge gage close to the upper surface of the work support when the latter rises and falls. The edge gage is also forked and has a portion engaging the under side of the work support so as to insure their proper coöperative relation.

By means of the construction of the edge gage adjusting mechanism above described, the edge gage may be moved quickly during the operation of the machine from one fixed position to another, and both positions of the gage may be adjusted as desired.

In the operation of the machine the work support is drawn down by means of the treadle and the work is inserted and pressed against the edge gage by the operator. This may be done while the machine is in motion. The knife carrier and the feeding device operate continuously to cut and feed the work and turn up and set the flaps, and the work is guided by the operator. In passing from the shank portion to the forepart of the insole the hand lever 81 is depressed and drawn forward by the operator and when the shank portion on the other side of the insole is reached the hand lever is pushed back again until the latch 85 engages the notch 86 and arrests the movement of the lever.

Although the present invention has been described as embodied in a machine for making insoles of a particular form, it is to be noted that many features of the invention are applicable to a machine for making insoles of other forms, and that the invention in its broadest aspect is not limited to the details of construction and operation illustrated and described in connection with the preferred embodiment thereof, but may be embodied in other forms broadly defined in the claims.

I claim—

1. An insole machine, having, in combination, a work-rest, and suitable operating instrumentalities comprising a four-motion feeding device, and mechanism for actuating the feeding device comprising a rotating shaft, a cam disk carried thereby, a lever to one end of which the feeding device is secured, fixed guiding means for the other end of the lever, an eccentric on the end of the shaft connected with the lever for imparting lateral vibrations to the lever, and a cam roll carried by the lever and engaging a cam path in the side of the cam disk, acting to impart longitudinal movement to the lever, substantially as described.

2. An insole machine, having, in combination, a work support, a vibrating knife for cutting a channel in an insole, a vibrating knife for slitting the margin of the insole, and single means for holding both of said knives yieldingly against the insole and a feeding device engaging the insole at both sides of the uncut portion between the channel and the slit, substantially as described.

3. An insole machine, having, in combination, a work support, a vibrating knife for cutting a channel in the insole, a vibrating knife for slitting the margin of the insole, and single means for holding both of said knives yieldingly against the insole and a feeding device having points arranged to engage the insole at both sides of the uncut portion between the channel and the slit, substantially as described.

4. An insole machine, having, in combination, a channeling knife and a feeding device, pivoted levers to which they are secured arranged to oscillate in the direction of feed, and means for actuating the levers comprising a shaft arranged perpendicular to the plane of motion of the levers, a cam disk carried by the shaft, cam paths in the side of the cam disk, and a direct connection between said levers and cam disk comprising cam rolls carried by the levers and engaging the said cam paths, substantially as described.

5. An insole machine, having, in combination, a knife carrier, a channel knife and a slitting knife carried thereby, means for feeding and supporting the work and means for vibrating the knife carrier in the direction of the feed, substantially as described.

6. An insole machine, having, in combination, a yieldingly mounted knife carrier, a channel knife and a slitting knife fixed thereto, and means for supporting and feeding the work, substantially as described.

7. An insole machine, having, in combination, a yieldingly mounted knife carrier, a channel knife, a slitting knife, and a presser foot fixed thereto, and means for supporting and feeding the work, substantially as described.

8. An insole machine, having, in combination, a knife carrier, a channel knife and a slitting knife fixed thereto by means permitting independent adjustment of the knives, means for supporting and feeding the work, and means for vibrating the knife support in the direction of feed, substantially as described.

9. An insole machine, having, in combination, a yieldingly mounted knife carrier, a channel knife and a slitting knife fixed thereto by means permitting independent adjustment of the knives, and means for supporting and feeding the work, substantially as described.

10. An insole machine, having, in combination, a knife carrier, a channel knife, a slitting knife and a presser foot fixed thereto by means permitting independent adjustment of the knives and the presser foot, means for vibrating the knife carrier, and means for supporting and feeding the work, substantially as described.

11. An insole machine, having, in combination, a yieldingly mounted knife carrier, a channeling knife, a slitting knife, and a presser foot, means for fixing the said parts to the knife carrier permitting independent adjustment of the said parts and means for supporting and feeding the work, substantially as described.

12. An insole machine, having, in combination, a work support, vibrating channeling and edge knives engaging the work on the opposite side from the work support means under the control of the operator for

moving the work support away from the channeling knife to permit the insertion of work, means for feeding the work and means for vibrating the knives in the direction of feed, substantially as described.

13. An insole machine, having, in combination, a yielding work support, a yieldingly mounted channeling knife engaging the work on the opposite side from the work support with less pressure than is exerted by the work support, means for feeding the work and means for vibrating the channeling knife in the direction of feed, substantially as described.

14. An insole machine, having, in combination, a feeding device engaging one side of the work, a yielding work support engaging the opposite side of the work, a spring for supporting the work support against the pressure of the feeding device, a channeling knife engaging the work on the same side as the feeding device, and a spring for pressing the channeling knife against the work, the pressure of the said spring being less than that of the spring which supports the work support, substantially as described.

15. An insole machine, having, in combination, a work support, means for feeding the work, a single yielding knife carrier, a channeling knife and a slitting knife and means for securing the knives to said knife carrier permitting independent longitudinal adjustment of each knife on said carrier, substantially as described.

16. An insole machine, having, in combination, a work support, means for cutting and turning up a portion of the substance of the insole and a hammer for fixing the cut portion in its upturned position arranged to yieldingly engage both the upturned portion and the main portion of the work, substantially as described.

17. An insole machine, having, in combination, a work support, means for cutting and turning up a portion of the substance of the insole, and a hammer for fixing the cut portion in upturned position, arranged to yield both parallel and perpendicular to the work support, substantially as described.

18. An insole machine, having, in combination, a work support, means for cutting and turning up a portion of the substance of the insole, a hammer for fixing the cut portion in upturned position, and means for actuating the hammer, comprising a lever to which it is fixed, a pivot on which the lever is mounted, the said pivot being arranged to yield perpendicularly to the work support, means for vibrating the pivot in a direction inclined to the work support, and yielding means for preventing oscillation of the lever upon the pivot, substantially as described.

19. An insole machine, having, in combination, means for cutting and upturning two contiguous flaps from the substance of an insole, and additional means for pressing the adjacent faces of said flaps into intimate contact during the cutting operation to form a single, compound lip, substantially as described.

20. An insole machine, having, in combination, means for cutting and upturning two contiguous flaps from the substance of an insole, and additional means acting intermittently on the flaps for pressing the adjacent faces of said flaps into intimate contact during the cutting operation to form a single, compound lip, substantially as described.

21. An insole machine, having, in combination, suitable operating instrumentalities, a yielding work support, an edge gage mounted to move with the support for engaging the edge of an insole upon the work support, a carrier on which the edge gage is mounted, and movable connections between the carrier and the frame of the machine to permit the edge gage to follow the yielding movements of the work support, substantially as described.

22. An insole machine, having, in combination, suitable operating instrumentalities, a yieldingly mounted work support and an independently mounted edge gage engaging the work support and arranged to follow the yielding movements of the work support so as to maintain the proper operative relation therewith, substantially as described.

23. An insole machine, having, in combination, a work support, means for cutting and turning up a portion of the substance of the insole to form a lip, a hammer acting on the inner surface of the lip for fixing the lip in upturned position, and means for actuating the hammer independently of the cutting means in a direction substantially parallel to the surface of the insole, substantially as described.

24. An insole machine, having, in combination, means for forming a lip on an insole, an edge gage for determining the distance of the lip from the edge of the insole, manually-operated means for changing the position of the edge gage, an adjustable stop for the said means, and independent adjusting means for adjusting the position of the edge gage, substantially as described.

25. An insole machine, having, in combination, means for forming a lip on an insole, an edge gage for determining the distance of the lip from the edge of the insole, a hand lever for moving the gage, a latch connected with and operated by the hand lever, and an adjustable stop engaged by the latch to determine one position of the hand lever and the gage, substantially as described.

26. An insole machine having, in combination, a knife carrier, a channel knife and

a slitting knife carried thereby, a yielding work support, means for feeding the work, and means for vibrating the knife carrier in the direction of the feed, substantially as described.

27. An insole machine, having, in combination, means for cutting and upturning two contiguous flaps from the substance of an insole, and an independently mounted vibratory hammer for pressing the adjacent faces of said flaps into intimate contact during the cutting operation to form a single, compound lip, substantially as described.

28. An insole machine, having, in combination, two knives for cutting and upturning simultaneously two contiguous flaps from the substance of an insole, one of said knives having its shank extended in the line of cut, a hammer opposite said knife shank, and means to vibrate said hammer to press successive portions of the flaps, between the hammer and the knife shank, into intimate contact as the work is moved past the knives, substantially as described.

29. An insole machine, having, in combination, a work support, devices for cutting and upturning a lip from the face of the insole, a lip hammer at the inside of the lip so formed, independently mounted carriers for said devices and hammer, and actuating means for the hammer carrier to move the hammer in a direction to impart blows upon the inner surface of the lip and fix it in upturned position, substantially as described.

30. An insole machine, having, in combination, work feeding means, a knife for cutting and upturning a lip from the substance of the insole, a hammer for fixing the lip in upturned position, oscillating carriers for said knife and hammer, and means for oscillating said knife carrier in the line of feed and said hammer carrier across the line of feed, substantially as described.

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

ANDREW EPPLER.

Witnesses:
FARNUM F. DORSEY,
HORACE VAN EVERN.