W. C. MEYER.

INSEAM TRIMMING MACHINE.

APPLICATION FILED OCT. 3, 1910.

1,154,713.

Patented Sept. 28, 1915.

3 SHEETS—SHEET 1.

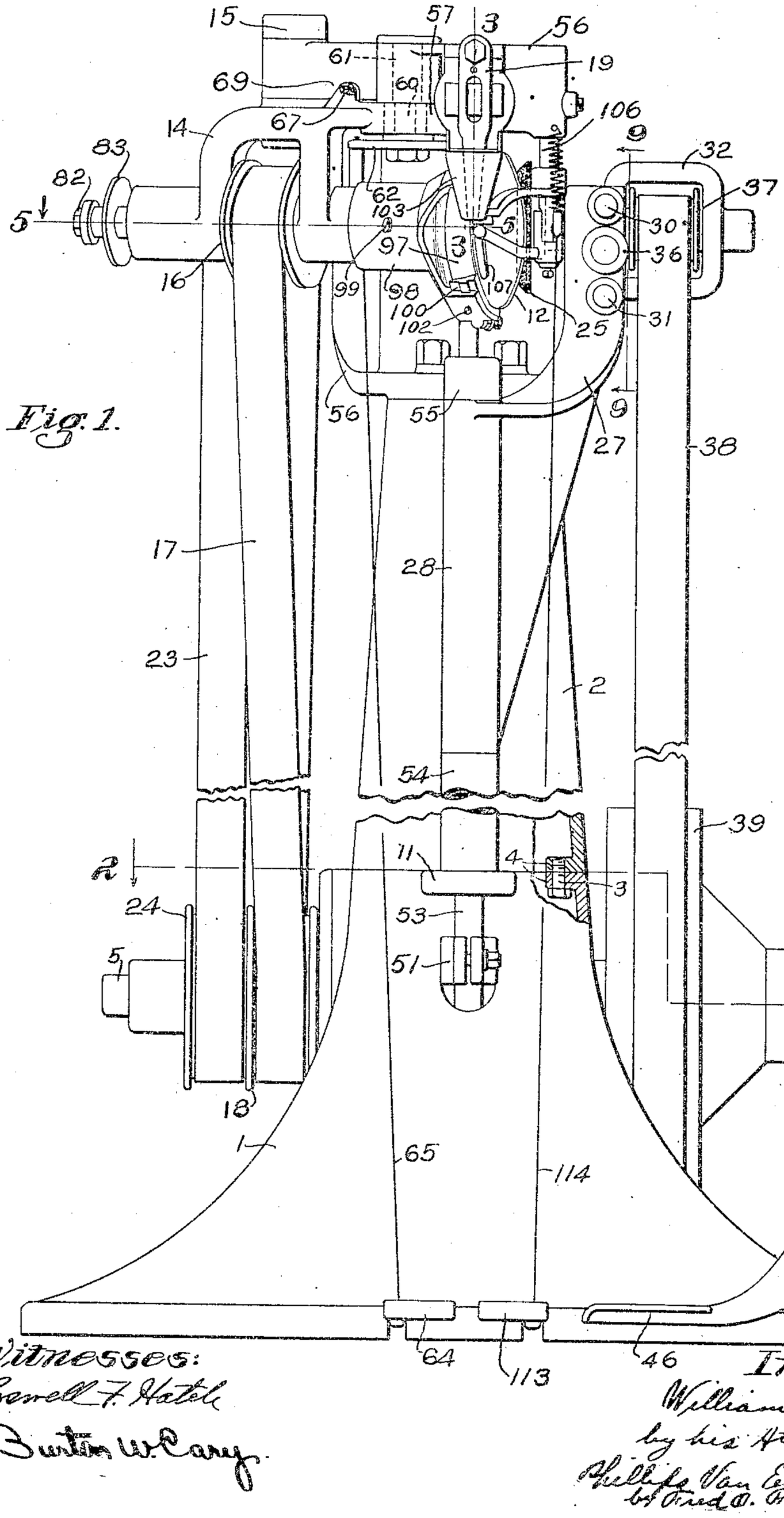

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

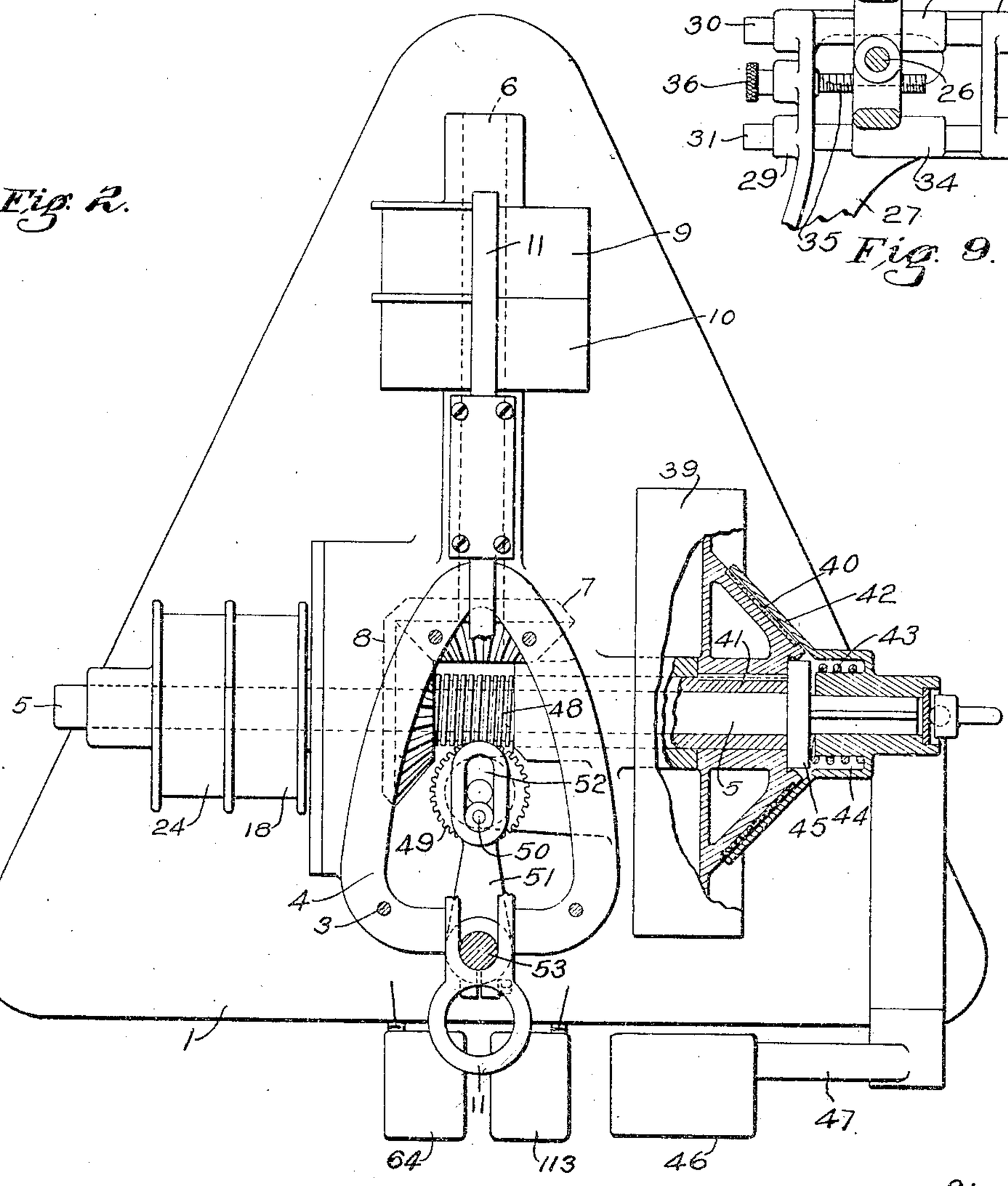
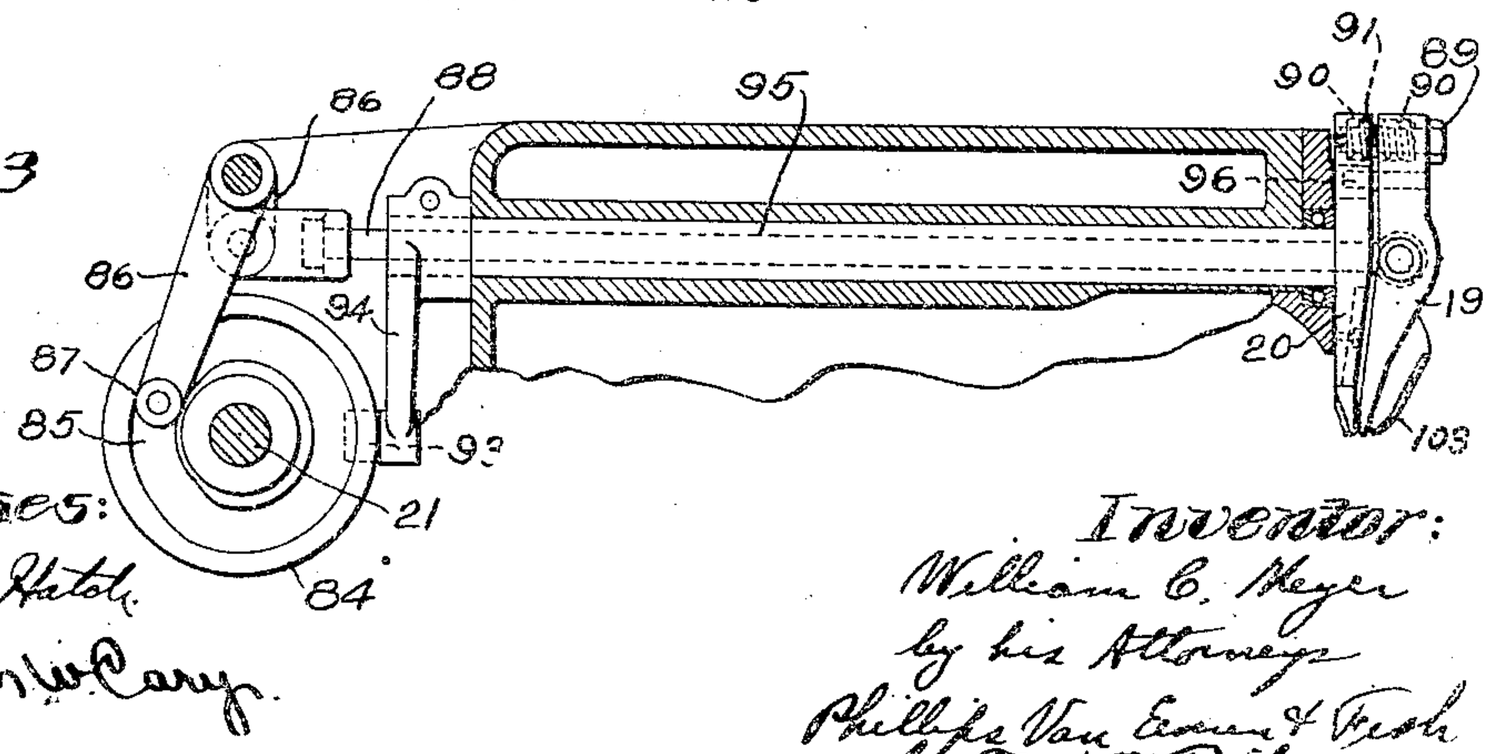


Fig. 9.

Fig. 3



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3 SHEETS—SHEET 3.

Fig. 4.

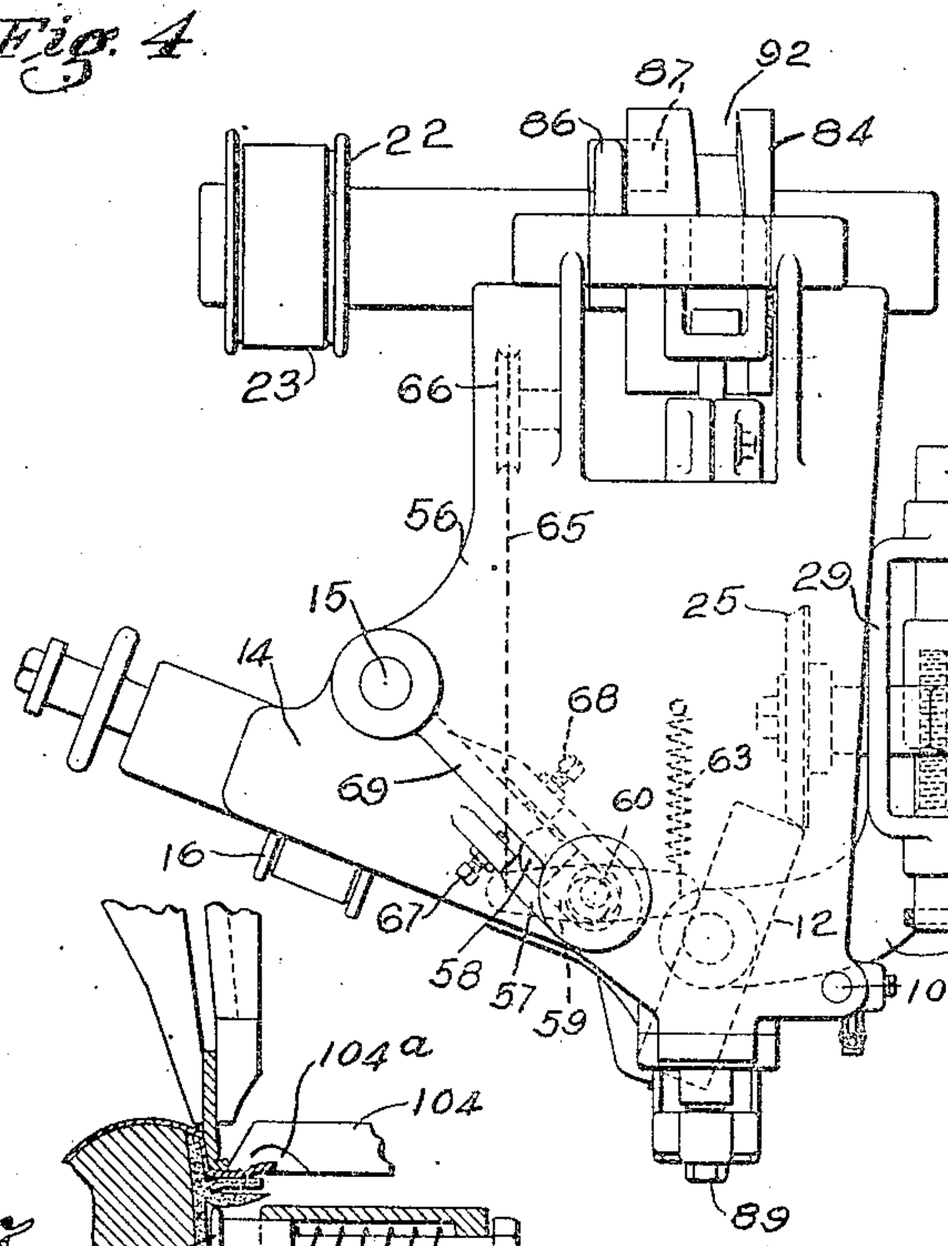


Fig. 8.

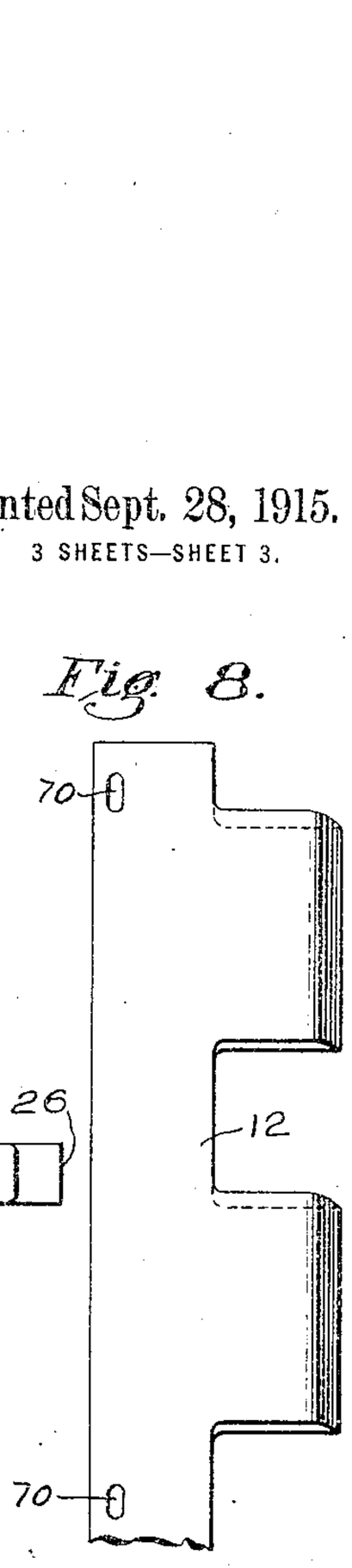


Fig. 7.

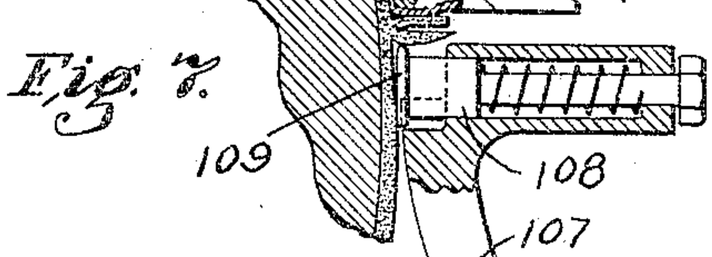


Fig. 5.

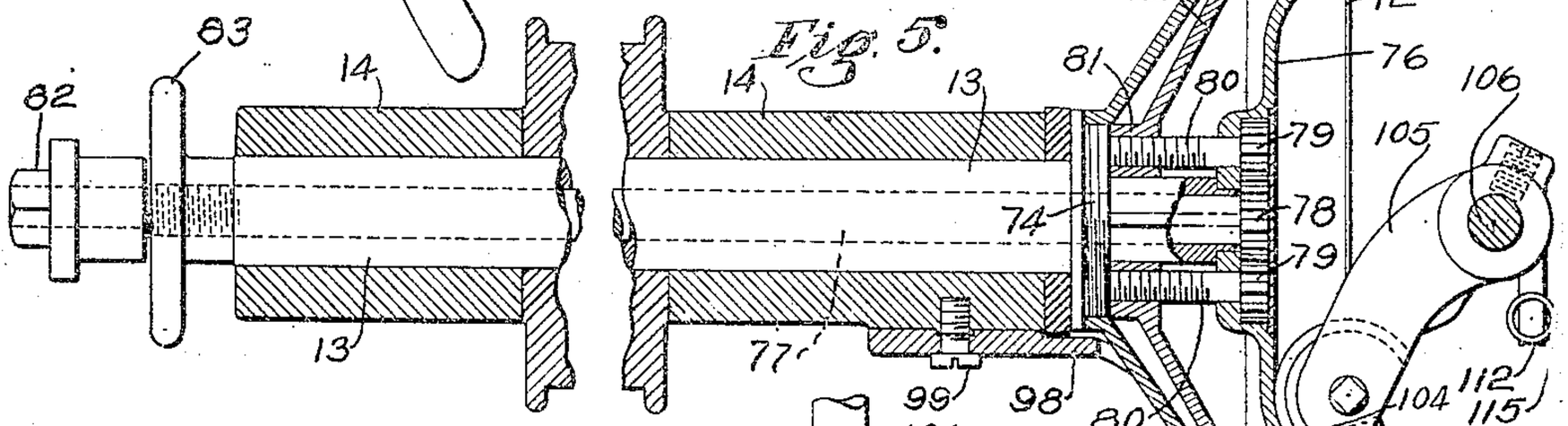
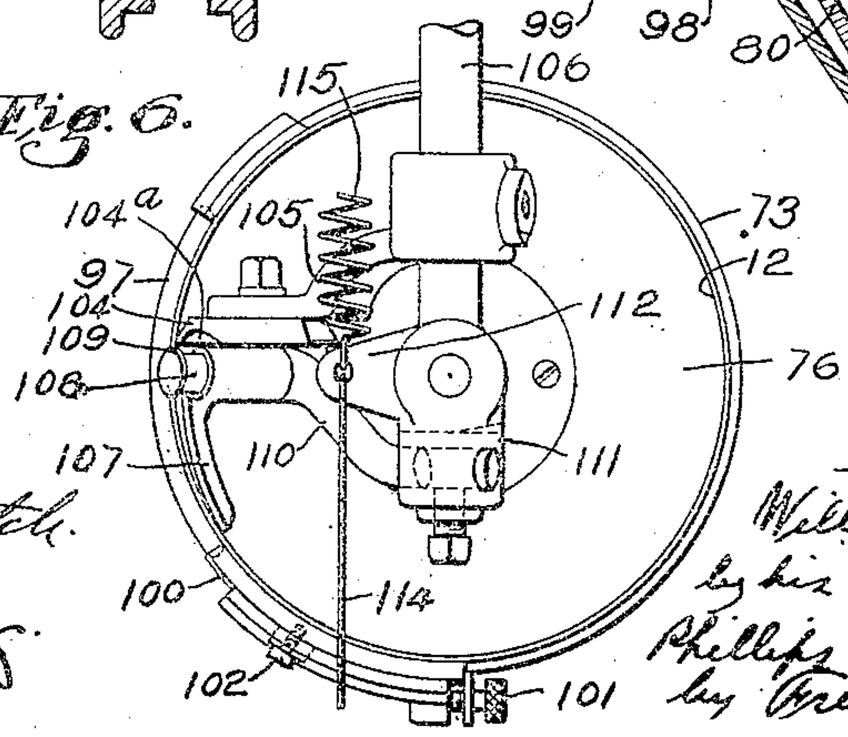


Fig. 6.



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UNITED STATES PATENT OFFICE.

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INSEAM-TRIMMING MACHINE.

1,154,713. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed October 3, 1910. Serial No. 585,028.

To all whom it may concern:

Be it known that I, WILLIAM C. MEYER, 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 Inseam-Trimming 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.

The present invention relates to certain new and useful improvements in inseam trimmers and more particularly to that type of machine which comprises a cylindrical trimming knife and vibrating work feeding jaws engaging opposite sides of the welt.

Machines of the type referred to, when run at high speed, are subject to considerable vibration which greatly increases the wear and tear upon the machines and impairs their efficiency. Difficulty is also experienced in this type of machine in maintaining the trimming knife properly sharpened and in producing an edge which will trim the inseam properly and not burn the sole of the shoe. There is furthermore danger of gouging the insole and cutting the stitches of the inseam when the machine is operated by an unskilled operator.

One object of the present invention is to reorganize and improve machines of this character in order to reduce the vibration to a minimum and thereby increase the efficiency and durability of the machine. With this object in view certain features of the invention contemplate certain improvements in the relative arrangement of the vibrating feeding jaws and trimming knife and in the construction of the feeding jaws and their actuating mechanism.

A further object of the invention is to produce an edge upon the trimming knife which will properly trim the inseam without burning the sole of the shoe. With this object in view, a feature of the invention contemplates the provision of means for grinding a convex bevel at the edge of the trimming knife to afford a clearance which prevents the knife from contacting with the sole along the entire surface of the beveled cutting face.

A still further object of the invention is to provide an improved type of trimming knife which may be easily adjusted as the knife is ground away and readily replaced when worn out. With this end in view a band knife is employed which is bent into a cylindrical form and means are provided for adjusting the knife in its carrier to present the cutting edge in proper relation to the work as the knife is ground away.

Still further objects of the invention are to provide improved means under control of the operator for regulating the depth of cut made by the trimming knife and to improve the construction and arrangement of the guides which control the movement of the work in order to more efficiently operate upon the shoe and minimize the danger of cutting the operator.

Still further novel and improved features of the invention will be fully described in the accompanying specification and defined in the appended claims.

In the accompanying drawings illustrating the preferred form of the invention, Figure 1 is a front elevation of the improved inseam trimming machine; Fig. 2 is a section upon the line 2—2 of Fig. 1 looking down in the direction of the arrows; Fig. 3 is a detail section upon the line 3—3 of Fig. 1 showing the operating mechanism for the feed jaws; Fig. 4 is a detail showing a plan view of the upper portion of the machine including the trimming knife and grinder therefor; Fig. 5 is a section upon the line 5—5 of Fig. 1 looking in the direction of the arrows; Fig. 6 is a detail showing a front elevation of the trimming knife and guides coöperating therewith; Fig. 7 is a detail showing a section of the shoe and the guides and feed jaws for gripping the welt and retaining the shoe in proper relation to the trimming knife; Fig. 8 is a detail of the band knife employed as the trimming knife; and Fig. 9 is a detail section upon the line 9—9 of Fig. 1, illustrating the mechanism for adjusting the position of the grinding disk with relation to the trimming knife.

In the illustrated embodiment of the invention shown in the drawings, the machine is mounted upon any preferred form of base 1 to which is attached a column 2 by means of the bolts 3 and flanged connections 4. The main driving shaft 5 is journaled in the base of the machine and driven from a jack shaft 6 through the beveled gears 7 and 8 respectively. The jack shaft 6 is provided with tight and loose pulleys 9 and 10 con-

trolled by any convenient form of belt shipper 11. The cylindrical trimming knife 12 is fixed to a shaft 13 journaled in a yoke 14 pivotally supported at 15 in the upper portion of the machine frame. The trimming knife is continuously rotated during the operation of the machine by a pulley 16 fixed to the shaft 13 and driven by a belt 17 from the pulley 18 fastened upon the driving shaft 5. The feed jaws 19 and 20 are operated from a cam shaft 21 journaled in the upper rear portion of the machine frame, and provided with a pulley 22 driven by a belt 23 from a pulley 24 fixed upon the main driving shaft 5.

In order to back off the edge of the trimming knife, a rotary grinding disk is mounted adjacent to the edge of the trimming knife, and is pivotally supported to oscillate about an axis substantially at right angles to the axis about which the trimming knife rotates and mechanism is provided for automatically producing a slow oscillation of the grinding disk. The grinding disk indicated at 25, is fixed upon a shaft 26 which is pivotally supported with its longitudinal axis inclined to the longitudinal axis of the shaft 13. The grinding disk is supported by a curved arm 27 pivotally mounted upon the front portion of the machine frame and having a yoke-shaped frame 29 formed upon its upper end. The frame 29 is provided with parallel rods 30 and 31 which support a frame 32 having sleeves 33 and 34, mounted upon the rods 30 and 31 respectively. The grinding shaft 26 is journaled in the frame 32 and moves with the frame when the frame is adjusted longitudinally of the yoke to bring the grinding wheel into engagement with the trimming knife. The frame 32 carrying the shaft 26 and grinder 25 is adjusted longitudinally of the yoke 29 by a knurled screw 35 rotatably mounted in the yoke 29 and fixed against longitudinal movement relatively thereto, the threaded end of the screw engaging with the frame 32. The knurled head 36 of the screw 35 is located in a conveniently accessible position in order that the operator by turning it may adjust the position of the grinding disk relatively to the trimming knife as the edge of the trimming knife is ground away.

The shaft 26 is rotated by a pulley 37 fixed thereto and driven through a belt 38 from the large drive pulley 39 loosely sleeved on the main driving shaft 5. The drive pulley 39 is provided with a conical clutch face 40 and is keyed to the sleeve 41 loosely mounted upon the shaft 5. A coacting clutch face 42 is mounted upon the shaft 5 and splined thereto, the two clutch faces being normally held out of engagement with one another by a coiled spring 43 seated in a recess 44 formed in the hub of the clutch face 42 and bearing against an annular flange 45 formed upon the shaft 5. A treadle 46 formed upon the lower end of a bell crank lever 47 operates to slide the clutch face 42 longitudinally against the action of the spring 43 and cause the grinding disk to be rotated. A worm 48 is cut upon the outer end of the sleeve 41 and meshes with a worm gear 49 having a crank pin 50 projecting from one face. A rotation of the worm gear 49 oscillates an arm 51 through the crank pin 50 engaging with a slot 52 formed in the arm 51. The lever arm 51 is rigidly attached to the lower end of a shaft 53 which is journaled in bearings 54 and 55 formed in the machine frame and supports the arm 27 through its connection with the sleeve 28 which is rigidly fastened to the shaft 53. The oscillations of the arm 51 are thus transmitted to the arm 27 and to the grinding disk 25. The grinding disk and its supporting arm 27 are normally at rest. When it is desired to sharpen the knife the treadle 46 is depressed and by means of the mechanism above described, the grinding wheel is rotated to sharpen the knife and is oscillated to back off the beveled edge of the knife.

In the heavier grades of welt shoes, more especially men's Goodyear shoes where a heavy thick welt is employed, the welt is puckered at the toe of the shoe and forms a thick inseam which stands out from the surface of the insole. It is desirable that the trimming knife shall not be allowed to cut as closely to the surface of the sole at this point as is done when trimming the inseam at the other points along the fore part and shank of the shoe, as otherwise the stitches of the inseam may be cut and the shoe injured. In order to overcome this difficulty, the trimming knife of the machine illustrated in the drawings is mounted for lateral movement and mechanism is provided, under control of the operator, for moving the trimming knife away from the work support and feed jaws and reducing the depth of cut when so desired. This feature can, of course, be employed to advantage in any situation where it is desired to reduce the depth of cut for any reason whatsoever. As stated previously, the trimming knife 12 and shaft 13 are supported in a frame 14 pivotally mounted at 15 in the upper portion of the head casting 56 which is detachably mounted upon the upper end of the column 2. A horizontal plate 57 projects laterally from the upper end of the frame 14 and has a slot 58 formed therein. A slide block 59 is supported in the slot 58 and has seated therein an eccentric 60 which is mounted upon the lower end of a stud shaft 61 journaled in the upper portion of the head casting 56. A lever 62 is fastened centrally upon the lower end of the stud shaft 61 and is adapted, upon oscillation, to par-

tially rotate the eccentric 60 and move the supporting frame 14 and knife 12 to a slight extent about the pivot 15. A tension spring 63 is fastened to one end of the lever 62 and tends to turn the lever in a direction to retain the trimming knife in a position in which the greatest possible depth of cut will be secured. The opposite end of the lever 62 is connected with a treadle 64 by a cord 65 running over a pulley 66, the arrangement being such that a downward movement of the treadle 64 by the operator will turn the lever 62 and partially rotate the eccentric 60 to move the trimming knife back to a slight extent and reduce the depth of the cut. The movement of the frame 14 is limited by a pair of stop screws 67 and 68 which are threadedly mounted in the frame 14 upon opposite sides of a downwardly projecting rib 69 integral with the head casting 56. The screws 67 and 68 are adjustable in order to vary the amount which the trimming knife 12 may be moved in either direction.

To enable the trimming knife to be easily replaced when worn out and in order to cheapen the cost of the manufacture, the trimming knife comprises a band knife 12 which is bent into a cylindrical form and held in position by a plurality of slots 70 formed adjacent to the rear edge of the band knife. The slots 70 operatively engage a plurality of studs 71 projecting from a supporting member or spider 72 which is keyed to the shaft 13. An outer guard or retaining member 73 is threaded upon an annular shouldered flange 74 attached to the shaft 13, and is provided with a laterally projecting portion 75 which extends over and surrounds the outer periphery of the band knife and serves to retain it in position upon the spider. The band knife 12 is supported upon the inside of its periphery by a retaining member 76 which is fixedly mounted upon the outer end of the shaft 13 and is provided with an outer supporting face engaging the inner surface of the knife and extending in close proximity to the cutting edge. The retaining member 76 in addition to supporting the outer edge of the knife, acts as a guard to close the end of the knife and leave only a shallow space in which the severed material does not readily collect. It is desirable that means be provided for adjusting the position of the band knife as the edge is ground away in order to avoid replacing the old knife with a new one until the edge of the old knife has been completely worn away. Means are accordingly provided for securing a longitudinal movement of the band knife 12 relatively to the guard 73 and retaining member 76 in order to present a new cutting edge to the work. The shaft 13 is tubular and a smaller shaft or rod 77 is seated in the bore of the shaft 13 and projects outwardly from it at either end. The shaft 77 carries upon its projecting end, adjacent to the trimming knife, a driving pinion 78 which engages with a plurality of gears 79 fixedly mounted upon the outer ends of screws 80 which are journaled in the hub of the retaining member 76. The screws 80 threadedly engage the hub 81 of the spider 72 and upon rotating the screws the spider 72 and band knife carried thereby will be moved relatively to the retaining member 76 and guard 73. The opposite end of the shaft 77 is provided with a nut 82 adapted to receive a wrench by which the shaft 77 may be turned and the band knife accordingly adjusted. The shaft 77 is locked against rotation relatively to the shaft 13 by a hand wheel 83 threadedly mounted upon the shaft 77 and adapted to contact with the outer end of the shaft 13. The band knife 12 may be of any convenient form but is preferably provided with a toothed edge as shown, as it is found that this type of edge operates more efficiently and is not dulled so quickly under varying conditions of work as are the other types of knife.

The means for feeding the work comprise a pair of feed jaws which first move together to grip the welt, then move laterally to feed the work, and then open and move back to their original position. These jaws are operated by a cam 84 mounted upon the cam shaft 21. The cam 84 is provided with a face cam 85 which operates to open and close the jaws through a bell crank 86 having a cam roll 87 upon one arm engaging with the face cam 85 and having its opposite arm connected to a connecting rod 88 which is pivotally attached at its outer end to the jaw 19. The rod 88 passes loosely through the jaw 20 so that the opening and closing of the two jaws is accomplished entirely by the movement of the jaw 19. The jaws 19 and 20 are held together at their upper ends by a bolt 89 passing through the jaw 19 and threadedly engaging with the jaw 20. Each of the jaws 19 and 20 are recessed at 90 and a coiled spring 91 is seated in the recesses surrounding the bolt. This construction forms practically a pivotal connection which enables the jaws 19 and 20 to be oscillated relatively to one another about their upper ends, while the spring 91 allows the jaws to grip the welt with a yielding pressure and automatically accommodate themselves to welts of different thicknesses. The feeding movement of the jaws 19 and 20 is obtained from a peripheral cam groove 92 cut in the cam 84, in which is seated a cam roll 93 mounted upon the free end of an arm 94. The arm 94 is rigidly attached to a hollow shaft 95 surrounding the rod 88 and supporting

upon its outer end the feed jaw 20. The jaw 20 is connected to the jaw 19 by a stud 96, carried by the jaw 19 and engaging a slot in the jaw 20, so that as the jaw 20 is oscillated by the rocking of the shaft 95 to feed the work, the jaw 19 is compelled to move with it. The distance between the free ends of the feed jaws 19 and 20 may be adjusted by turning the bolt 89.

The feeding jaws firmly grip the welt and feed the shoe with certainty without straining the welt away from the shoe upper or injuring the shoe in any way, and by reason of their construction and pivoted arrangement, which permits them to oscillate instead of reciprocate in feeding the work, they can be operated at a high rate of speed.

The axis of the hollow shaft 95 is arranged obliquely with relation to the axis of the trimming knife so that the feeding jaws act to feed the shoe with its sole in a plane extending from the cutting edge obliquely away from the axis of the knife. This tends to relieve the pressure of the work against the beveled edge of the knife so as to still further decrease the tendency of the knife to burn the shoe and also facilitates the feeding of the work. Also the oblique arrangement of the axis of the knife with relation to the plane of the shoe sole brings the mechanism for supporting and actuating the knife out of the way of the operator and gives a free space back of knife in which to manipulate the shoe.

The sole of the shoe is guided as it passes before the trimming knife by a plurality of guides which allow the trimming knife to cut very closely to the stitches of the inseam and at the same time effectually prevent the knife from gouging into the sole and cutting the stitches of the inseam. The sole is guided immediately beyond the edge of the trimming knife by a spring guide 97 which is supported upon the outer end of a bracket 98 attached to the yoke 14 by a screw 99. The spring 97 is supported at its ends in the bracket 98 and is adjusted or bowed outwardly to vary its distance from the edge of the trimming knife by a dove-tail slide block 100 which supports one end of the spring, the slide block being adjusted by a thumb screw 101 and held in any adjusted position by a set screw 102. By adjusting the slide block 100 and bowing out the spring guide 97 the distance of the guide from the edge of the trimming knife can readily be varied and the depth of cut regulated as desired. The proper relative adjustment of the guard and knife in the direction of the feed is secured by adjustment of the knife between the retaining members 75 and 76. The height at which the shoe is held is regulated by a crease guide 103 which is rigidly mounted upon the head casting 56 adjacent to the feed jaw 19. The crease guide 103 bears upon the shoe at the junction of the upper and welt and the operator is required to hold the work up against the crease guide during the entire operation of trimming the inseam. In order that the inseam may be made to stand out from the sole of the shoe, a guide 104 is arranged to bear upon the edge of the welt at the side of the upper. This guide is located inside of the periphery of the knife and extends beyond the cutting edge as clearly shown in Fig. 5. In order to enable the guide 104 to operate to better advantage upon the shoe upper, an edge turning or edge lifting recess 104[a] is formed in the lower face of the guide, as shown clearly in Fig. 7. The guide 104 is shaped to correspond to the contour of the retaining member 76, as shown clearly in Fig. 5, and is supported upon the end of an arm 105 which is mounted upon a vertical shaft 106. The guide fits closely to the surface of retaining member 76 and extends radially toward the center of the knife so that in addition to serving as a guide for the work, it acts as a clearer to free the interior of the knife of the severed material. The shaft 106 is mounted at its upper end in the head casting 56 and is secured in position by a set screw. A sole guide 107 is mounted below the guide 104 and is curved to correspond to the periphery of the trimming knife. This guide supports the sole of the shoe just prior to its engagement with the edge of the trimming knife and is provided at its upper portion with a spring pressed roller pin 108 which has an annular rib 109 upon its outer face adapted to engage with the under-side of the substance forming the inseam and press it upwardly against the guide 104. The sole guide 107 is formed upon an arm 110 adjustably secured in a block 111 which is pivotally mounted upon the lower end of the shaft 106. An arm 112 projects outwardly from the block 111 and is connected at its outer end to the treadle 113 through a flexible connection 114. Upon depressing the treadle 113, the block 111 will be oscillated to move the sole guide 107 downwardly releasing the work held between the pin 108 and guide 104. A tension spring 115 is connected to the outer end of the arm 112 and tends to normally hold the sole guide 107 in operative position in engagement with the work. By loosening the set screw which holds the shaft 106 in position, the shaft and the parts carried thereby may be removed so as to afford free access to the knife.

By means of the several guides above described, the shoe is guided properly as it is fed to the trimming knife, and the inseam is held up in position to be trimmed by the knife, and is supported so as to be trimmed cleanly and evenly without any liability of injury to the stitches.

While it is preferred to employ the construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not material to the invention except so far as it is specified in the claims, and may be varied and modified without departing from the broader features of the invention.

Having explained the nature and object of the invention, and specifically described one form of machine in which it may be embodied, what is claimed is:—

1. An inseam trimming machine, having in combination, a trimming knife, means for feeding the shoe, a rotary shaft supporting the trimming knife, a frame pivotally supported upon the machine frame and having a slotted horizontal plate projecting therefrom, the frame having the shaft journaled therein, a slide block seated in the slot, a rotary stud shaft mounted in the machine frame and having an eccentric portion engaging with the slide block, means under control of the operator for rotating the stud shaft in one direction, and means for automatically rotating the stud shaft in the opposite direction whereby the trimming knife may be moved to reduce the depth of cut and returned automatically to its normal position, substantially as described.

2. An inseam trimming machine, having, in combination, a rotary trimming knife, a guide overlying the knife beyond the cutting point, and means for adjusting the guide relatively to the cutting edge of the trimming knife to vary the depth of cut made by the trimming knife, substantially as described.

3. An inseam trimming machine, having in combination, a rotary trimming knife, a shaft supporting the trimming knife, means for feeding the shoe, a flat spring guide supported adjacent the cutting edge of the trimming knife, a stationary bracket retaining the opposite ends of the flat spring in position, and means mounted on the bracket for relatively moving the ends of the spring to secure different degrees of curvature of the spring and vary the distance between the spring guide and the cutting edge of the trimming knife, substantially as described.

4. An inseam trimming machine, having in combination, a rotary trimming knife, means for feeding the shoe, a guide mounted rigidly upon the machine frame and adapted to bear upon the upper side of the inseam, and a sole guide supported to oscillate in a vertical plane and having a spring pressed pin adapted to bear upon the under side of the inseam beneath the channel flap, substantially as described.

5. An inseam trimming machine, having in combination, a rotary trimming knife, means for feeding the shoe, a guide rigidly mounted upon the machine frame and adapted to bear upon the upper side of the inseam, the guide being provided with an edge lifting recess in its lower or working face adjacent to the projecting inseam, and a sole guide mounted below the first guide and adapted to bear upon the sole and the under side of the inseam, substantially as described.

6. An inseam trimming machine having a rotary trimming knife, a shaft supporting the trimming knife, a supporting member upon which the trimming knife is detachably mounted, a plurality of retaining members for maintaining the trimming knife upon the supporting member, and means for moving the supporting member relatively to the retaining members to present a new cutting edge to the work as the trimming knife is worn away under repeated use, substantially as described.

7. An inseam trimming machine comprising a band knife bent into a cylindrical form, a spider upon which the band knife is detachably mounted, a rotary shaft to which the spider is fixed, a guard surrounding the outer periphery of the band knife and retaining it in position upon the spider, a retaining member engaging the inner face of the band knife, and means for securing a longitudinal movement of the spider relatively to the guard and retaining member in order to present a new cutting edge to the work as the trimming knife is worn away under repeated use, substantially as described.

8. An inseam trimming machine comprising a band knife, a spider upon which the band knife is detachably mounted, a hollow rotary shaft supporting the spider, a guard fixedly mounted upon the shaft surrounding the outer periphery of the trimming knife, a retaining member engaging the inner face of the trimming knife, a shaft seated in the hollow rotary shaft, a plurality of screws journaled in the retaining member and threadedly engaging the spider, and means operatively connecting the second shaft with the plurality of screws whereby a rotation of the second shaft relatively to the first shaft will rotate the screws and secure a longitudinal movement of the spider and trimming knife relatively to the guard and retaining member, substantially as described.

9. An inseam trimming machine, having, in combination, a cylindrical trimming knife, means for feeding and guiding the shoe, a grinding device, and means for actuating the grinding device to grind a convex bevel at the edge of the knife, substantially as described.

10. An inseam trimming machine, having in combination, a rotary trimming knife, means for feeding the shoe, means for guiding the shoe, and a rotary grinder supported

with its axis inclined to the axis of the trimming knife and adapted to oscillate about an axis substantially at right angles to the axis of the trimming knife, substantially as described.

11. An inseam trimming machine, having in combination, a rotary trimming knife, means for feeding the shoe, means for guiding the shoe, a rotary grinding disk pivotally supported upon the machine frame for oscillatory movement axially of the knife, means for rotating the grinding disk, means for securing a slow oscillation of the grinding disk, and means under control of the operator for simultaneously discontinuing both of said movements, substantially as described.

12. An inseam trimming machine, having in combination, a rotary trimming knife, means for feeding the shoe, means for guiding the shoe, a main driving shaft, a rotary grinder pivotally mounted upon the machine frame and driven from the main driving shaft, an arm supporting the grinder, a clutch member loosely mounted upon the driving shaft and operatively connected to the grinder, a sleeve supported upon the shaft and locked to the clutch member, a crank operatively connected with the arm and adapted to be oscillated upon rotation of the sleeve, a second clutch member locked to the main driving shaft and adapted to simultaneously rotate and oscillate the grinder upon engagement with the first clutch member, and means under control of the operator for moving the two clutch members into operative engagement with one another, substantially as described.

13. An inseam trimming machine, having, in combination, a rotary trimming knife, means for guiding and feeding the shoe comprising a jaw for engaging the lower face of the welt, mechanism for oscillating the jaw about an axis substantially at right angles to the direction of the feed, a second jaw for engaging the upper face of the welt connected to oscillate with the first jaw, and mechanism for moving the second jaw toward and from the first jaw to intermittently grip the welt, substantially as described.

14. An inseam trimming machine, having in combination, a rotary cylindrical trimming knife, means for guiding the shoe, means for feeding the shoe comprising a pair of feed jaws pivotally connected at their upper ends, means for oscillating both jaws simultaneously in the longitudinal plane of the work, and means for oscillating the jaws relatively to one another to open and close the jaws, substantially as described.

15. An inseam trimming machine, having in combination, a rotary cylindrical trimming knife, means for feeding the shoe, means for guiding the shoe, and a grinding device for grinding the edge of the knife mounted to move about an axis in a plane substantially perpendicular to the axis of the knife, substantially as described.

16. An inseam trimming machine, having in combination, a rotary cylindrical trimming knife, means for feeding the shoe, means for guiding the shoe, a grinding device for grinding the edge of the knife, and means acting automatically to oscillate the grinding device about an axis in a plane substantially perpendicular to the axis of the knife, substantially as described.

17. An inseam trimming machine, having, in combination, a rotary cylindrical trimming knife, means for guiding the shoe, and means for feeding the shoe with its sole in a plane extending from the cutting edge of the knife obliquely away from the axis of the knife, substantially as described.

18. An inseam trimming machine, having in combination, a rotary cylindrical trimming knife, means for guiding the shoe, feeding jaws arranged to intermittently engage opposite sides of the welt and feed the shoe with its sole in a plane extending obliquely from the cutting edge of the knife away from the axis of the knife and means for actuating the jaws, substantially as described.

19. An inseam trimming machine, having, in combination, a rotary trimming knife, means for guiding and feeding the shoe comprising a rock shaft, a jaw for engaging the lower face of the welt fixed to the end of the rock shaft, a second jaw for engaging the upper face of the welt connected to swing with and to move toward and away from the first jaw, and mechanism for rocking the shaft and actuating the second jaw, substantially as described.

20. An inseam trimming machine, having in combination, a trimming knife, means for guiding the shoe, a feeding jaw arranged to engage one side of the welt and pivotally mounted to oscillate in the line of feed, a feeding jaw coöperating therewith, an actuating rod pivotally connected to said coöperating jaw intermediate its ends, means for loosely supporting the outer end of said jaw upon the first mentioned jaw, and a spring interposed between the outer ends of the jaws to permit the jaws to yieldingly engage the welt, substantially as described.

21. An inseam trimming machine, having in combination, a trimming knife, and means for guiding the shoe including a sole guide provided with a yielding pin to engage the shoe sole inside of the inseam, substantially as described.

22. An inseam trimming machine, having in combination, a trimming knife, and means for guiding the shoe, comprising a roll arranged with one end directed toward the sole

of the shoe and arranged to engage the shoe inside of the inseam and means for yieldingly supporting the roll to permit it to move longitudinally toward and from the shoe sole, substantially as described.

23. An inseam trimming machine, having in combination, a rotary cylindrical trimming knife, and means for guiding the shoe, comprising a guide arranged to engage the shoe and extending inside of the knife and fitting closely thereto to act as a clearer for the trimmed material, substantially as described.

24. An inseam trimming machine, having in combination, a rotary cylindrical knife, and means for guiding the shoe comprising a guide arranged to engage the shoe in proximity to the edge of the knife and a removable support for the guide to expose the interior of the knife and allow free access thereto when removed, substantially as described.

25. An inseam trimming machine, having in combination, a rotary cylindrical knife, a guide for the shoe, arranged to engage the shoe in proximity to the cutting edge of the knife and a shaft for supporting the guide arranged at right angles to the axis of the knife in front of the knife, substantially as described.

26. An inseam trimming machine, having in combination, a trimming knife, means for feeding the shoe, and means for guiding the shoe comprising a guide arranged to bear upon the inner edge of the welt and provided with an edge lifting recess to engage the edge of the shoe upper, substantially as described.

27. An inseam trimming machine, having, in combination, a cylindrical trimming knife, and a guard plate supported in the line of feed beyond the cutting point and curved to follow the curvature of the knife edge, substantially as described.

28. An inseam trimming machine, having, in combination, a cylindrical trimming knife, a substantially concentric guard plate overlying the periphery of the knife immediately back of its edge at the cutting point and means for adjusting the plate, substantially as described.

29. An inseam trimming machine, having, in combination, a trimming knife, a guard spaced from the cutting point, means for relatively adjusting the guard and knife in the direction of feed, and means for relatively adjusting the guard and knife transversely of the feed to determine the depth of cut, substantially as described.

30. An inseam trimming machine, having, in combination, a trimming knife, a guide arranged to engage the outer side of the inseam and provided with an edge lifting surface, and a guide arranged to engage the inner side of the inseam, substantially as described.

31. An inseam trimming machine, having, in combination, a rotary cylindrical trimming knife, means for guiding the shoe, a guard plate located within the end of the knife and closing the end of the knife to prevent accumulation therein of the trimmed material, and a clearer fitting the guard adjacent to the cutting point, substantially as described.

32. An inseam trimming machine, having, in combination, a rotary cylindrical trimming knife, means for guiding the shoe, and a grinding device mounted to move axially of the knife in a curved path to grind a convex bevel at the edge of the knife, substantially as described.

33. An inseam trimming machine, having, in combination, a cylindrical trmming knife, means for feeding the shoe past the knife, a crease guide and a channel guide arranged to engage the shoe upon opposite sides of the inseam, and a stationary guard supported in the line of feed beyond the cutting point and arranged to engage the shoe bottom in close proximity to the cutting edge of the knife and prevent the knife from cutting into and injuring the shoe, substantially as described.

34. An inseam trimming machine, having, in combination, a cylindrical trimming knife, means for feeding the shoe past the knife, and guiding devices including a guard supported in the line of feed beyond the cutting point and having provision for adjustment to vary the depth of cut made by the knife, substantially as described.

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Witnesses:
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