E. E. WINKLEY.

SOLE LEVELING MACHINE.

APPLICATION FILED JUNE 4, 1904.

1,057,908.

Patented Apr. 1, 1913.

4 SHEETS—SHEET 1.

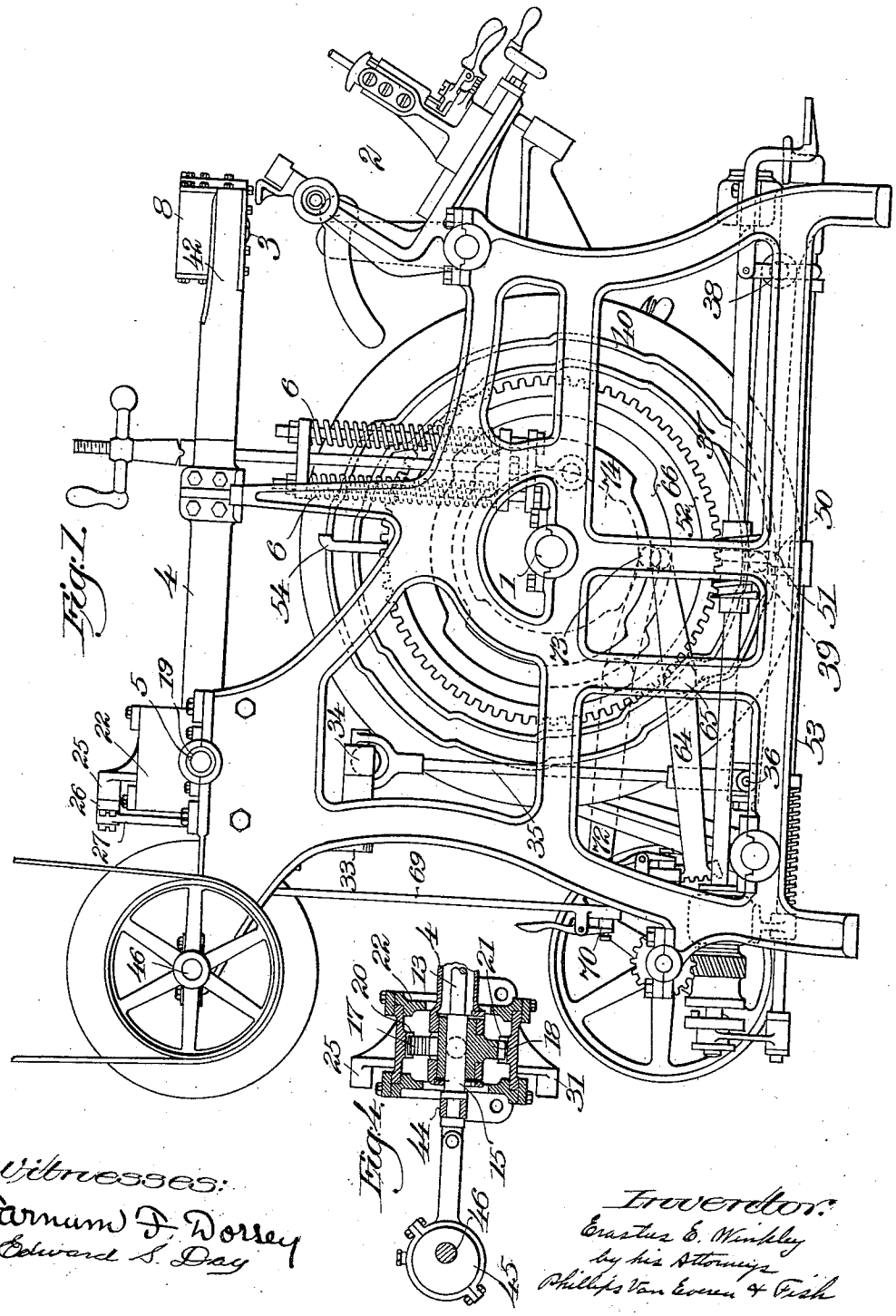

Fig. 1.

Fig. 4.

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Inventor:
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by his Attorneys
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4 SHEETS—SHEET 2.

Fig: 2.

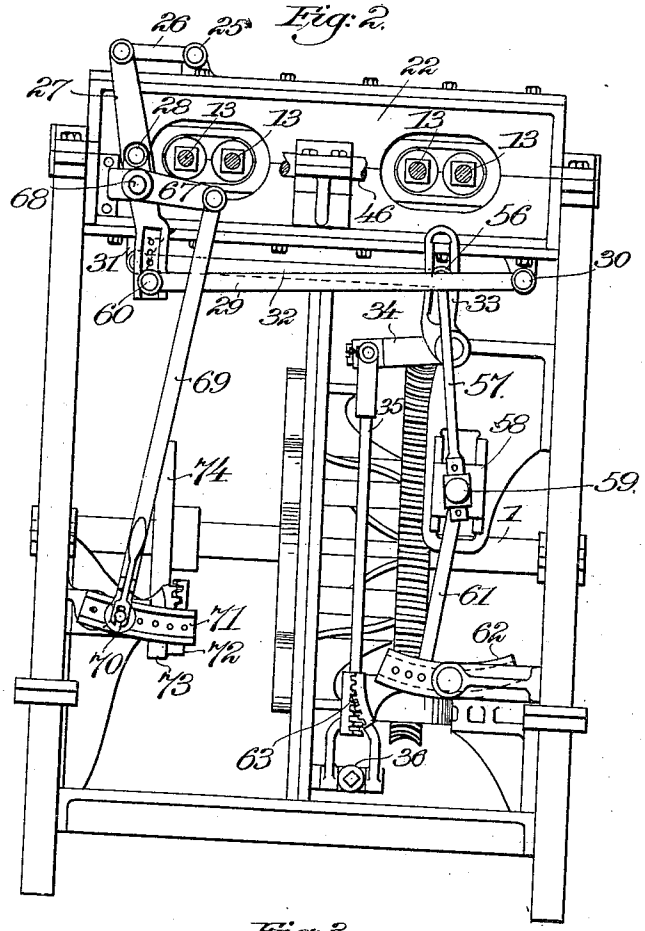
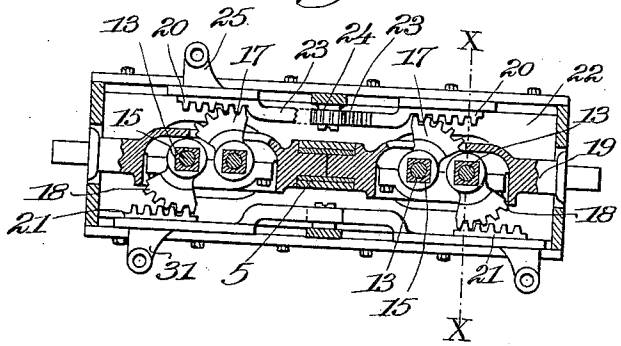


Fig: 3.



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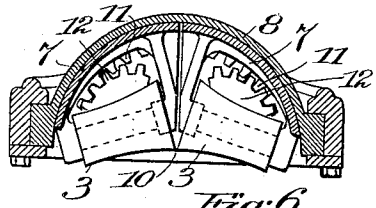

Fig. 6.

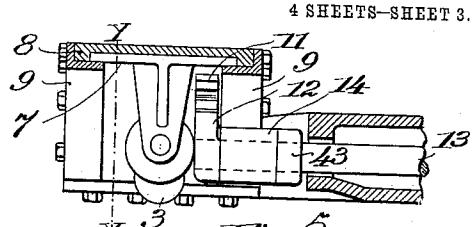

Fig. 5.

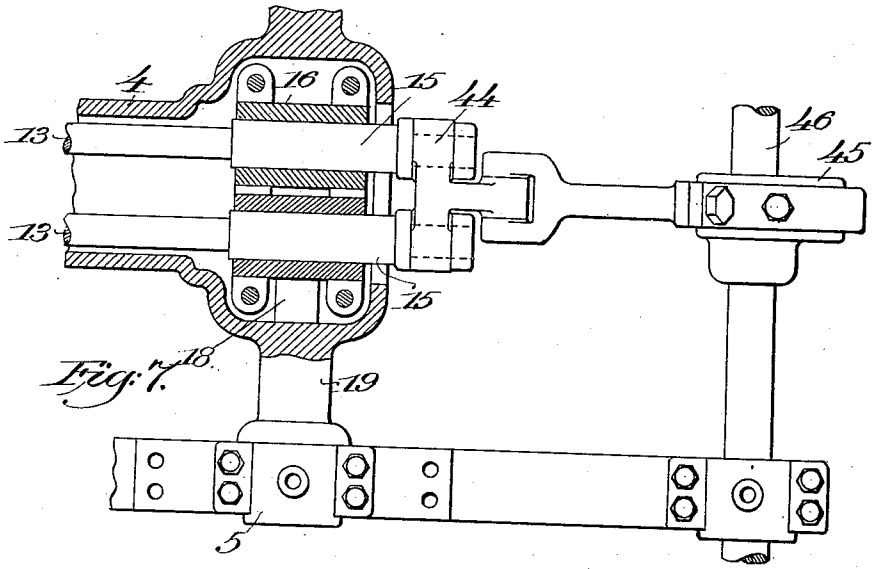

Fig. 7.

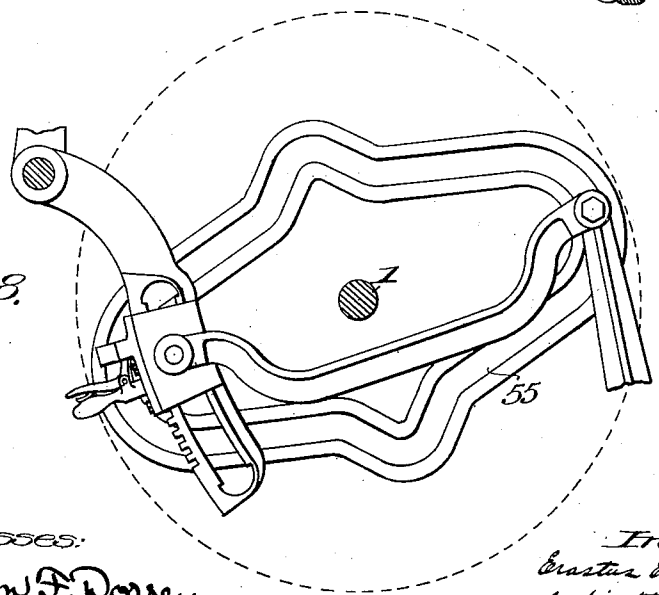

Fig. 8.

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4 SHEETS—SHEET 4.

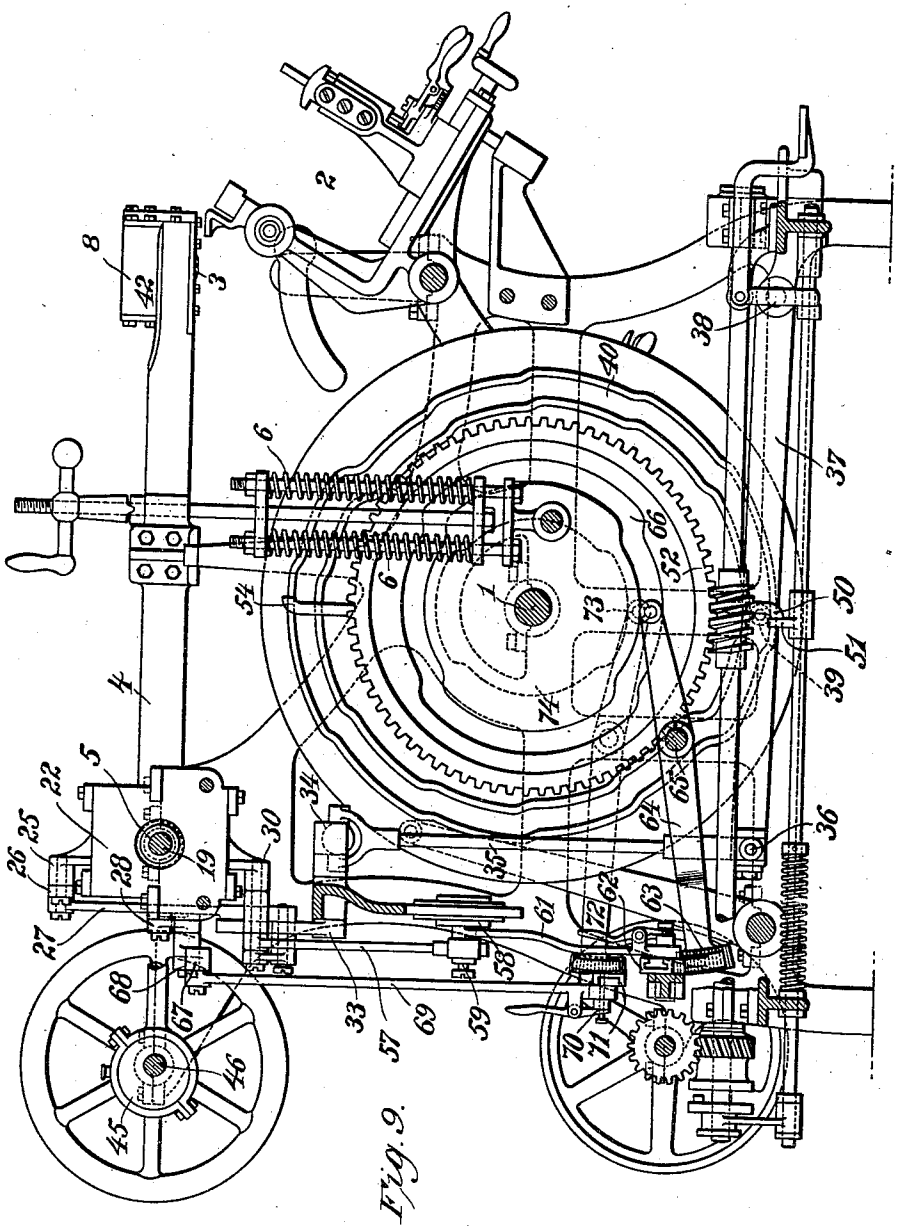

Fig. 9.

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UNITED STATES PATENT OFFICE.

ERASTUS E. WINKLEY, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOLE-LEVELING MACHINE.

1,057,908. Specification of Letters Patent. Patented Apr. 1, 1913.

Application filed June 4, 1904. Serial No. 211,118.

To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sole-Leveling 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 sole leveling machines and more particularly to sole leveling machines of that class in which the opposite sides of the sole of a shoe supported upon a jack are acted upon by two or more sole leveling rolls and in which a relative movement is imparted to the jack and rolls to cause the rolls to travel along the sole of the shoe.

The object of the present invention is to improve the construction and mode of operation of sole leveling machines comprising leveling rolls arranged to act upon the opposite sides of the sole of a shoe, and more particularly to provide such a machine in which the rolls can be so actuated as to properly level the sole and give it the desired shape.

A further object of the present invention is to provide a machine of the class referred to which is adapted for operation upon many different styles of shoes.

Further objects of the invention are to improve and simplify the construction and arrangement of the various parts of sole leveling machines of the class referred to with a view to rendering such machines more efficient in operation and capable of a wider range of use.

With the above objects in view, a feature of the present invention contemplates the provision, in a sole leveling machine comprising a shoe supporting jack and two rolls arranged to operate respectively on the opposite sides of the sole of a shoe supported upon the jack, of means for varying the inclination of the rolls during the leveling operation, and means for adjusting the inclination imparted to one of the rolls without changing the inclination imparted to the other roll.

The present invention also contemplates so constructing and arranging the means for varying the inclination of the rolls during the leveling operation that a greater change in the inclination of one roll can be made than in the inclination of the other.

The present invention also contemplates varying the inclination of one roll independently of the other during the leveling operation so that if desired the inclination of one roll can be changed to any extent regardless of any change in the inclination of the other roll.

The present invention also contemplates the provision of means whereby the inclination imparted to the rolls while acting on the shank portion of the sole can be adjusted independently of the inclination imparted to the rolls while acting on the forepart, and also means whereby the inclinations imparted to each roll while acting on the shank and forepart can be adjusted independently of the inclinations imparted to the other roll.

The features of invention above referred to are preferably embodied in a machine in which the inclinations of the rolls are varied during the leveling operation by automatically acting mechanism, as thereby the work produced by the machine is more uniform and also the machine can be run at a higher rate of speed and can be operated by an unskilled workman. It is to be understood, however, that, broadly considered, these features of invention can be embodied in a machine in which the inclination of the rolls is produced by mechanism actuated or controlled by the operator.

The provision of mechanism acting automatically to vary the inclination of the rolls during the leveling operation is believed to be broadly new and to constitute a feature of the invention whether or not the means for adjusting the rolls, above referred to, are provided, or the means for imparting a greater inclination to one roll than to the other, or the means for independently varying the inclination of the rolls.

In addition to the features of invention above referred to the present invention also consists in certain devices and combinations of parts hereinafter described and claimed,

the advantages of which will be obvious to those skilled in the art from the following description.

The various features of the present invention are embodied in their preferred form in the sole leveling machine illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the machine; Fig. 2 is a rear elevation with certain parts removed, illustrating a portion of the mechanism for varying the inclination of the leveling rolls; Fig. 3 is a detail sectional view illustrating another portion of the mechanism for varying the inclination of the rolls; Fig. 4 is a detail sectional view taken on the line *x*—*x* Fig. 3, illustrating the mechanism for varying the inclination of the rolls shown in said figure and also a portion of the mechanism for vibrating the rolls; Fig. 5 is a vertical longitudinal section of one of the roll carrying heads; Fig. 6 is a detail sectional view taken on the line *y*—*y* of Fig. 5; Fig. 7 is a detail plan view partly in section of a portion of the roll carrying and actuating mechanism showing particularly the mechanism for vibrating the rolls, Fig. 8 is a detail view illustrating in side elevation the jack actuating cam and a portion of the connections between the cam and the jacks and Fig. 9 is a view in side elevation of the machine similar to Fig. 1, but with a portion of the machine frame omitted to show underlying parts.

The machine illustrated in the drawings is similar in the construction and arrangement of many of its operating parts to the machine disclosed in applicant's prior patent for a sole leveling machine, No. 558,548, dated March 3, 1896, to which patent reference may be had for a complete disclosure of the construction, arrangement and operation of the parts not hereinafter specifically described. The machine is provided with two jacks and with two sets of sole leveling rolls coöperating respectively therewith. The operation of the machine is completely automatic, mechanism being provided for oscillating each jack to change the relative longitudinal position of the jack and the leveling rolls associated therewith, and for varying the lateral inclination of the rolls during the oscillating movement of the jack to cause the rolls to impart the desired shape to the sole of the shoe. Each jack can be connected to and disconnected from the jack actuating mechanism, and during the operation of the machine but one jack is connected to said mechanism at a time, so that while one jack is being oscillated beneath the set of leveling rolls associated therewith, the other jack remains stationary at the front of the machine in a position which allows the operator to readily remove a leveled shoe therefrom, and place another shoe thereon. To adapt the machine for operation upon both right and left shoes the mechanism for varying the inclination of the rolls is so constructed and arranged that one set of rolls is actuated to give the desired shape to the sole of a right shoe, and the other set of rolls is actuated to give a corresponding shape to the sole of a left shoe.

Referring to the drawings 1 indicates the cam shaft of the machine, which is driven and controlled by mechanism similar to that disclosed in the patent hereinbefore referred to. The shoe supporting jacks are indicated at 2, and are similar in construction and arrangement to the jacks illustrated in the patent hereinbefore referred to and are connected to and disconnected from the jack actuating mechanism in the same manner. The sole leveling rolls are indicated at 3, there being two rolls associated with each jack, and arranged to act respectively upon opposite sides of the sole of a shoe. The rolls act upon both sides of the sole simultaneously so that a less number of oscillations of the jack is required to complete the leveling operation than in the machine of applicant's prior patent, in which but a single leveling roll is used and in which the opposite sides of the sole of a shoe are leveled successively. In the machine illustrated in the drawings, the jack actuating cam is arranged to impart the necessary oscillations to a jack during a half revolution of the cam shaft 1, and consequently means are provided for automatically stopping the cam shaft after each half revolution. As illustrated these means consist of a dog 50 secured to the worm wheel 52 and arranged to engage an arm 51 on the clutch operating rod 53, as in the machine of applicant's prior patent, and a similar dog 54 secured to the worm wheel 52 diametrically opposite the dog 50, also arranged to engage the arm 51.

The jack actuating cam and a portion of the connections between the cam and the jacks are illustrated in Fig. 8, the connections between the cams and the jacks being the same as in the machine of applicant's prior patent. As shown in this figure, the jack actuating cam is arranged to impart to a jack during each half of its revolution, first, a comparatively long inward movement to cause the rolls to pass over the forepart and shank of the sole, then shorter outward and inward movements to cause the rolls to pass back and forth over the shank, and then a long outward movement to cause the rolls to again pass over the shank and forepart. The rolls thus pass twice over the forepart, and four times over the shank.

Each set of leveling rolls 3 is carried by a roll carrying bed 4 pivoted at 5 to the frame of the machine, and acted upon by springs

6 which force the rolls against the sole with the required leveling pressure, the arrangement of the roll carrying beds 4 and springs 6 being substantially the same as in the machine of applicant's prior patent.

In order to allow the lateral inclination of the rolls to be changed during the leveling operation the rolls of each set are journaled in cradles 7, as illustrated in Figs. 5 and 6, which are provided with curved bases bearing upon the inner surface of a roll carrying head 8 in which they are supported by flanges 9. The heads 8 are mounted in the roll carrying beds 4 as hereinafter described. The cradles 7 are mounted to slide within the heads, and thereby change the inclination of the rolls as will be apparent from an inspection of Fig. 6. The bases of the cradles and the inner surfaces of the heads 8 are curved in the arc of a circle, the center of which is located at the point 10 (Fig. 6), which point is at the meeting edges of the surfaces of the rolls in contact with the sole, so that these edges are not separated when the inclination of the rolls is varied, and thereby any liability of marring the sole at this point is avoided.

The cradles 7 are moved at the proper times during the leveling operation to vary the lateral inclination of the rolls, and cause the rolls to impart the required shape to the sole, and to this end each cradle is provided with a segmental gear 11 which meshes with a segmental pinion 12 fixed to a shaft 13, there being a shaft 13 and pinion 12 for actuating each cradle. The shafts 13 are supported in the roll carrying beds 4 and are journaled at their forward ends in cross-pieces 14 fixed to the heads 8.

The rear ends of the shafts 13, see Figs. 3 and 7, are provided with squared portions 15 engaging squared openings in the hubs 16 of segmental gears 17 and 18 journaled in the rock shafts 19 which are integral with the roll carrying beds 4, the shafts which actuate the outside rolls being in engagement with the segmental gears 18 and the shafts which actuate the inside rolls being in engagement with the segmental gears 17. The gears 17 and 18 (see Figs. 3 and 4) are engaged by racks 20 and 21 which are mounted to slide longitudinally in a housing 22 secured to the frame of the machine. The racks 20 are provided with racks 23 which engage opposite sides of a pinion 24 journaled in the housing 22, the construction being such that the racks are caused to reciprocate in unison but in opposite directions. The racks 21 are connected in a similar manner so that these racks are also caused to reciprocate simultaneously in opposite directions. The racks 20 and 21 are reciprocated by mechanism hereinafter described to rock the shafts 13 and thereby vary the lateral inclination of the leveling rolls during the leveling operation and by reason of the above described connections between the racks, the leveling rolls associated with one jack are so actuated as to level the sole of a right shoe and the leveling rolls associated with the other jack are actuated to level the sole of a left shoe.

The mechanism illustrated in the drawings for reciprocating the racks 20 and 21 during the operation of the machine is constructed as follows:—A projection 25 (see Fig. 2) from one of the racks 20 is connected by a link 26 to the upper end of a lever 27 fulcrumed at 28. The lower end of the lever 27 is connected by a link 29 to a projection 30 from one of the racks 21 so that reciprocating movements imparted to the racks 21 are communicated to the racks 20. A projection 31 from the other rack 21 is connected by a link 32 with one arm 33 of a bell crank lever journaled in the frame of the machine. The other arm 34 of this lever is connected by a universal joint to a link 35 which is similarly secured at 36 to a lever 37 pivoted at 38 on the frame of the machine (see Fig. 1). The lever 37 is provided with a cam roll 39 engaging a cam 40 secured to the cam shaft 1 of the machine, and this cam through the above described connections imparts reciprocating movements to the racks 20 and 21. As illustrated in the drawings the construction and arrangement of the cam 40 and the connections between the cam and the slides 20 and 21 are such that when the rolls pass on to the toe of the shoe they are in their position of least inclination, as shown in Fig. 6, and are held in this position during the first passage of the rolls over the forepart. The central portion of the forepart of the sole is thus leveled during the first inward movement of the jack. As the rolls pass on to the shank their inclination is slightly increased, and at each succeeding passage over this part of the sole their inclination is further increased so that the shank portion of the sole is leveled progressively from center to edge. As the rolls pass on to the forepart of the sole during the final outward movement of the jack, the inclination of the rolls is decreased so as to properly level the opposite sides of the forepart of the sole, and just before the rolls pass off of the toe of the shoe they are returned to their original position.

The mechanism so far described for actuating the rolls varies the lateral inclination of the rolls during the leveling operation so as to impart a certain shape to the sole. In order that the machine may be adapted for operation upon different styles of work, the mechanism for varying the inclination of the rolls above described is provided with means of adjustment whereby the extent of

inclination imparted to the rolls can be changed. An auxiliary mechanism is also provided for varying the operation of said mechanism at certain points in the leveling operation and also an additional mechanism by which the inside rolls can be actuated independently of the outside rolls. In order to change the amount of the inclinations imparted to the rolls by the mechanism above described, the link 32 is connected with the arm 33 by a pivot 56 which is mounted to slide in a slot in the arm, and is connected by a link 57 with a slide 58. The link 57 is connected to the slide 58 by an adjusting device 59 so that the link can be adjusted with relation to the slide, and thereby the pivot 56 adjusted on the arm 33. This adjustment of the pivot 56 changes the amount of inclination imparted to the rolls by the movement of the arm as will be apparent from an inspection of Fig. 2. The slide 58 remains stationary while the forepart of the sole is being leveled, so that an adjustment of the pivot 56 on the arm 33 serves to adjust the inclination imparted to the rolls while acting on the forepart of the sole.

In order to adjust the inclination imparted to one roll independently of the other roll, so that one side of the sole may be rounded over more or less than the other, the link 29 is adjustably connected with the lever 27 by means of a pin 60 which can be inserted in any one of a series of holes in the lever as is clearly shown in Fig. 2. By means of this adjustment, the movements imparted to the racks 20 from the racks 21 may be increased or diminished, and any desired inclination imparted to the inside rolls independently of the inclinations imparted to the outside rolls.

The auxiliary mechanism for varying the operation of the mechanism for actuating the rolls so far described, comprises the slide 58 hereinbefore referred to, a link 61 connecting the slide 58 with a slotted lever 62, which is connected by segment gears 63 to a lever 64 pivoted at 65 to the frame of the machine, and provided with a cam roll engaging a cam path 66 in the side of the worm gear 52. This auxiliary mechanism acts to move the pivot 56 on the arm 33 at certain times during the leveling operation so that the inclination which would otherwise be imparted to the rolls is increased or diminished. In the construction illustrated, this auxiliary mechanism is arranged to move the pivot 56 when the rolls pass on to the shank portion of the sole, and to return it to its original position when the rolls pass off of the shank. The extent of the inclination imparted to the rolls while acting on the shank is, therefore, controlled by the auxiliary mechanism, and by adjusting this mechanism the inclination imparted to the rolls while acting on the shank can be adjusted independently of the inclination of the rolls while acting on the forepart. In order to provide for an adjustment of the auxiliary mechanism, the link 61 is adjustably connected to the lever 62, as indicated in Fig. 2. The auxiliary mechanism above described is quite similar in construction to the auxiliary mechanism disclosed in applicant's prior patent hereinbefore referred to, to which patent reference may be had for a complete disclosure of the details of construction.

To enable the inside rolls to be actuated independently of the outside rolls, the fulcrum 28 of the lever 27 is carried by one arm of a bell crank lever 67 pivoted at 68 to the frame of the machine. The other arm of the bell crank lever 67 is pivotally connected to the upper end of a link 69, the lower end of which is adjustably connected at 70 to a slotted lever 71 pivoted on the frame of the machine. The lever 71 is geared to a lever 72 provided with a roll 73, which engages a cam 74 on the cam shaft 1. It will be seen that the cam 74 acting through the connections above described will oscillate the bell crank 67 and through the lever 27 and link 26 reciprocate the racks 20 without interfering with the movements of the racks 21, and thereby the inclination of the inner rolls will be changed independently of the outer rolls. In the construction illustrated in the drawings, the cam 74 is so constructed and arranged with relation to the other operating parts of the machine that the inner rolls are actuated when the rolls pass on to and off of the shank, the inclination of the inside rolls while acting on the shank thus being controlled by the cam 74. By adjusting the lower end of the link 69 on the lever 71, the extent of the inclination imparted to the inside rolls while acting on the shank can be adjusted as desired.

The operation of the mechanism for varying the inclination of the rolls during the leveling operation will be readily understood from the description above given. The manner in which the various adjustments are made and the results obtained by these adjustments will also be readily understood. By means of the adjustable connection between the link 29 and the lever 27 it will be seen that the inclination imparted to one of the leveling rolls associated with a jack can be adjusted independently of the other roll. By means of the manual adjustment of the connection between the link 32 and the arm 33 in connection with the adjustment between the link 29 and lever 27, the inclination imparted to either roll can be adjusted independently of the other roll. By means of the auxiliary mechanism acting to automatically adjust the connection between the link 32 and the arm 33 during the leveling

operation, the inclination imparted to the rolls while acting on the shank can be adjusted independently of the inclination imparted to the rolls while acting on the forepart, and by means of the additional mechanism for actuating the inside rolls the inclination of one roll while acting on the shank can be adjusted independently of the inclination imparted to the other roll. By means of these adjustments it will be obvious to those skilled in the art that the machine is adapted for operation upon practically all the various styles of shoes met with in actual practice, and that the rolls can be so actuated as to produce practically any shape of sole required by the trade.

In sole leveling machines of the class to which the present invention relates, it is desirable to impart a vibrating movement to the rolls, and accordingly the machine illustrated in the drawings is provided with means for vibrating the rolls. To accomplish this result the heads 8 are mounted to slide in forks 42 in the forward ends of the roll carrying beds 4 and are actuated by the shafts 13 to which rapid endwise reciprocating movements are imparted by eccentrics 45 secured to a rotating shaft 46, and connected to yokes 44 in which the rear ends of the shafts 13 are journaled. The heads 8 are caused to move with the shafts by the collars 43, and the hubs of the gears 12 which engage opposite sides of the cross pieces 14.

The machine above specifically described embodies the present invention in the best form which has as yet been devised, but it is to be understood that the various features of the invention are not limited thereto, but may be embodied in other forms. Thus while in the machine herein illustrated and described the mechanism for independently varying the inclination of the rolls acts only while the rolls are leveling the shank portion of the sole, this feature of the invention may be embodied in a machine in which the inclination of the rolls is varied independently while acting on other portions of the sole, or during the entire leveling operation, as the applicant is the first in the art to provide any means whereby the inclination of one roll is varied independently of the other during the leveling operation. The other features of invention hereinbefore referred to are also generic in character, and are not limited to any particular construction or arrangement of parts.

The nature and scope of the present invention having been indicated, and a machine embodying the invention in its preferred form having been specifically described what is claimed is:

1. A sole leveling machine, having, in combination, a shoe supporting jack, two sole leveling rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, means for varying the lateral inclination of the rolls during the leveling operation and means for adjusting the inclination imparted to one of said rolls without changing the inclination imparted to the other roll, substantially as described.

2. A sole leveling machine, having, in combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, means for varying the lateral inclination of the rolls during the leveling operation, and means for adjusting the inclination imparted to each roll without changing the inclination imparted to the other roll, substantially as described.

3. A sole leveling machine, having, in combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, means for varying the lateral inclination of the rolls during the leveling operation, and means for adjusting the inclination imparted to the rolls while acting on the shank of the sole without changing the inclination imparted to the rolls while acting on the forepart of the sole, substantially as described.

4. A sole leveling machine, having, in combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, means for varying the lateral inclination of the rolls during the leveling operation, and means for adjusting the inclination imparted to each roll without changing the inclination imparted to the other roll, and for adjusting the inclination imparted to the rolls while acting on the shank of the sole without changing the inclination imparted to the rolls while acting on the forepart of the sole, substantially as described.

5. A sole leveling machine, having in combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, and means for varying the lateral inclination of one roll independently of the other roll during the leveling operation substantially as described.

6. A sole leveling machine, having, in combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, means for varying the lateral inclination of each roll during the leveling operation, acting to vary the inclination imparted to one roll independently of the other roll, and means for adjusting the inclination imparted to each roll, substantially as described.

7. A sole leveling machine, having, in

combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a lasted shoe supported upon the jack, and mechanism acting automatically and independently of the last to vary the relative lateral inclination of the rolls during the leveling operation, substantially as described.

8. A sole leveling machine, having, in combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, and automatic mechanism for varying the lateral inclination of the rolls during the leveling operation, acting to vary the inclination imparted to one roll independently of the other roll, substantially as described.

9. A sole leveling machine, having, in combination, a shoe supporting jack, two rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, and mechanism acting automatically to vary the lateral inclination of the rolls during the leveling operation, and to impart a greater inclination to one roll than to the other, substantially as described.

10. A sole leveling machine, having, in combination, a shoe supporting jack, two sole leveling rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, and connected mechanism acting automatically to change the relative longitudinal position of the jack and rolls, and to vary the relative lateral inclination of the rolls, substantially as described.

11. A sole leveling machine, having, in combination, a shoe supporting jack, two sole leveling rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, and an independent carrier for each roll, said carriers being movable during the leveling operation to vary the inclination of the rolls and thereby vary the operation of the rolls on different portions of the sole, substantially as described.

12. A sole leveling machine, having, in combination, a shoe supporting jack, two sole leveling rolls acting respectively on opposite sides of the bottom of the sole of a shoe supported upon the jack, and separate carriers for the rolls movable with relation to each other during the operation of the machine to impart a greater lateral inclination to one roll than to the other, substantially as described.

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

ERASTUS E. WINKLEY.

Witnesses:

FRED O. FISH,

FARNUM F. DORSEY.

Correction in Letters Patent No. 1,057,908.

It is hereby certified that in Letters Patent No. 1,057,908, granted April 1, 1913, upon the application of Erastus E. Winkley, of Lynn, Massachusetts, for an improvement in "Sole-Leveling Machines," an error appears in the printed specification requiring correction as follows: Page 2, line 39, for the patent "No. 558,548" read *No. 555,548;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of April, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.