(No Model.)

E. C. JUDD.

SOLE LEVELING MACHINE.

No. 530,421. Patented Dec. 4, 1894.

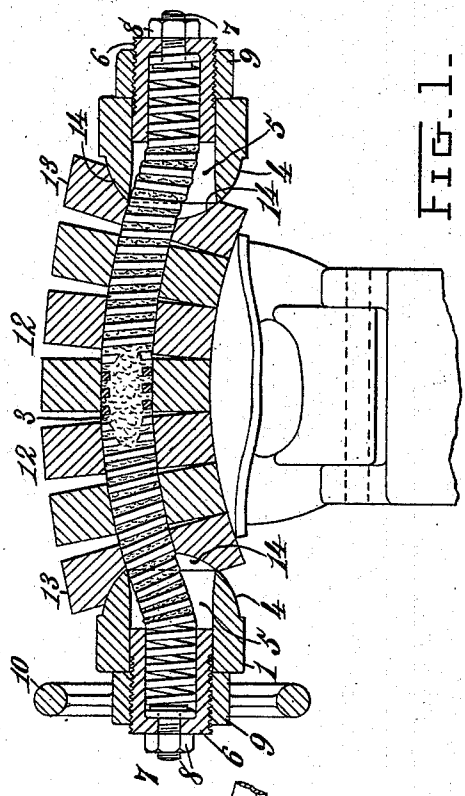

FIG. 1.

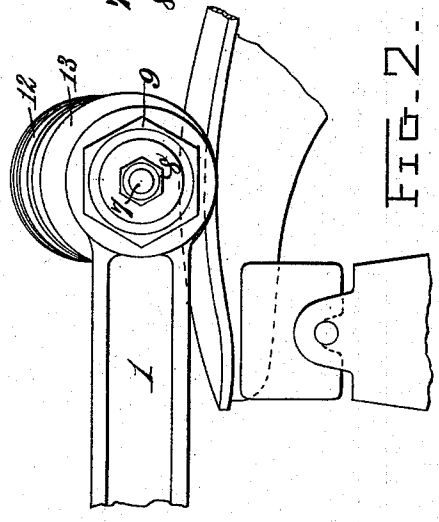

FIG. 2.

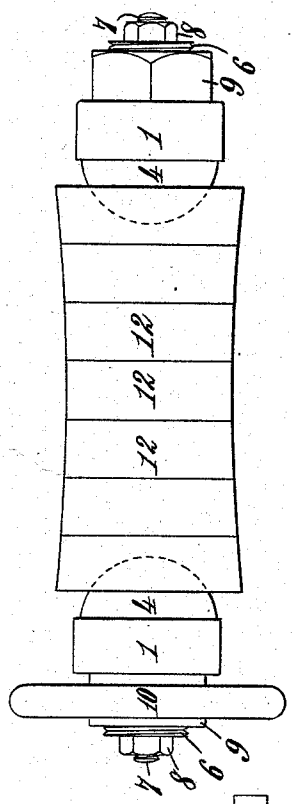

FIG. 3.

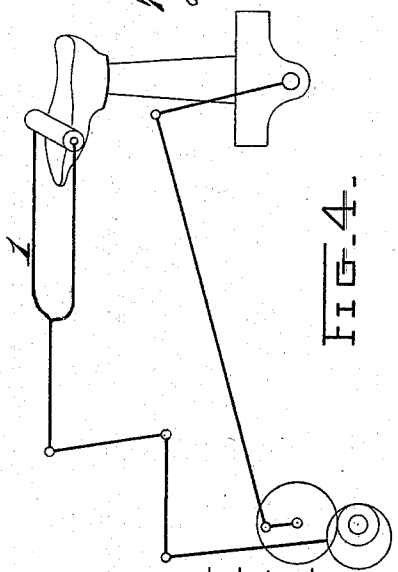

FIG. 4.

WITNESSES:

Geo. W. Rea.

Robert Everett

INVENTOR:

Edward C. Judd.

By James L. Norris.

Atty.

UNITED STATES PATENT OFFICE.

EDWARD C. JUDD, OF BOSTON, MASSACHUSETTS.

SOLE-LEVELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 530,421, dated December 4, 1894.

Application filed August 25, 1894. Serial No. 521,321. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. JUDD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Sole-Leveling Machines, of which the following is a specification.

This invention relates to that type of sole-leveling machines having adjustable rollers for acting on soles, which vary in contour or shape. It has heretofore been proposed to employ two rollers arranged end to end and provided with adjustable bearings for the purpose of rendering the rollers susceptible of adjustment to approximately conform to the surfaces of soles varying in contour or shape, but prior rolls of the character alluded to require manipulation of special adjusting contrivances whenever the position of the rolls requires changing or variation to suit the shape or particular condition required. This is in some respects objectionable, and the chief object of my present invention is to avoid such objection, and to provide a sole-leveling roll which will yield and automatically conform itself to the contour or shape of the sole.

The invention has for its object to provide a sole-leveling roll composed of disks and adapted to extend entirely across the sole and to yield and automatically adjust itself to the surface of the sole without danger of binding or cramping the disks.

The invention also has for its object to provide a sole-leveling roll composed of a plurality of disks of hard material mounted on an axis and adapted to yield and adjust themselves to the sole, while maintaining contact at the edges of their peripheries and preserving a continuity of the acting surface to level and provide the sole with a smooth unbroken surface.

These objects are accomplished in the manner and by the means hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a sole-leveling roll constructed in accordance with my invention, and represented as acting upon the sole of a boot or shoe. Fig. 2, is a detail side elevation showing the roll, a portion of the yoke or frame which carries the roll, a portion of a shoe and a portion of a toe rest for the shoe. Fig. 3, is a front end elevation, showing the roll and devices by which it is carried, and Fig. 4, is a diagrammatical view designed to illustrate the mode of operation of a known sole-leveling machine in connection with which my improved roll may be used.

In order to enable those skilled in the art to make and use my invention I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a yoke, frame or carrier of the character used in well known sole-leveling machines and adapted to be reciprocated in a horizontal plane and also to swing in a vertical plane, so that the sole-leveling roller mounted on the yoke, frame or carrier can be pressed down upon the sole of a boot or shoe and caused to traverse the surface of the sole for the purpose of leveling the same. The boot or shoe is usually placed upon a last mounted on an oscillatory jack, as will be understood by reference to the diagrammatical view Fig. 4. In practice the jack oscillates and the yoke, frame or carrier reciprocates horizontally, by which mode of operation the best results are attained.

The improved sole-leveling roll which constitutes my present invention comprises a flexible axis or shaft 3 adapted to assume varying positions and constructed of a spiral strip of metal possessing the characteristics or properties of a spiral spring. The strip of metal is sufficiently stout or strong to meet the conditions necessary when the leveling roll is clamped or pressed down on the sole of the boot or shoe. The extremities of the arms or members composing the yoke, frame or carrier are each formed on the inner side with a hemispherical projection or bearing 4, through each of which extends a passage 5 adapted to receive a socket piece or holder 6 to which one end of the shaft 3 is secured by means of a bolt 7 and nut 8. A socket piece or holder 6 is arranged in each passage 5 and each socket piece or holder is formed on its exterior with a screw threaded portion to receive a confining nut 9. One of the nuts 9 is preferably formed with a hand wheel or finger portion 10 by which it can be conveniently manipulated for the purpose of adjusting one

of the socket pieces or holders 6 and thus enable the tension of the flexible shaft to be regulated or increased and diminished whenever occasion may demand. In the construction illustrated the socket piece or holder 6 opposite the one on which the hand wheel nut is mounted is rigidly fixed in position, but since the tendency of the spiral metallic strip is to draw or pull the socket pieces or holders 6 in a direction toward one another, both socket pieces or holders can be movably mounted in or on the arms or members of the yoke, frame or carrier.

The body of the roll comprises a plurality of disks 12 and 13, the disks 13 being provided with concavities 14 which accurately fit the convex surfaces of the hemispherical projections or bearings 4, by which means ball and socket connections between the carrier and the roll are provided. The disks are strung upon the flexible shaft 3 and normally lie contiguous at their sides as represented in Fig. 3, in which position the flexible shaft stands in a horizontal plane, or substantially so. The disks are composed of any hard or rigid material suitable for the purpose in hand, but preferably they are composed of brass or any other metal.

The sole-leveling roll is uniformly concave at its periphery, so that in its normal position, Fig. 3, it will conform to the usual curved shape of the sole of a boot or shoe. The concavity of the roll is obtained by constructing the disks of different diameter and arranging them so that they gradually decrease in diameter from the outermost disks to the central one, as will be clearly understood by reference to Fig. 3.

The flexibility or elasticity of the shaft 3 renders it possible for the leveling roll as a whole to yield out of a rectilinear line and assume an arched form or curvature corresponding exactly or approximately to the contour or shape of the sole of the boot or shoe, whereby it is possible to practicably use the roll on boot or shoe soles which greatly vary in shape, particularly the shanks of soles that vary in contour from a slight curve to an approximately V-shape in cross section.

The flexible shaft does not necessarily rotate axially, but, as here shown, the disks of rigid material are designed to rotate on the shaft, and each disk is susceptible of rotating or turning independent of the others. The shaft is cylindrical and sufficiently stiff to render it possible to exert considerable pressure on the sole of the boot or shoe without liability of the shaft collapsing or being too readily bent under pressure. For practical work, in leveling the sole of a boot or shoe, the flexible shaft must be so constructed and combined with the disks of rigid material as to enable the parts to conform to the contour of the sole and exert the requisite pressure. In operation the disks roll over the sole and turn or rotate on the flexible shaft. I prefer to construct the disks of varying diameter, but do not, in all cases, limit myself thereto.

The roll may be caused to operate upon or traverse the surface of the entire sole, or it may be caused to operate on the shank alone or on the fore part of the sole only.

The provision of sole-leveling roll constructed as described, or possessing the characteristic features set forth, entirely avoids the necessity of manipulating set screws, or other adjusting devices, each time the position of sole-leveling rolls is to be changed, or varied, to accommodate them to the particular shape of sole which is to be operated upon.

In my invention a single roll is adapted to extend entirely across the boot or shoe sole and since this roll readily yields and conforms itself to the contour or shape of the sole the latter is leveled and provided with a smooth surface throughout its width.

In the operation of the improved roll, when it is sprung into an arched or curved form as shown in Fig. 1, the edges of the peripheries of the disks lie contiguous, or in contact, and preserve a continuity of the bearing surface acting on the sole, whereby I entirely avoid the formation of lines, or ridges, longitudinally of the sole, as will occur with those sole-leveling rolls arranged end to end with a space between the adjacent ends.

In all existing sole-leveling machines of which I am aware, the rolls either extend entirely across the sole, or are arranged to overlap one another, or are arranged in line with one another. In no instance, so far as known to me, has a sole-leveling roll been before employed, having a flexible or yielding shaft or axle and adapted to automatically assume different curvatures for the purpose of conforming itself to the contour or shape of the sole. It has been proposed to use spring bearings for sole-leveling rolls, but in such construction the roll itself is not inherently elastic and cannot assume different curvatures to meet the conditions required in operating on soles that vary more or less in contour or shape.

In the construction illustrated in the drawings the flexible, or elastic, shaft can be shortened or lengthened by the adjustment of one, or both, of the socket holders or pieces 6, and consequently the tension or power of the shaft is diminished or increased for the purpose of obtaining a more or less rigid action in the practical operation of the roll.

The spiral metalic strip composing the flexible axle or shaft may be provided with a filling of rubber, or any other elastic, or suitable, composition, or material, as represented in Fig. 1.

I prefer to employ a flexible, or elastic, axle, or shaft, composed of a spiral metallic strip and possessing the characteristics of a spiral spring, but I wish it clearly understood that the specific construction of the axle or shaft,

or the material of which it is composed, may be varied without affecting the spirit of my invention.

The roller described and shown may be used on the roller-carrying head of any existing or other sole-leveling machine, and it may be arranged and operated to act along the entire sole, or only along a portion thereof.

The body of the roller is preferably composed of a plurality of disks, but I do not confine myself thereto, as the roller body may be otherwise constructed and mounted on the flexible or elastic shaft.

Having described my invention, what I claim is—

1. A sole-leveling roll, consisting of a flexible axle or shaft and a plurality of rigid disks of varying diameter strung thereupon, said disks being arranged so that they decrease in diameter from the outermost disks to the central one, and said roll being adapted to yield and assume different curvatures longitudinally, substantially as and for the purposes described.

2. The combination with the carrier of a sole-leveling machine, of a sole-leveling-roll consisting of a flexible shaft mounted at its extremities in the carrier, and a plurality of disks rotatable on the said shaft, substantially as and for the purposes described.

3. The combination with the carrier of a sole-leveling machine, of a sole-leveling roll consisting of a flexible shaft mounted at its extremities in the carrier, and a plurality of disks of rigid material independently rotatable on the said shaft, substantially as and for the purposes described.

4. The combination with the reciprocating carrier of a sole-leveling machine, of a sole-leveling roll composed of a flexible shaft carrying a plurality of disks and mounted at its extremities in the reciprocating carrier, adjustable socket pieces or holders arranged in the carrier and engaging the ends of the shaft, and nuts for adjusting the socket pieces, substantially as and for the purposes described.

5. The combination with a reciprocating carrier, and a sole-leveling roll provided with a flexible axle or shaft and susceptible of assuming different curvatures longitudinally, of ball and socket connections between the roll and the carrier, substantially as and for the purposes described.

6. The combination with a roll-carrier, of a sole-leveling roll having a flexible axle or shaft susceptible of being lengthened or shortened, and devices connecting the ends of the axle or shaft with the carrier and adapted to lengthen or shorten said axle or shaft, substantially as described.

7. The combination with a roll-carrier, of a sole-leveling roll having an elastic axle or shaft and adapted to assume different curvatures, and tension adjusting socket pieces or holders connecting the axle or shaft with the carrier and serving to change or vary the tension of said axle or shaft, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

EDWARD C. JUDD. [L. S.]

Witnesses:
HARRY EDGAR CILLEY,
FRED W. MCARDLE.