

No. 663,072.

Patented Dec. 4, 1900.

F. W. COY.

SOLE LEVELING MACHINE.

(Application filed Aug. 21, 1899.)

(No Model.)

Fig. 1.

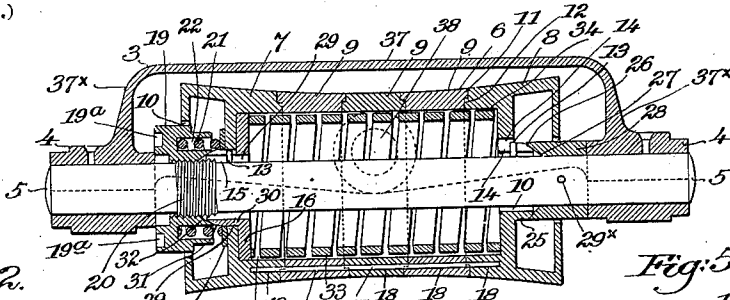


Fig. 2.

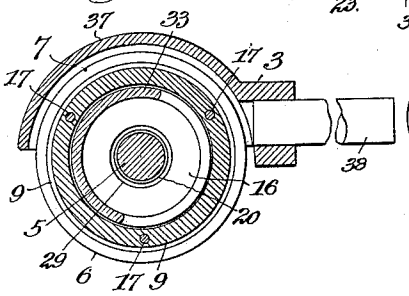


Fig. 5.

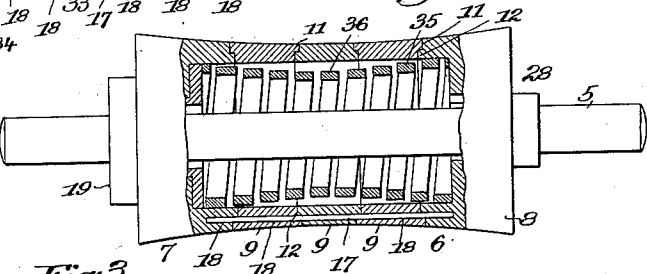


Fig. 3.

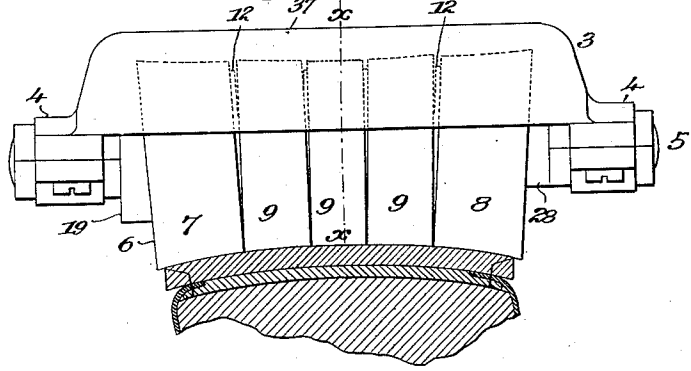
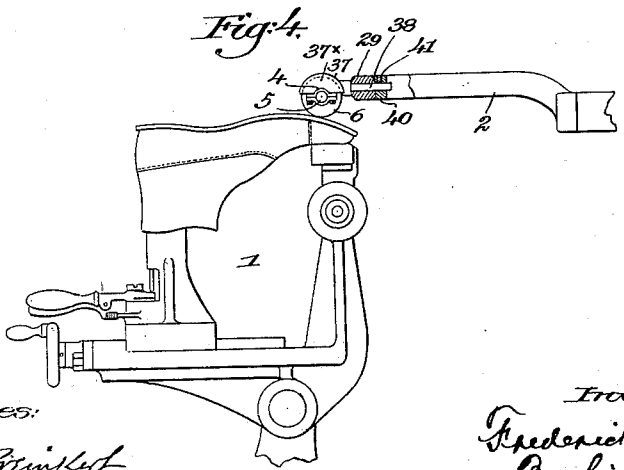


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

FREDERICK W. COY, OF BOSTON, MASSACHUSETTS.

SOLE-LEVELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 663,072, dated December 4, 1900.

Application filed August 21, 1899. Serial No. 727,907. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. COY, 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 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 type embodying a roll which is caused to traverse the sole of a shoe supported on a jack longitudinally from toe to heel and exert a compressive rolling action on the sole to press and roll said sole to cause it to conform to the bottom of the last. As is well known to those skilled in this art, the tread-surface of a shoe-sole presents a curved contour both laterally and longitudinally, and the lateral curvature varies at different points along the sole, it being generally more curved or convex at the shank than along the fore part.

It is essential in beating out or leveling soles of boots and shoes that all parts of this varying curved contour be subjected to the rolling action of the leveling-roll.

It is one object of the present invention, therefore, to produce a roll for sole-leveling machines so constructed and arranged that it will accurately conform to all parts of the bottom of the shoe as it is caused to move over the same, whether the curvature thereof be more or less.

Another object of the present invention is to produce a sole-leveling roll formed of sections yieldingly mounted on a shaft, so that the sections may yield relatively to the shaft and conform to the surface of the sole and yet provide for the free and unrestricted turning of said roll in performing its rolling and compressive functions.

The present invention therefore consists of the devices and combinations of devices, which will be hereinafter described and claimed.

The present invention is illustrated in the accompanying drawings, in which—

Figure 1 shows a longitudinal sectional view taken through the roll and its carrier,

showing the interior construction of such roll. Fig. 2 shows a cross-section through the roll and its carrier, taken on the line X X, Fig. 3. Fig. 3 shows a front elevation of the roll and its carrier and a portion of a shoe shown in section, illustrating the action of the roll during the sole-leveling operation. Fig. 4 is a diagrammatic view showing portions of the jack and roll of a sole-leveling machine and illustrating the connection of the roll-carrier with its reciprocating holder. Fig. 5 shows a modification of the roll shown in Fig. 1, portions being in section to illustrate the underlying construction.

Similar reference characters will be employed throughout the specification and drawings to designate corresponding parts.

In the drawings, 1 indicates a jack of a sole-leveling machine, and 2 the reciprocating roll-holder, which parts may be of any usual or preferred form and arrangement and actuated to impart relative longitudinal movements to the leveling-roll and jack. The roll-carrier 3 is provided at opposite ends with bearings 4, in which is mounted to turn freely a shaft 5, which supports the leveling-roll 6. The leveling-roll 6 consists of a plurality of sections 7, 8, and 9. The sections 7 and 8 are provided with closed ends and with suitable bearings or openings 10, by means of which they are placed over or on the shaft 5, and the sections 9 are formed as rings, the several sections being preferably so constructed that when placed in position as shown in Figs. 1 and 2 the exterior or rolling surface of the roll will be substantially concave, as clearly illustrated in the drawings. The sections 7, 8, and 9 are preferably provided on their meeting or adjacent faces with complementary grooves and flanges 11 and 12, which assist in maintaining the sections in proper relation to each other while in operation.

The shaft 5, as hereinbefore stated, is arranged to turn freely in the bearings 4 of the carrier 3, and the roll 6 is fitted to turn with the shaft 5, preferably by means of pins or splines 13, arranged to engage with a notch 14, formed in the section 8, and in a notch 15, formed in a collar or disk 16, fitted in the section 7, the arrangement being such that when the sections are assembled and mounted on the shaft, as shown in Figs. 1 and 3, the fric-

tional contact of the roll on the bottom of the shoe-sole will cause such roll to turn, the shaft 5 turning freely in its bearings 4. The sections of the roll are arranged to yield or move 5 relatively to the shaft 5 as the roll is moved along over the shoe-sole, and this yielding takes place against the tension of an elastic connection or cushion, which may consist of flexible rods 17, inserted in bearings 18, passing 10 through the intermediate sections 9 and into the inner faces of the sections 7 and 8, the arrangement being such that as the roll is moved along over the shoe-sole the compressive force exerted thereon will have a 15 tendency to cause the sections of the roll to rock or move relatively to each other and to the shaft 5, as indicated in Fig. 3 of the drawings, against the elastic force exerted by the rods 17, and thus conform to the surface of 20 the sole. The sections are assembled on the shaft 5, as shown in Fig. 1, and may be secured thereon in any suitable way which will provide for the elastic yielding or moving of the sections, and this is secured in the invention of the drawings by providing a threaded 25 nut 19, which engages a threaded portion 20 of the shaft 5, and such nut is arranged to exert a yielding pressure against the section 7, forcing the sections 7, 8, and 9 in close contact with each other by means of a spring 21, seated in a bearing 22 of the nut 19 and engaging a washer 23, received in a recess 24, 30 formed in the section 7, the spring 21 exerting a yielding pressure against the section 7 and holding the sections of the roll in elastic contact with each other.

In order that the sections 7 and 8 may freely rock on the shaft 5, the section 8 may be provided with a tubular boss 25, which has a 40 curved or rounded end 26, fitting a curved or rounded bearing 27 in a collar 28, fixedly secured by means of a pin 29^x to the shaft 5, the apertures 10 in such section being larger than the shaft 5 and larger than the collar 28, 45 so that the section may freely rock thereon. The section 7 likewise has an enlarged aperture 10, through which the nut 19 is inserted, and the disk 16 has an enlarged aperture 29 and also a lateral projected boss or collar 30, 50 having a rounded bearing-surface 31, which is engaged by a corresponding bearing 32, carried by the nut 19. It will be noted that by the construction just described the engagement of the sections of the roll with each other 55 is controlled by the pressure exerted by the nut 19 against the section 7, and by turning the nut 19 on the shaft 5 by means of a pin-wrench inserted in the holes 19^a the force of the spring 21 may be increased or diminished, 60 and, furthermore, if it be desired to render the roll rigid and unyielding the nut 19 may be turned so far along the shaft 5 toward the section 7 as to cause its inner end to engage the washer 23 and tightly clamp the sections 65 of the roll together.

While the roll described is complete and operative in use for most purposes, it is pre-

ferred in order to further cushion the movements of the sections to employ a spring cushioning device consisting of a coiled spring 33, 70 which is placed within the roll and is preferably of such a size as to engage the interior diameters of the sections, which spring is received at either end in seats or bearings 34, 75 formed in the sections 7 and 8, and when this construction is employed it will be necessary to use only one flexible rod 17, which in such case would not be depended upon to exert any spring force on the rolls, but merely for the purpose of preventing any turning of the 80 sections of the roll relatively to each other.

In Fig. 5 a modification of the device is shown in which the spring 35, forming the interior cushion, is tapered at its central portion 36, so as not to contact with the sections 85 at such point, as along the central portion there is not so much rigidity required as at the end portions; but, as heretofore stated, the preferred form of the device is illustrated in Fig. 1 of the drawings. In order to prevent the admission of dust or dirt between 90 the sections of the roll during the operation thereof, the roll-carrier 3 is provided with an inclosing hood 37, which extends over the roll from side to side and preferably incloses 95 about one-half of the diameter of such roll, as clearly shown in Figs. 3 and 4 of the drawings, and such hood may conveniently extend down along each end of the roll, as shown at 37^x, which ends will support the bearings 4. 100

The carrier 3 is preferably mounted in its holder 2, so as to rock in such holder, and this may conveniently be secured by providing the carrier with a shank or spindle 38, fitted in a bearing 39 at the forward end of 105 the holder 2 and held in the bearing so as to rock therein in any suitable or convenient manner, as by means of a collar 40, secured to the shank 38 by means of a set-screw 41. (See Fig. 4.) 110

It has been heretofore proposed to produce a sole-leveling roll formed of sections mounted to turn on a shaft, which shaft was made of a flexible spring which was capable of bending 115 in order to permit the roll to conform to the curvature of the shoe-sole; but in such construction the sections forming the roll were mounted to turn independently of each other on the flexible shaft. By reason, however, of the constant bending of the flexible 120 shaft by the sections of the roll during the leveling operation it was found that the roll would not freely revolve, and in other respects the device was found generally unsatisfactory in operation. Again, in the device 125 above referred to where the sections of the roll turn on the shaft it was found necessary to pack the shaft with some lubricant in order to facilitate the turning of the sections, which lubricant would get between the sections 130 of the roll and prevent the close contact of such sections where they act on the sole, resulting in a poor operation of the roll and the staining and soiling of the shoe-sole by

the lubricant. In the present device, however, the roll and the rigid shaft upon which it is mounted turn freely together in the roll-carrier, the sections of the roll being held to
 5 turn together, and the sections are freely movable to cause the portion of the roll which is in contact with the shoe-sole to accurately conform to the curvature thereof, and the bearings of the roll-shaft may be lubricated
 10 to secure a free turning of the roll without the liability of the continuity of its rolling-surface being broken or the lubricant staining the shoe-sole.

The operation of my improved roll has been
 15 sufficiently set forth in connection with the foregoing description of its construction and arrangement, and any further description is deemed unnecessary.

Having described the construction and
 20 mode of operation of the present invention, I claim as new and desire to protect by Letters Patent of the United States—

1. The combination with a roll-carrier, of
 25 a rigid shaft supported in said carrier, a leveling-roll formed of a plurality of sections carried by said shaft, and spring-rods connecting the sections of the leveling-roll, substantially as described.

2. The combination with a roll-carrier, of
 30 a rigid shaft supported in said carrier, a leveling-roll formed of a plurality of sections

carried by said shaft and means for yieldingly forcing the sections of the roll together, substantially as described.

3. The combination with a roll-carrier, of
 35 a rigid shaft supported in said carrier, a sole-leveling roll carried by said shaft formed of a plurality of sections, and means whereby said sections may be permitted to conform to the varying contour of the bottom of the sole,
 40 or rigidly clamped together as desired, substantially as described.

4. The combination with a roll-carrier, of
 45 a rigid shaft supported in said carrier, a sole-leveling roll carried by said shaft formed of a plurality of sections, an elastic cushion supporting the sections of the roll, and means to connect the sections of the roll together, substantially as described.

5. The combination with a roll-carrier, of
 50 a rigid shaft supported in said carrier, a sole-leveling roll carried by said shaft formed of a plurality of yielding sections, and means to regulate the extent of the yielding movement of said sections, substantially as described.
 55

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

FREDERICK W. COY.

Witnesses:

T. HART ANDERSON,
 HORACE VAN EVEREN.