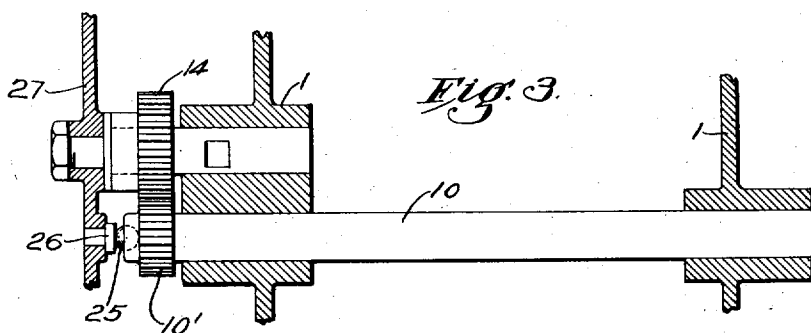
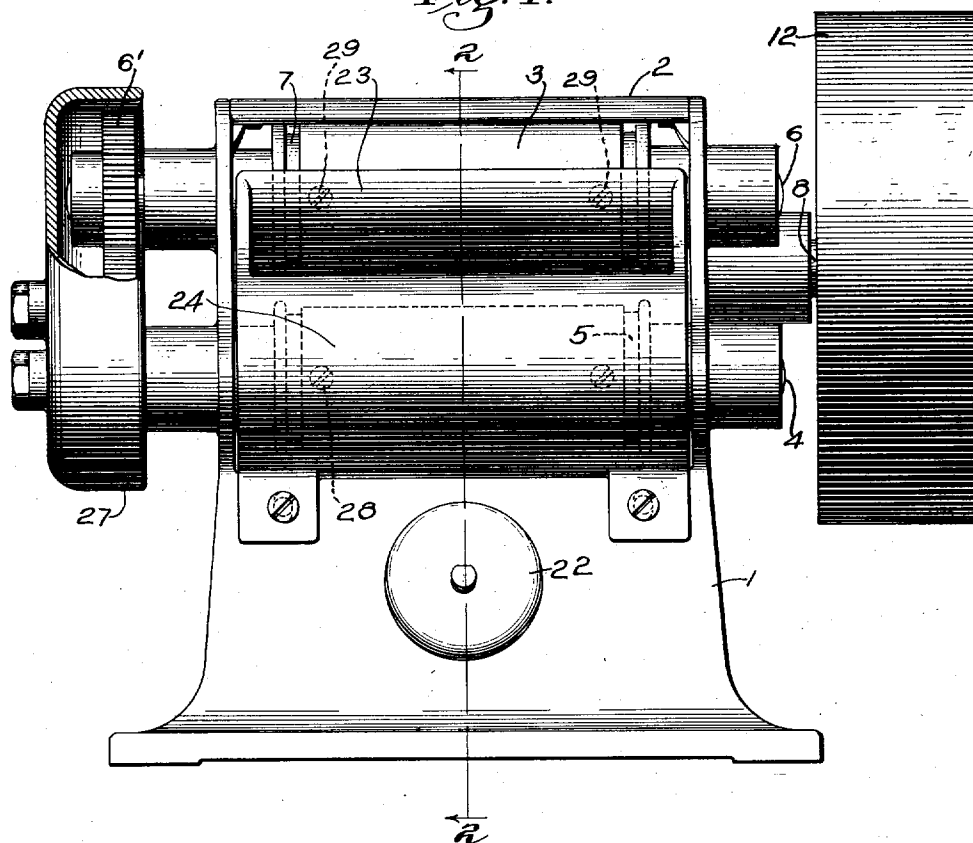


1,007,870.

Fig. I.

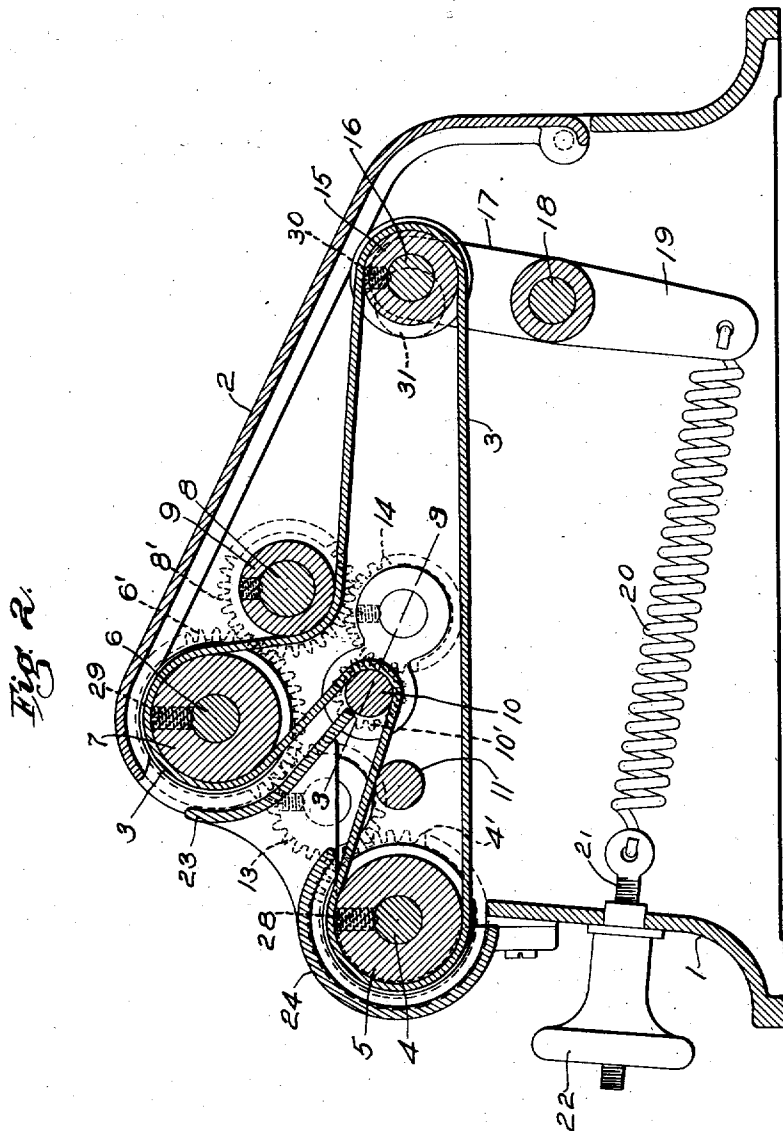


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F. E. HOOPER.
SOLE FLEXING MACHINE.
APPLICATION FILED FEB. 21, 1911.

1,007,870.

Patented Nov. 7, 1911.
2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FREDERICK E. HOOPER, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOLE-FLEXING MACHINE.

1,007,870.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed February 21, 1911. Serial No. 609,885.

To all whom it may concern:

Be it known that I, FREDERICK E. HOOPER, a citizen of the United States, residing at Swampscott, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sole-Flexing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for operating upon the soles of boots and shoes and more particularly to machines for bending or flexing shoe soles to make them pliable and thus give the shoe to which they are applied greater flexibility when used and added ease and comfort to the wearer.

The object of the present invention is to improve the construction of machines of the character described and increase their efficiency with simplicity of parts and cheapness of manufacture.

The features of the invention relate to certain devices, combinations and arrangements of parts hereinafter described and particularly pointed out in the appended claims possessing advantages in simplicity of construction and ease of operation which will be apparent to those skilled in the art.

The preferred embodiment of the invention is illustrated in the accompanying drawings in which—

Figure 1 is a front elevation of the machine; Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1; and Fig. 3 is a detail, in section, on the line 3—3 of Fig. 2.

In the embodiment of the invention illustrated in the drawings the operative parts of the machine are mounted in a suitable frame or casing 1 which substantially incloses all of these parts keeping them clean and thus preventing the soles in passing through the machine from becoming soiled or stained. The casing 1 is provided with a hinged cover 2 which may be thrown back when it is desired to get at the operative parts within the casing. The sides of the casing 1 are provided with bearings for the ends of a series of shafts which support a series of rolls about which an endless belt 3 is passed.

At the extreme front of the casing 1 are bearings for a shaft 4 which supports the

flanged front roll 5 between the bearings. Toward the top of the casing bearings are provided for a shaft 6 which supports the upper roll 7 similar to the roll 5. Both of these rolls engage the inside of the belt 3. At the rear of the roll 7 are bearings for the driving shaft 8 which supports a roll 9 engaging the outside of the belt 3. This roll 9 is so arranged that the belt wraps nearly around the roll 7 and also wraps partially around the roll 9 thus increasing the driving friction applied to the belt. Beneath the upper roll 7 are bearings for a sole flexing roll 10. Between the front roll and sole flexing roll 10, there is mounted an idle roll 11 which acts to support the belt 3 as it passes between these two rolls.

The driving shaft 8 has mounted at one end a driving pulley 12 (Fig. 1) and at its other end is provided with a gear 8' which meshes with a gear 6' secured to one end of the shaft 6, which in turn, through an idle gear 13, meshes with and drives a gear 4' secured to one end of the shaft 4. The flexing roll 10 is also provided at one end with a gear 10' which is driven from the gear 8' by means of an idle gear 14 in mesh with these two gears. The rolls 5, 7 and 9 are secured to their respective shafts for rotation therewith, in a manner presently to be described, so that by means of the described gearing each of the four rolls just described are positively driven.

During the continued use of the machine the endless belt, which preferably is made of leather, has a tendency to stretch and therefore, a take-up roll is provided for taking up the elongation of the belt and thus keeping it always tightly stretched over the flexing and driving rolls. The roll 15 is freely rotatable upon a stud 16 pinned in bearings at the upper ends of the two arms of a yoke 17 pivoted upon a stud 18 mounted at the rear of the casing. The yoke is provided with a depending arm 19 which is connected by a coiled spring 20 with a threaded eye-bolt 21 provided with a nut 22. The bolt passes through the front of the casing so that the nut is located where it is conveniently accessible to the operator and may be adjusted to secure the proper tension on the belt, or may be manipulated by the operator to vary the tension while he remains in position to feed soles to the machine.

The soles to be operated upon are fed into the machine between the lower side of the flexing roll 10 and the endless belt and after having been drawn around this roll emerge from its upper side.

It has been found in practice that machines, which heretofore have been adapted to this work, such as that shown in the United States patent to Ziegler No. 593,827, have been slow in operation. This has been for the reason that no means was provided in those machines for directing the sole as it emerges from the machine away from the point at which the new sole is fed into the machine. In the present invention a work guide 23 is provided formed, preferably, as a part of a front casing 24 which incloses the front roll 5 and is suitably secured to the main casing 1 below this roll (see Fig. 1). This work guide is so shaped that it directs the sole upwardly after it leaves the upper side of the flexing roll 10 and bends it slightly, in a reverse direction to the bend given by the flexing roll, about the upper roll 7 although not sufficiently to break the fibers or injure the sole in any way. With this construction of work guide, the space below it is left entirely free for feeding in new soles for the reason that the two ends of the soles are prevented from overlapping each other while the sole is being flexed by the flexing roll 10. It is not necessary, therefore, as it was in the earlier machines, to wait until one sole has substantially passed through the machine before feeding in another sole. The advantage to be gained in speed will be readily recognized by those skilled in the art.

It becomes necessary at times to renew the endless belt 3 on account of wear and a feature of the present invention consists in such a mounting of the rolls that they can be removed in a simple manner from engagement with the belt when it is found desirable to remove it. To this end the flexing roll 10 is provided at its end which carries the gear 10' with a bearing comprising a ball 25 (Fig. 3) borne upon by a wear plate 26 conveniently mounted in the gear casing 27 which is suitably secured in position over the described train of gears. To the same end the rolls 5 and 7 are secured to their respective shafts 4 and 6 by means of radially extending set screws 28 and 29 (Figs. 1 and 2). To remove the belt it is, therefore, merely necessary to take off the gear casing 27, slip the flexing roll 10 endwise through its bearings which will loosen the tension of the belt, then loosen the set screws 28 and 29 and slip the shafts 4 and 6 endwise from their bearings. Then, on removing the casing 24 and throwing back the hinged cover 2, the rolls 5 and 7 may be removed from the casing 1 leaving the belt held within the casing only by the take-up roll 15. This

roll is readily removed by loosening the set-screw 30 which holds the stud 16 in the arms of the yoke 17 and then adjusting the yoke until the stud is in a position where it can be slipped endwise through a hole 31 formed in the casing 1 for this purpose. After the stud 16 has been removed, the roll 15 may be taken out of the casing and the belt is entirely free of the rolls.

In operating the machine, after a proper tension has been placed upon the endless belt, the soles are fed into the machine through the opening above the casing 24 and below the work guide 23 until they are seized between the flexing roll 10 and the portion of the belt at the lower side of that roll. This roll is of relatively small diameter, about three quarters of an inch in practice, and in passing around it the sole is given a sharp bend before it is delivered from the machine at the upper side of the guide plate 23. In the continued operation of the machine soles may be fed beneath the flexing roll with one hand and removed as they emerge from the machine with the other hand, making the operation practically continuous.

The nature and scope of the present invention having been indicated and the preferred embodiment of the invention having been specifically described, what is claimed as new, is:—

1. A sole flexing machine, having, in combination, an endless belt, two rolls engaging the inside of the belt at the front of the machine, a flexing roll engaging the outside of the belt intermediate said rolls, a driving shaft having a roll also engaging the outside of the belt, a train of gearing from the driving shaft to positively drive all of said rolls, and a yielding supported take-up roll engaging the inside of the belt at the rear of the machine, substantially as described.

2. A sole flexing machine, having, in combination, an endless belt, a flexing roll and driving rolls at the front of the machine about which the belt passes, a take-up roll at the rear of the machine, a yoke in the arms of which said roll is mounted, an arm depending from said yoke, a spring connected to the arm, and means at the front of the machine where it is conveniently accessible to the operator for adjusting the tension of the spring, substantially as described.

3. A sole flexing machine, having, in combination, an endless belt, a series of rolls at the front of the machine about which said belt passes, a take-up roll at the rear of the machine, a stud on which said take-up roll freely rotates, and a casing for said parts having an opening in its side through which said stud can be removed endwise to free the belt of the take-up roll, substantially as described.

4. A sole flexing machine, having, in combination, an endless belt, rolls about which

said belt passes including a flexing roll, gearing for driving said flexing roll, and a removable plate bearing against one end of the roll to hold it in position but permitting
 5 immediate endwise removal of the roll when the plate is removed, substantially as described.

5. A sole flexing machine, having, in combination, a casing, an endless belt within the
 10 casing, a plurality of shafts having bearings in the walls of said casing, a roll mounted on each shaft between its bearings and engaging the inside of the belt, and radially extending set screws threaded through the sur-
 15 faces of the rolls to hold them in engagement with their shafts whereby endwise movement of the rolls is normally prevented but an immediate endwise removal of the shafts

from within the rolls is permitted on loosening the set screws, substantially as described. 20

6. A sole flexing machine, having, in combination, an endless belt, a front roll, an upper roll and a flexing roll about which
 25 said belt passes, and a work guide extending outwardly from the flexing roll between the front and upper rolls and curved rearwardly at its outer end about the upper roll to direct the sole as it emerges from one side of the flexing roll away from the new sole
 30 being fed to the opposite side of the flexing roll, substantially as described.

FREDERICK E. HOOPER.

Witnesses:

CHESTER E. ROGERS,
 LAURA M. GOODRIDGE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

Correction in Letters Patent No. 1,007,870.

It is hereby certified that in Letters Patent No. 1,007,870, granted November 7, 1911, upon the application of Frederick E. Hooper, of Swampscott, Massachusetts, for an improvement in "Sole-Flexing Machines," an error appears in the printed specification requiring correction as follows: Page 2, line 99, for the word "bolt" read *belt*; 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 5th day of December, A. D., 1911.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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