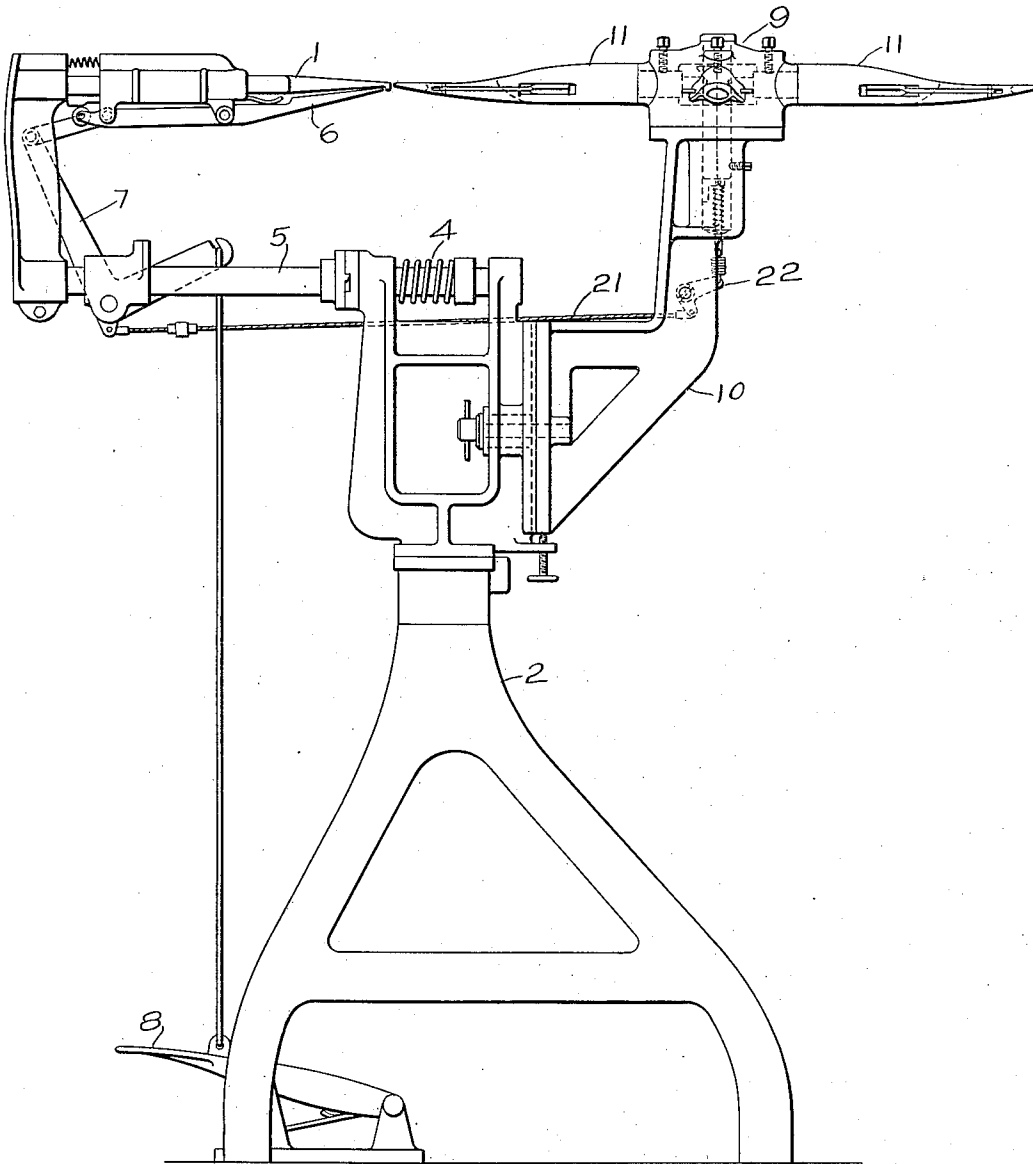


1,058,164.

2 SHEETS—SHEET 1.

Fig. 1.



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FOREPART TURNING MACHINE.
APPLICATION FILED JUNE 16, 1910.

1,058,164.

Patented Apr. 8, 1913.

2 SHEETS—SHEET 2.

Fig. 2.

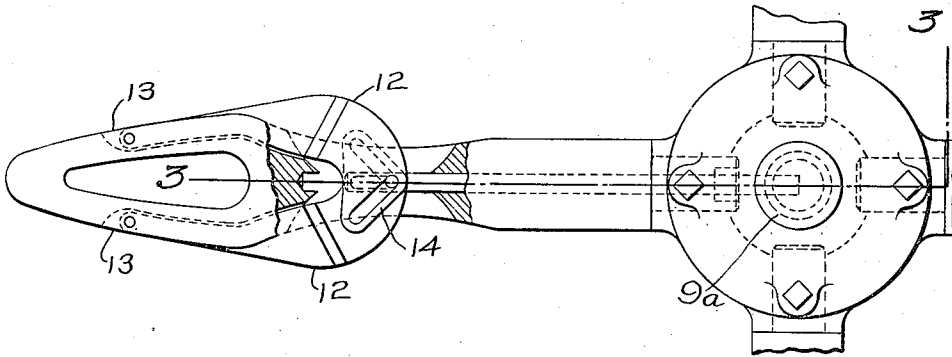


Fig. 3.

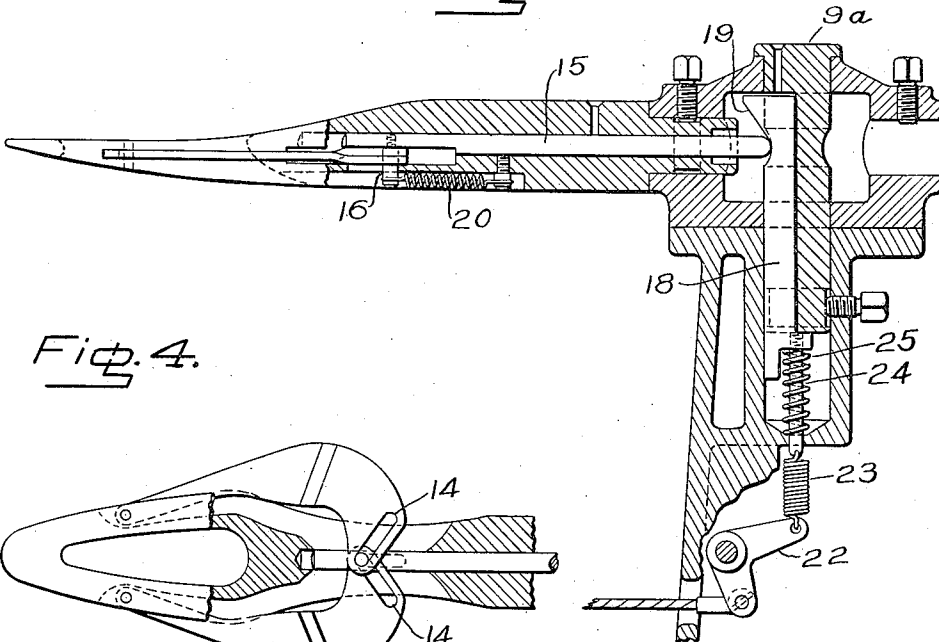
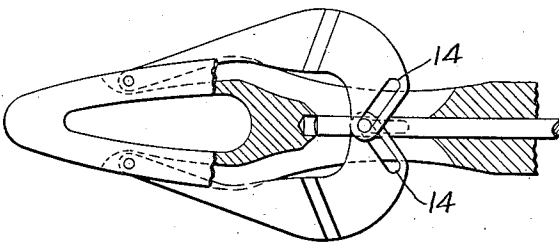


Fig. 4.



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UNITED STATES PATENT OFFICE.

ANDREW EPPLER, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

FOREPART-TURNING MACHINE.

1,058,164.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed June 16, 1910. Serial No. 567,166.

To all whom it may concern:

Be it known that I, ANDREW EPPLER, a 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 Forepart-Turning 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 shoe turning machines and more particularly to the forms used in connection with machines for turning the forepart of the shoe. Turned shoes are sewed wrong side out and after the upper has thus been secured to the sole are turned right side out. Machines which perform, or assist in performing this operation are called shoe turning machines.

The present invention is illustrated in connection with a shoe turning machine of the type described in United States Letters Patent No. 706,038, August 5, 1902, granted to United Shoe Machinery Company on an application filed by the present inventor. In this type of machine the shoe, after the heel part has been turned, is placed over a form which projects into the interior of the forepart of the upper and holds the shoe in position to be operated upon. A turning iron is provided which presses against the toe of the shoe and holds it in place during the turning operation. An auxiliary iron is also provided, movable relatively to the turning iron and preliminarily advanced to engage the sole and give it a preliminary bend or break. This substantially relieves the strain on the upper during the turning operation and makes the operation of the machine approximate more closely to hand methods. The forepart of the upper is turned from the shank toward the toe and considerable difficulty has been experienced by operators in turning the upper at the point where the shank abruptly broadens out to form the ball portion of the shoe. The upper frequently catches or binds when this point is reached and it is necessary to manipulate the upper and exert a considerable amount of force to pull it past this point and turn it successfully without injury. This is naturally troublesome and slow in addition to putting an undesirable strain upon the upper of the shoe.

The object of this invention is to enable the forepart to be turned easily from the shank to the toe without any tendency to bind or catch, causing undue strain on the upper, during the turning operation.

With the above object in view, one feature of the invention contemplates the provision of a shoe form having a continuous taper from the shank to the toe of the shoe.

A further feature of the invention comprises a collapsible form over which the shoe may be easily placed.

An additional feature of the invention contemplates mechanism for expanding the form when the shoe is in position, as will be hereinafter more specifically described.

In the accompanying drawings illustrating the preferred form of the invention, Figure 1 represents an elevation of a shoe turning machine with the improved form attached thereto; Fig. 2 is a plan view of one of the shoe forms attached to the supporting turret and shown in its contracted position; Fig. 3 is a sectional elevation of one of the shoe forms and the operating mechanism therefor; and Fig. 4 is a sectional detail of the form showing it in the expanded position.

In the illustrated embodiment of the invention, the shoe turning machine is shown as provided with a turning iron 1 which is mounted for oscillation in the frame 2 of the machine and is normally retained in working position to clamp the shoe to its form, by a coiled spring 4 surrounding and attached at one end to the supporting rock-shaft 5. An auxiliary turning iron 6 is mounted below the turning iron 1 and is arranged to be operated through its connection with a bell crank 7 and treadle 8. This auxiliary turning iron moves forward and engages the sole of the shoe preliminarily to the turning operation and forms in the shoe what may be termed a preliminary break or bend. The supporting turret 9 is mounted upon a bracket 10 which is capable of vertical adjustment upon the frame of the machine. A plurality of shoe forms indicated at 11 of varying size project radially from the turret which is journaled upon the vertical stud 9^a fixed to the bracket 10, the turret being rotated to present any selected shoe form in position in front of the turning iron 1. The construction thus far described is substantially identical

tical with that shown and described in the Letters Patent hereinbefore referred to and forms no part of the present invention. The machine of that patent is conveniently
 5 utilized as one in which the improved form may be used but it is to be understood, however, that the improvement is capable of general application and its use is not necessarily limited to machines of this particular type.

10 The improved shoe form described herein is intended to support the forepart of the shoe on the inside and to present a continuously inclined taper extending from a point
 15 about midway of the shank, at which point the turning operation is commenced, to the toe of the shoe. The collapsible form of the present invention is preferably shown in connection with the skeleton support 11, illustrated in United States Letters Patent,
 20 No. 973,182, dated October 18, 1910, granted to United Shoe Machinery Company on an application filed by the present inventor. The support 11 is provided with two laterally
 25 movable spreading fingers 12 which are pivotally mounted at their forward ends in recesses 13 formed in the sides of the support. The fingers 12 are each provided with a diagonal slot 14 at their rear end, overlapping
 30 each other, for attachment to the operating mechanism. The means for operating the fingers and extending them laterally comprises a rod 15 slidingly mounted in the support 11 and provided upon its outer end
 35 with a stud 16 which engages within both the diagonal slots 14 where they cross each other. Upon an outward movement of the rod 15 the fingers 12 will be extended laterally due to the forward movement of the
 40 stud 16 which causes an outward pressure to be exerted upon the sides of the diagonal slots in which it travels. The forward movement of the rod 15 is effected by a downward movement of the sliding plate
 45 18 which is provided with a wedge shaped surface, or cam, 19 at its upper end engaging with the inner end of the rod. The rod is held in engagement with its operating
 50 cam 19 and is returned to normal position by a coiled tension spring 20 which is fastened at one end to the support and at the other end to the stud 16.

It is desirable that the fingers 12 shall be contracted while the shoe is being placed
 55 over the form and that as the treadle 8 is depressed to advance the auxiliary turning iron 6, preparatory to the turning operation, the fingers shall be extended to spread the shank portion of the upper outwardly. In
 60 order to obtain this result, the cam 19 is operated directly from the bell crank 7 which actuates the auxiliary turning iron 6. A flexible connection 21 is fastened to the bell crank 7 at one end and at its other end
 65 to one arm of a bell crank 22 pivotally

mounted upon the frame. The other arm of the bell crank 22 engages a coiled spring 23 which connects the bell crank with a rod 24 threaded into the lower end of the plate 18. The spring 23 is of such strength that
 70 it will yield before any undue or injurious strain is placed on the upper by the extension of the fingers 12. The spring connection 23 affords, therefore, a yielding means for forcing the fingers outwardly, thereby
 75 preventing injury to the upper of the shoe, as might be the case if a positive actuation of the fingers were used. The plate 18 is returned to its normal position by a coiled spring 25, weaker than the spring 23, bearing
 80 at one end against the plate and at the other end against the frame of the machine. The several shoe forms are all identical in construction, except as to size, to the one described and a rotation of the turret brings
 85 them successively into position to be operated by the cam 19.

The operation of the machine is as follows:—The various parts of the machine being in their normal position with the auxiliary turning iron 6 retracted and the shoe
 90 form in its contracted position, the turning iron 1 is rocked to one side about its supporting shaft 5 and a shoe placed over the form in the position illustrated in the Letters
 95 Patent No. 706,038, hereinbefore referred to. After the shoe has been placed over the form in the proper position, the turning iron 1 is allowed to return to its normal position and in this position clamps the toe of the shoe
 100 to the form 11. The treadle 8 is then depressed which advances the auxiliary turning iron 6 to engagement with the sole of the shoe and simultaneously expands the form laterally. This expansion of the shoe
 105 form is the greatest at the shank and spreads the upper at this point outwardly to its full extent, this being determined by the tension of the spring 23. The operator then grasps the heel and shank of the shoe and
 110 draws it toward him at the same time gradually allowing the treadle 8 to spring upward which retracts the auxiliary turning iron 6 and allows the shoe form to gradually contract. As a continuously tapered
 115 surface is presented to the upper over which it must turn, there will be no tendency on the part of the upper to catch or bind at the point where the shank abruptly broadens out to form the ball of the shoe.
 120

Having thus described the preferred form of the present invention and the preferred mode of operating the same, it is desired to say that the construction is not to be considered as limited to the specific form
 125 herein shown and described but may include all forms which are covered by the appended claims.

I claim—

1. A forepart turning machine, having, in 130

combination, a turning iron arranged to engage the toe of the shoe, and a collapsible form arranged to engage the interior of the shoe and support the shoe during the turning operation, substantially as described.

2. A forepart turning machine, having, in combination, a turning iron, and a shoe form comprising means to spread the shank portion of the upper relatively more than the ball portion of the upper whereby the upper is prevented from binding during the turning operation, substantially as described.

3. A forepart turning machine, having, in combination, a turning iron, and a collapsible shoe form adapted in its expanded position to spread the shank portion of the upper and prevent injury to the shoe by binding at the ball portion of the sole during the turning operation, substantially as described.

4. A forepart turning machine, having, in combination, a turning iron, and a shoe form adapted to present a supporting surface to the interior of the upper which tapers from a point about midway of the shank to the toe of the shoe whereby a shoe may be turned without a tendency to bind at any point, substantially as described.

5. A forepart turning machine, having, in combination, a turning iron, and a collapsible shoe form adapted in its expanded position to present a supporting surface to the interior of the upper which has a continuous taper from the shank to the toe of the shoe, substantially as described.

6. A forepart turning machine, having, in combination, a turning iron, and a shoe form comprising a pair of laterally movable fingers adapted when in their extended position to present to the interior of the shoe a continuously tapered surface extending from the shank to the toe of the shoe, substantially as described.

7. A forepart turning machine, having, in combination, a turning iron, an auxiliary turning iron relatively movable thereto, a collapsible shoe form, and means for simultaneously advancing the auxiliary turning iron and for expanding the collapsible shoe form, substantially as described.

8. A forepart turning machine, having, in combination, a turning iron, and a shoe form comprising a support, fingers pivoted to the support and adapted to move laterally of the support, means for oscillating the fingers to expand or contract the shoe form as desired, substantially as described.

9. A forepart turning machine, having, in combination, a turning iron, a shoe form comprising a support, a pair of fingers pivoted at their front ends upon opposite sides of the support, a rod slidably mounted in the support, a stud mounted upon one end of

the rod and entering diagonal overlapping slots formed in the free ends of the fingers whereby a movement of the rod in a longitudinal direction will extend or contract the fingers laterally, substantially as described.

10. A forepart turning machine, having, in combination, a turning iron, a turret, a plurality of radially extending shoe forms mounted upon the turret, a plurality of fingers pivotally mounted upon each form, and means for extending the fingers laterally comprising a slidably mounted rod on each form operatively engaging one end of the fingers and a vertically movable cam surface mounted in the turret head and engaging the inner end of the rod on the form which is placed in operative position to move the same in a longitudinal direction, substantially as described.

11. A forepart turning machine, having, in combination, a turning iron, a collapsible shoe form, an auxiliary turning iron movable relatively to the first turning iron, actuating mechanism for the auxiliary turning iron, and means for extending the collapsible shoe form upon advancement of the auxiliary turning iron comprising a bell crank and a vertically movable wedge plate, the bell crank having one arm operatively connected to the actuating mechanism for the auxiliary turning iron and the other arm yieldingly connected to the wedge plate which is adapted to operate the collapsible shoe form upon movement in downward direction, substantially as described.

12. A forepart turning machine, having, in combination, a turning iron and a rigid support having an upper spreading device mounted thereon movable laterally in and out adjacent the shank portion of the form at each side thereof, substantially as described.

13. A forepart turning machine, having, in combination, a turning iron and a rigid support having an upper spreading device mounted thereon movable laterally in and out adjacent the shank portion of the form at each side thereof, and means for yieldingly expanding and collapsing said device, substantially as described.

14. A forepart turning machine, having, in combination, a turning iron, a rigid support having an upper spreading device at its shank portion, and means for yieldingly expanding such upper spreading device preliminary to the turning operation, said means permitting a yielding contraction of said device during the turning operation, substantially as described.

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