

A. L. ENGBERG.
MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES.
APPLICATION FILED NOV. 23, 1908.

1,023,826.

Patented Apr. 23, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

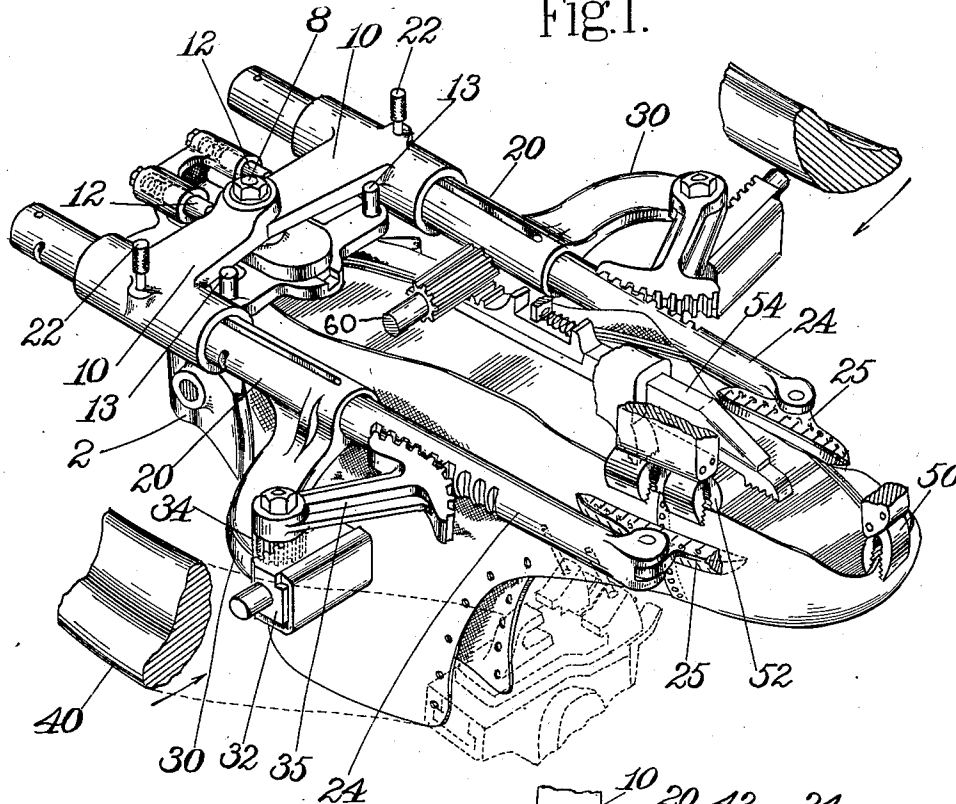


Fig. 3.

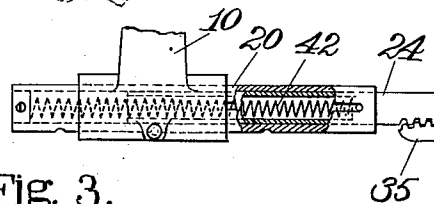


Fig. 4.

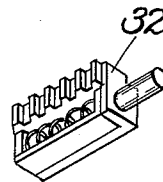
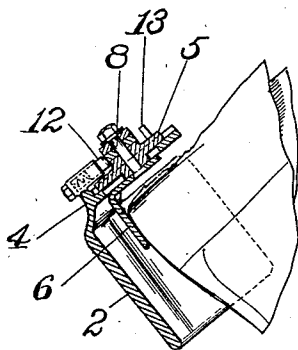


Fig. 2.



WITNESSES.

Elizabeth C. Coupe
Edith C. Hollbrook

INVENTOR.

David L. Engberg
By his Attorney,
Nelson W. Howard

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2 SHEETS-SHEET 2.

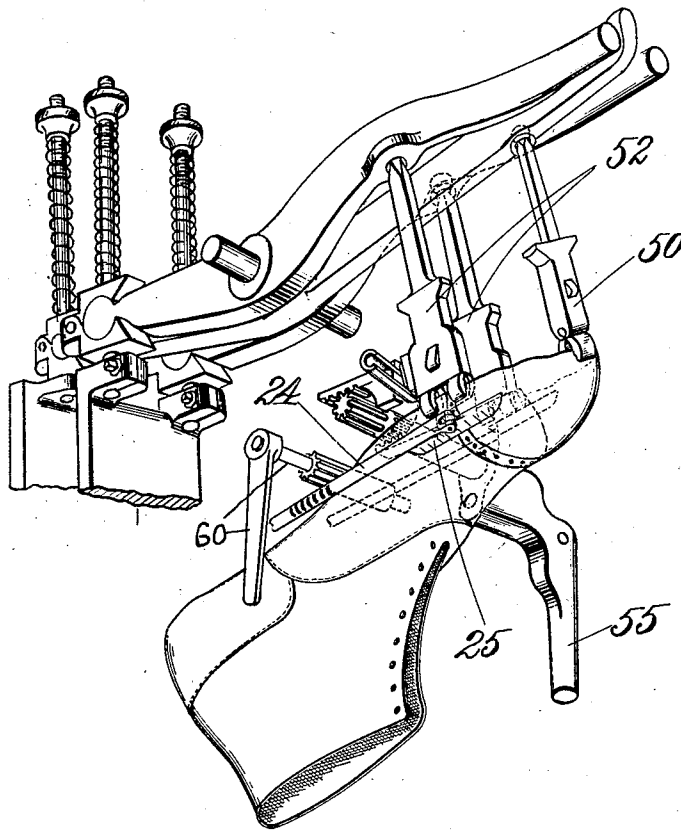


Fig. 5.

WITNESSES

Elizabeth C. Coyle
Edith C. Hallbrook

INVENTOR

David L. Engberg
By his Attorney,
Nelson W. Kottand

UNITED STATES PATENT OFFICE.

ARVID L. ENGBERG, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES.

1,023,826.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed November 23, 1908. Serial No. 464,137.

To all whom it may concern:

Be it known that I, ARVID L. ENGBERG, a citizen of the United States, and residing at Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Machines for Use in the Manufacture of Boots and Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for use in the manufacture of boots and shoes and particularly to apparatus for use in positioning an upper on a last.

The invention is herein shown as embodied in an attachment for a pulling over machine of the type shown in British patent No. 12,304 of 1903, and it may advantageously be embodied in other types of machines.

The general object of the invention is to facilitate the proper positioning of an upper on a last. There are certain lines in a shoe upper that must be located substantially in predetermined positions upon the last in order that the shoe shall have the intended appearance. One of these lines is the toe tip line usually marked by a seam. This line must be located in each shoe of a pair and in every pair of shoes of a given size and style at substantially the same distance from the end of the last to give the same "length of tip" in both shoes and it must have a definite angular relation to the longitudinal axis of the last in each shoe in order to present a "straight" tip. In the use of pulling over machines as heretofore equipped the operator's eye is depended upon to determine if the tip is the right length and if it is straight. A pocket measuring instrument called a tip measure is sometimes used but the use of this is avoided as much as possible because of the time consumed in picking it up from the work bench, applying it, and replacing it where it can be readily found again. These devices are also unsatisfactory because they measure from the toe end of the shoe backwardly and the toe gripper usually pulls the upper forwardly more or less and holds it away from the end face of the last so that the measuring device ap-

plied to a shoe in the pulling over machine does not indicate accurately the length which the tip will have in the lasted shoe.

An important feature of this invention consists in providing means for indicating accurately the exact position of the upper with relation to the length of the last. This indicating means is arranged to take its measurement from the heel end of the last and as herein shown it is operatively connected with the heel rest of the machine which is automatically moved forwardly into firm and uniform engagement with the shoe whatever may be the size or shape of the last. The heel end of the shoe in the pulling over machine is always in substantially uniform condition and affords an accessible point from which measurement can be taken. The measuring or indicating means herein shown includes two plates or gages located at opposite sides of the shoe and marked with graduations which may show the correct position for a normal tip for each size of shoe. Yielding means is provided for holding the indicating plates or gages normally away from the shoe position and operative connections are provided with the moving parts of the machine for moving the gages laterally of the shoe into operative relation with the upper at the side of the last or extending from the last to the grippers after the upper has been pulled and while it is held under tension. The machine preferably comprises means for adjusting the upper longitudinally about the last to straighten the tip line if the gages indicate that it does not occupy the desired angular relation to the longitudinal axis of the last. The machine will also preferably include means for relatively adjusting the upper and the last lengthwise to change the relation of the tip line to the length of the last for shortening or lengthening the tip.

The most convenient position in which to utilize the gages is at the sides of the shoe adjacent to and just below the grippers as above suggested, and in accordance with another feature of this invention means is provided for automatically retracting the gages lengthwise of the shoe to withdraw them from the path of the parts of the machine which are concerned in securing the stretched and adjusted upper in pulled over

position upon the last bottom. For thus retracting the gages they are slidably supported and are operatively connected, as by a rack and segment, with a spring pressed plunger which stands in the path of the inwardly swinging side clamp carrying arms to be engaged thereby for drawing back the gages before the side clamps and the tacking mechanisms reach the shoe. Provision is made for adjusting the gages to the different groups of sizes of shoes as children's, women's and men's.

These and other features of this invention including certain details of construction and combinations of parts will more fully appear in connection with the following description of the mechanism in which I have shown the invention as embodied.

Figure 1 is a perspective view showing the measuring devices in operative relation to a shoe, the upper of which is held by the pulling-over machine grippers. Fig. 2 is a vertical section through the rear portion of Fig. 1. Fig. 3 is a plan view partly in section of parts shown in Fig. 1. Fig. 4 is a perspective view of a device which will be described. Fig. 5 shows another view with parts in the same relation as in Fig. 1, this view being taken from approximately the position from which the pulling-over machine operator views the shoe.

The heel rest 2, upon which the gaging mechanism is carried, may be substantially the same as the heel rest shown in the patent above mentioned and may be similarly connected to the mechanism for moving it into firm engagement with the heel end of the last. A bracket 4 is projected forwardly from the upper edge of the heel rest and slotted to form a support for a sliding block 5 which carries a depending feeler 6 adapted to engage the heel end face of the shoe, as shown in Fig. 2. The block 5 carries a pivot bolt 8 on which are overlapping adjacent ends of two bell cranks 10. Spring plungers 12, mounted in the bracket 4, are arranged to engage the rear sides of lateral arms of the bell cranks 10 and push those arms together with the slide 5 forwardly to hold the front faces of the arms in engagement with studs 13, which project upwardly from lateral extensions of the bracket 4, as shown in Fig. 1. The studs 13 are located near the outer ends of the arms 10 so that as the connected ends are pressed forwardly by the plungers 12 the arms which fulcrum against the studs 13 swing the forwardly extending arms of the bell cranks outwardly. These forwardly extending arms of the bell cranks 10 are made tubular to receive bars 20 which are held in longitudinal adjusted position in the bell cranks by pins 22, which extend downwardly from the bell cranks and into recesses in the sides of the bars. These pins also hold the rods against

turning in the bell cranks. The bars 20 are themselves formed as tubes so that they have telescoping engagement with the rack bars 24 upon the front ends of which are pivoted the gages 25. These gages are plates or bars which may be formed triangular in cross section, as shown best in Fig. 1, and will have graduations marked on their upper and their outer faces. These graduations may be suitably spaced to represent positions for the tip line of shoes of different sizes. The adjustment provided by the pins 22 permits the gages to be positioned for use on the different groups of sizes of shoes, such as children's, women's, and men's. The triangular formation of the gages permits the operator to see clearly the marking on the outer inclined sides of the gages. The pivotal connection of the gages to the rack bars 24 permits the gages to adapt themselves to the inclinations of the sides of the shoe, right and left shoes frequently being inclined more on their outer sides than on their inner sides. Each of the bars 20 has an outwardly projecting arm 30 in the end of which is formed a slideway for a toothed block 32 in engagement with a pinion 34 pivoted on the arm 30 and connected to a toothed segment lever 35. The toothed lever 35 engages teeth on the rack bar 24. The sliding block 32 has an outwardly projecting stud which stands in the path of the swinging arm 40 carrying the side clamps or last supporting devices, as fully explained in said patent.

The arrangement of the parts so far described is such that when the heel rest is advanced into engagement with the shoe the feeler 6 engages the heel end face of the shoe and is forced rearwardly by such engagement against the pressure of the spring plungers 12. In this movement the pivot 8 carries the inner ends of the transverse arms of the bell cranks 10 backwardly, causing them to fulcrum upon the spring plungers and thereby rocks the forwardly projecting or gage carrying ends of the levers inwardly toward the shoe. This brings the gages automatically into contact with the upper in the region of the tip line while the pincers are pulling the upper so that when the machine comes to rest, as explained in said patent, to give the workman an opportunity to inspect the shoe and adjust the upper he finds the gages in position to indicate the position of the tip line and guide him in making any adjustment which may be necessary. When the machine is restarted the arms 40 are swung inwardly in the manner and by the mechanism described in said patent and contact with the slide blocks 32 for pressing them in the direction to cause the segment levers 35 to retract the gages and thus move them out of the path of the incoming side clamps and out of the

path of the tacking devices of the machine. The upper is shown in Figs. 1 and 5 as gripped and held under tension by the toe gripper 50 and side grippers 52, the last being rested against the bottom rest 54 as well as against the heel rest 2. The side grippers are connected together for movement simultaneously in opposite directions lengthwise of the last by the hand lever 55 (Fig. 5) through mechanism which is fully described in said prior patent and need not be herein explained. This mechanism, known as the "tip straightening" mechanism of the machine, is adapted to be actuated by the operator for adjusting the upper longitudinally about the last to position the tip line angularly with relation to the longitudinal axis of the shoe. By comparing the position of the tip line of the upper with the marking on the gages the operator can tell exactly the relation of the tip line to the length of the last and also its relation to the longitudinal axis of the shoe and if the latter relation is not correct he can adjust the upper by the hand lever 55. If the relation of the tip line to the length of the last is not that which is desired the upper may be pulled forwardly by the hand lever connected to the toe gripper 5, as shown in said prior patent, or the last may be moved either forwardly or backwardly by the sole rest 54 and its connection with the hand lever 60, also fully explained in said prior patent. After the adjustments have been made for correctly positioning the upper upon the last and after the machine has been restarted to effect the fastening of the upper the arm 40 swings outwardly, permitting the springs 42, which are interposed between the rack bars 24 and the bars 20, to advance the gages again to their normal position. The heel rest is also retracted, permitting the plungers 12 to press forward the inner ends of the transverse arms of the bell cranks 10, causing said arms to fulcrum on the studs 13 and swing the gages outwardly away from the shoe to permit the ready removal of the pulled-over shoe and the insertion of the next shoe to be operated upon.

Having explained the nature of this invention and described a preferred construction embodying the same in the best form now known to me, I claim as new and desire to secure by Letters Patent of the United States:

1. A machine of the class described having in combination means for resting a shoe, and measuring devices supported for movement into and out of operative relation to the opposite sides of the shoe.

2. A machine of the class described having in combination means for resting a shoe, means for pulling the upper having provision for manual movement to adjust the

upper about the last, and gages for indicating the relation of the tip line of the upper to the last at the sides of the shoe.

3. A machine of the class described having in combination means for resting a shoe, means for gripping the upper at the sides of the forepart, said machine having provision for relative movement of the last and the gripping means to adjust the upper on the last, and gages arranged to indicate at the opposite sides of the last the relation of the tip line to the last.

4. A machine of the class described having in combination means for resting a shoe, and gages arranged to measure at each side of the shoe from the heel end face of the last forwardly to indicate the relation of tip line to the length of the shoe.

5. A machine of the class described having in combination means for resting a shoe, and gages located at opposite sides of the forepart of the shoe while it is sustained by said resting means and a member which is operatively connected with said gages and is arranged to position the gages lengthwise of the shoe by contact with one end face of the last.

6. A machine of the class described having in combination means for resting a shoe, and measuring means having a member to engage the heel end face of the shoe and a member operatively connected therewith and adapted to occupy a position adjacent to the tip line of the upper.

7. A machine of the class described having in combination means for resting a shoe, and measuring means having a member adapted to engage the heel end face of the shoe and a member adapted to be brought automatically into operative relation to the shoe at the tip line when the first member engages the heel.

8. A machine of the class described having in combination means for resting a shoe, and a tip gage mounted at the side of the shoe and arranged for movement in a substantially horizontal plane from and toward operative relation to the upper at the ball of the shoe.

9. A pulling-over machine having, in combination, shoe resting means, pulling-over means, and tip measuring means having a constant relation to the heel end of the shoe.

10. A machine of the class described having in combination means for resting a shoe, and tip measuring means having a constant relation to the heel end face of the last, and devices for measuring the shoe from the heel end face forwardly, said machine having provision for relatively shifting the upper and the last to position the tip line of the upper.

11. A machine of the class described having, in combination, means for resting a

shoe, a tip measuring gage movable laterally from and toward the sides of the fore part of the shoe, and means for actuating the gage.

5 12. A machine of the class described having, in combination, means for resting a shoe, tip measuring gages movable laterally from and toward the sides of the fore part of the shoe, and power driven means for actuating the gages.

10 13. A machine of the class described having, in combination, means for resting a shoe, a tip measuring gage movable laterally from and toward one side of the fore part of the shoe, and means for actuating the gage lengthwise of the shoe.

15 14. A machine of the class described having, in combination, means for resting a shoe, tip measuring gages, and automatically operating means for moving the gages together laterally from and toward the shoe and longitudinally of the shoe into and out of tip measuring position.

20 15. A machine of the class described having, in combination, means for resting a shoe, tip measuring gages located at opposite sides of the fore part of the shoe adjacent to the ends of the tip line of the upper, and means for relatively moving the last and the upper lengthwise of the shoe to position the tip line of the last.

25 16. A machine of the class described having, in combination, means for resting a shoe, tip measuring gages located at opposite sides of the fore part of the shoe adjacent to the ends of the tip line of the upper, and means for relatively moving the upper and the last to shift the upper about the last for positioning the tip line angularly with relation to the longitudinal axis of the shoe.

30 17. A machine of the class described, having means for resting a last, means for pulling an upper over the last, means for clamping the last for the tacking operation, combined with tip measuring gages constructed and arranged to be moved from and toward tip measuring position by the movement of the side clamps.

35 18. An apparatus of the class described having, in combination, gage carrying levers, gages mounted on said levers for movement from and toward opposite sides of a shoe, and means connected with said levers and adapted for engagement with the shoe to move the gages.

40 19. A pulling-over machine having, in combination, means for resting a shoe, means for pulling the upper, means for fastening the upper, tip measuring gages adapted to be positioned adjacent to the sides of the shoe, and means for automatically withdrawing the gages from operative position to permit the operation of the fastening mechanism.

20. In tip measuring means for a pulling-over machine arranged to operate upon a shoe with the sole uppermost and the toe end inclined upwardly, a gage arranged to be positioned adjacent to the tip line at the side of the shoe and having a face with graduations marked thereon inclined outwardly and downwardly from the side of the shoe.

21. In tip measuring devices, gages arranged to contact with opposite sides of the shoe and formed substantially triangular in cross section with graduations marked on the oblique, outwardly inclined faces of the gages.

22. In tip measuring means, gages supported at opposite sides of a shoe adjacent to the tip line and arranged for free movement upon their supporting means to permit them to adapt their positions to the contour of the last whereby they can lie closely against the side of the shoe.

23. A machine of the class described, having means for supporting a last, means for pulling an upper over the last, tip measuring gages movable into and out of tip measuring position, and means adapted to be engaged by the shoe to move the gages into tip measuring position.

24. A machine of the class described, having means for resting a shoe, a tip measuring gage movable laterally toward and from the fore part of the shoe, and means controlled by the shoe for effecting such movements.

25. A machine of the class described having, in combination, means for pulling an upper over a last, a movably mounted tip measuring gage, and means for moving said gage into tip measuring position as the shoe is presented to the pulling over means and for moving the gage out of such position upon withdrawal of the shoe.

26. A machine of the class described having, in combination, means for pulling an upper over a last, tip measuring gages mounted for movement toward and from opposite sides of the fore part of the shoe, and means for moving said gages into tip measuring position as the shoe is presented to the pulling over means and for moving the gages out of such position upon withdrawal of the shoe.

27. A machine of the class described having, in combination, means for resting a shoe, laterally movable bell cranks carrying gages, means controlled by the insertion of the shoe to actuate the bell cranks and thereby move the gages toward the shoe, and means to remove the gages from the shoe.

28. A machine of the class described having, in combination, means for resting a shoe, laterally movable bell cranks carrying gages, yielding means acting on the bell

cranks to hold the gages away from the shoe, and means controlled by the shoe to actuate the bell cranks in opposition to said yielding means and move the gages toward the shoe.

29. A machine of the class described having, in combination, means for resting a shoe, laterally movable bell cranks carrying gages, a pivot connecting oppositely extending arms of said bell cranks, a feeler connected with said pivot arranged for engagement by the shoe to cause movement of the gages toward the shoe, and yielding means to reversely actuate the gages.

30. An apparatus of the class described having, in combination, means for resting a last, means for pulling an upper over the last, gage carrying levers comprising telescopic members, tip measuring gages carried by said levers for movement from and toward opposite sides of the upper, and means for clamping the upper to the last constructed to impart sliding movements to said telescopic members for moving the gages from and toward tip measuring position.

31. A machine of the class described having provision for adjusting a pulled upper about a last, and gages arranged at opposite sides of the shoe to indicate the relation of the tip line to the last.

32. A machine of the class described hav-

ing provision for adjusting a pulled upper about a last, and means arranged to indicate the relation of the tip line of the upper to the last at separate points located on the opposite sides of the last.

33. A machine of the class described having means for pulling an upper lengthwise on a last, said machine having provision for adjusting the upper on the last and means for indicating the relation of the tip line of the upper to the last.

34. A machine of the class described having provision for adjusting a pulled upper about a last and means for indicating to the operator the angular relation of the tip line of the upper to the longitudinal axis of the last.

35. A pulling-over machine having, in combination, means for lasting a shoe, pulling-over means, gages arranged to indicate at each side of the shoe the relation of the tip line to the length of the last, and operating mechanism for said pulling-over means and gages.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARVID L. ENGBERG.

Witnesses:

HERBERT W. KENWAY,
ARTHUR L. RUSSELL.