R. F. McFEELY.

MACHINE FOR OPERATING ON SHOES.

APPLICATION FILED OCT. 7, 1914.

1,197,516.

Patented Sept. 5, 1916.

2 SHEETS—SHEET 1.

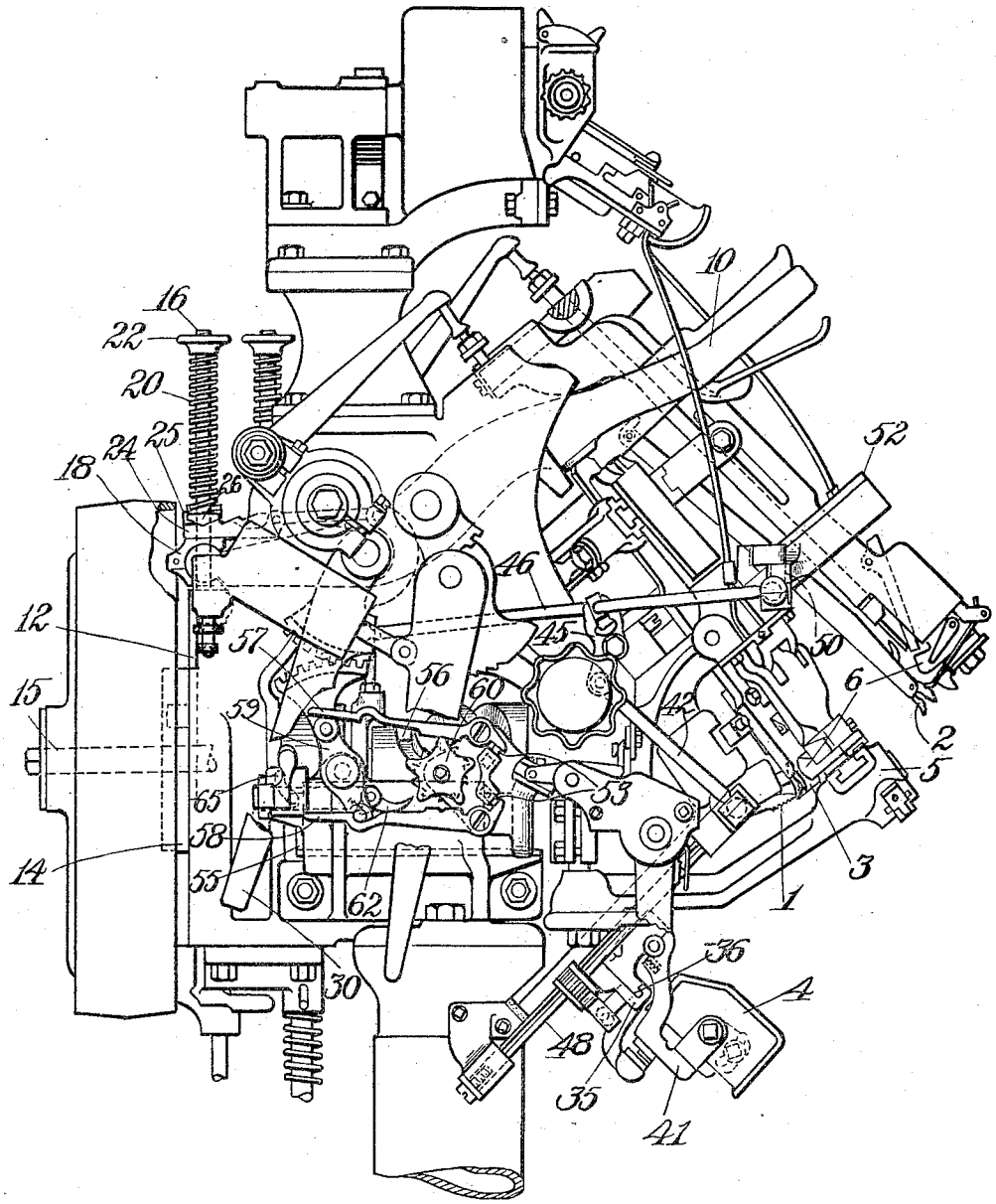


Fig. 1.

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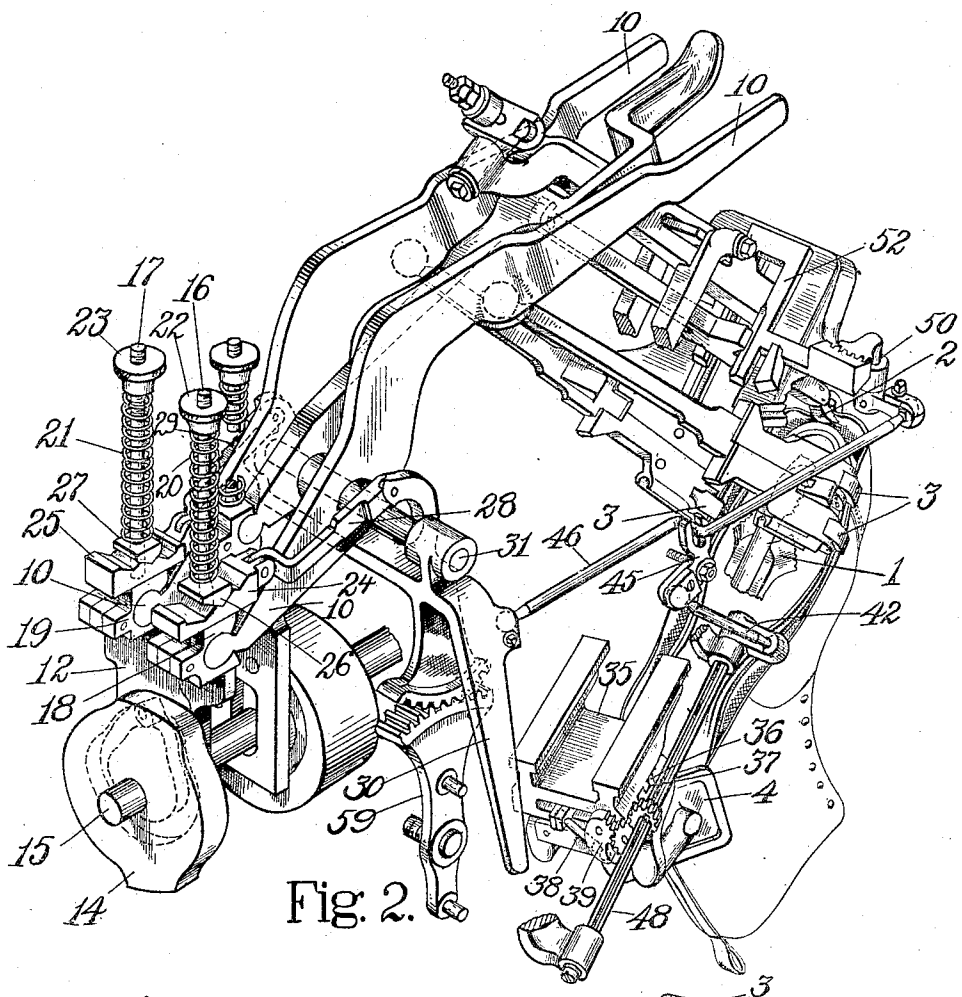


Fig. 2.

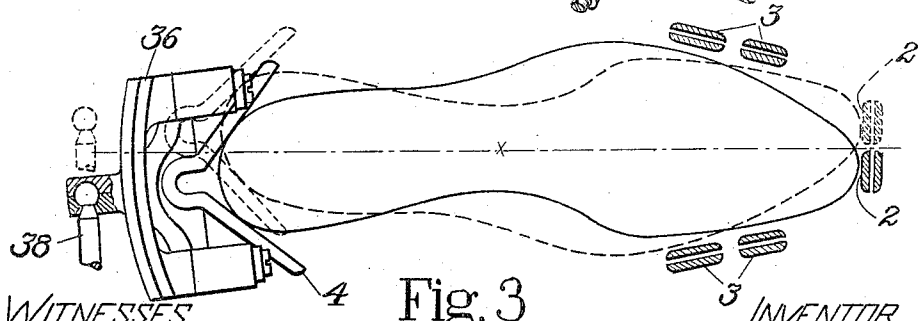


Fig. 3

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UNITED STATES PATENT OFFICE.

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MACHINE FOR OPERATING ON SHOES.

1,197,516. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed October 7, 1914. Serial No. 865,499.

To all whom it may concern:

Be it known that I, RONALD F. McFEELY, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Machines for Operating on 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 shoe machines and particularly to pulling-over machines and has for its object to improve machines for more efficient operation upon right and left crooked lasts and particularly to improve further the pulling-over and the pulling-over and lasting machines of my prior inventions to increase the excellence of their work.

Machines as heretofore constructed have been arranged for a greater or less degree of self-adaptation to the differences in condition presented by right and left lasts and this has been and is satisfactory in the great majority of cases. An increasingly high degree of excellence in the work produced by the pulling-over machine is, however, desired by some shoe manufacturers who are willing to pay a labor cost for operation of the machine compatible with the use of manual adjustments for right and left lasts. I have, therefore, provided means for manually adjusting the heel rest to support properly right and left lasts and means for adjusting the side grippers relatively to effect respectively the pull which is best adapted for use on the outer or little toe side of a right or a left last and on the inner or big toe side of said last. In this latter connection it should be understood that with the development of right and left crooked lasts the shape of the inner or big toe side of the last from the median line down over the top face to the edge of the last bottom has been made radically different from the shape of the outer or little toe side of the last. On the inner side the surface of the last extends approximately straight up from the sole to the top of the ball of the foot and then joins the surface of the top face of the last by an abrupt curve. On the inner side the surface of the last usually slants or curves in over the little toe and joins the top face of the last at a much less height and by a gentle curve. In fact, the highest point on the top face of the last is quite near the inner side of the last. In pulling the upper by the side grippers of the pulling-over machine it may be said, broadly speaking, that the inside gripper stretches the short portion of stock that extends from the highest point over the abrupt curve to the inner edge of the last and that the outer gripper stretches the long extent of stock running from the high point near the inner side of the last down the wide slope across to the little toe and then over the gentle curve to the edge of the outer side of the last. From this it will be readily seen that the inside gripper can advantageously make only a short pull and then yield while the outer gripper requires a long pulling movement in order to take the stretch in an equal degree out of the longer extent of stock which is acted upon by the outside gripper. It is of course obvious that in order to deal with stock having different degrees of elasticity, as well as uppers some of which fit the last more loosely than others, the yielding quality of the upper pulling movement which has characterized the commercially successful pulling-over machine of my former patents should be retained unimpaired.

Therefore, in addition to the broad features of invention which consist in providing means for effecting right and left adjustments of the side grippers and of the heel rest, an important feature of the invention consists in provision for obtaining the described short and the relatively long upper pulling movements respectively on the inner and the outer sides of right and left lasts. As a means for obtaining this result I have employed mechanism for simultaneously and oppositely changing the pulling tension of the side grippers operating on the outer and inner sides of the last. Of course, the broad result may be obtained by the use of various other means which are within the scope of this invention.

A further feature of this invention, by which the practical value of the improvements is increased because of the reduction in the labor cost of using the invention which this feature effects, consists in coupling together the adjusting means for two or more instrumentalities so that the time required to make one adjustment produces both or all of them. As herein embodied arrangements

are made for the adjustments of the heel rest and of the side grippers for right and left lasts to be made from a single adjusting lever. I have further provided for the adjustment of the toe gripper for right and left lasts, which is claimed in prior United States Letters Patent No. 1,135,949, granted April 13, 1915, on my co-pending application and showing a combined pulling-over and lasting machine, to be made simultaneously with the right and left adjustment of the side grippers and the heel rest. Furthermore, I have provided for the right and left adjustment of the toe tacker, provided for in prior United States Letters Patent No. 1,135,956, granted April 13, 1915, on my application for improvements in pulling-over machine tacker mechanisms, to be made simultaneously with the other adjustments for right and left pulling over.

Another very important feature of this invention consists in the provision of means to effect automatic adjustments of the machine for dealing with shoes on right and left crooked lasts. The use of this feature of the invention contemplates pulling-over the two shoes of each pair successively and such use is therefore preferably optional with the machine operator. The use of this feature eliminates the labor of making adjustments, already reduced to a minimum by connecting the side and toe grippers, the toe tacker and the heel rest to a single adjusting lever, and makes the machine as fast as a machine which has no adjustments for right and left pulling-over. This feature of the invention is herein shown as embodied in means which is connected with the power driving mechanism of the machine and is adapted to be caused at the end of the operation on a shoe for one foot to reset the adjusted parts ready to operate on the shoe for the other foot.

As I am advised, it is new by this invention to adjust a pulling-over machine for rights and lefts and it is broadly new to make the indicated adjustments of the side grippers and the heel rest, for any purpose whatever, and of course it is broadly new to make these several adjustments automatically. It is to be understood, therefore, that it is intended to protect this invention broadly without restriction to the embodiment of this invention herein disclosed.

These several features of the invention and others, including certain combinations of parts and details of construction, will now be described in connection with the accompanying drawings and then pointed out in the claims.

In said drawings, Figure 1 is a side view of a pulling-over machine embodying the present improvements in the best form now known to me; Fig. 2 is a perspective view showing the mechanisms most particularly concerned with the present invention; Fig. 3 is a plan showing in full and dotted lines a right and a left last inverted and the adjustments of the heel rest and of the toe gripper provided by this invention.

Those characteristics of the general organization of the machine will first be described which will be needed for best understanding the illustrated embodiment of the present invention.

The machine includes a sole rest 1 against which the bottom face of the shoe is positioned to locate the shoe vertically and hold the last against the strain of the grippers on the upper. The toe end of the last is usually positioned against the inner face of the inner jaw of the toe gripper 2 to locate the last longitudinally in the machine and to center the toe transversely of the machine. The last is also positioned approximately centrally between the side grippers 3, 3. In so locating the shoe the upper is positioned within the jaws of the grippers and when the machine is started the grippers are closed and updrawn to seize and stretch the upper, the sole rest being also depressed to sink the last into the pulled upper. After the pulling movement the heel rest 4 is advanced from a retracted position, where it is out of the way of positioning and sinking the last, into heel embracing position, being advanced yieldingly to adapt it to the length of the last and then locked to hold the last against backward displacement during the subsequent overdrawing and tacking of the upper at the toe of the shoe. The sides of the heel rest are inclined so that the rest centers itself accurately with relation to the heel as it advances and then holds the heel of the last against lateral displacement. After inspection and adjustment of the upper the machine is again started and side clamps 5 are moved in under the opposite sides of the forepart of the last to sustain it against the action of the tack drivers, the grippers are moved inwardly to draw the upper over the edge of the shoe innersole and the tackers 6 are moved inwardly and insert the upper fastening tacks.

The upper pulling movement of the side grippers is effected by levers 10, 10 from the front ends of which the grippers are suspended and the rear ends of which are connected to a slide 12 having a roll standing in a track of a cam block 14 on the shaft 15. The two rods 16, 17 rising from the slide 12 extend through the forked rear ends of the levers 10, and through blocks 18, 19 embracing the cylindrical ends of the levers. These rods are encircled by springs 20, 21 the initial tension of which is adjusted by screw-nuts 22, 23. Between the blocks 18, 19 and the updraw springs 20, 21 are spring tension adjusting wedges 24, 25 the lower

faces of which are plane to slide on the blocks and the upper faces of which are notched to coöperate with angular faced washers or plates 26, 27 against which the lower ends of the springs directly engage. For use in producing right and left adjustment of the side grippers the wedges 24, 25 are oppositely inclined so that when they are moved in the same direction one wedge will increase the pulling strength or the tension of the updraw spring with which it is associated and the other will simultaneously decrease that of its spring. The effect of this is that, after the side grippers have closed and begun simultaneously to pull, the spring whose tension was weakened by adjustment of its wedge will yield earlier and its gripper cease to pull sooner, while the other spring which was oppositely adjusted will not yield until later and its gripper will continue to pull longer. Thus the effect of proper adjustment of the wedges is simultaneously to shorten the pulling stroke or movement of the inside gripper and to lengthen the pulling movement of the outside gripper and thus cause the gripper at each side of the last to give the relative length of pull required for properly stretching the portion of upper upon which it is acting over the side of the last which for the time is presented to that gripper. The wedges 24, 25 are connected by links 28, 29 to short arms of a lever 30 which is fulcrumed on a fixed rod 31.

The heel rest 4, which in the respects herein specified is mounted as is fully shown and described in my prior United States Letters Patent No. 1,029,387, has a transverse sliding connection with its carrier 35 formed by a tongue 36 and groove 37 curved in the arc of a circle the center of which will be about at the point of intersection of the median lines of the forepart and the heel part of a crooked last which will be selected as a standard. This is the center discovered by Matthias Brock as the center about which to adjust relatively instrumentalities which it is desired to have operate symmetrically upon the end portions of right and left crooked lasts, as fully explained by him in United States Letters Patent No. 1,018,477, granted Feb. 27, 1912. This center comes usually about two-fifths of the distance from the toe backward toward the heel. Obviously parts having connections 36, 37 of different curvature may be provided for different styles of lasts. A link 38 extends from the rear of the heel rest for adjusting the rest transversely of the machine in said curved line for right and left lasts. The link is eccentrically connected to a segment gear 39, Fig. 2, which is turned from a pinion on a shaft 48. The pinion is splined on shaft 40 to allow it to accompany the heel rest in its movements to and from the shoe. The shaft is connected by a rocker arm and a link 42 with one arm of a bell-crank 45 the other arm of which is forked to be actuated by a connection 46 with the hand lever 30 so that simultaneous right and left adjustments of the side grippers and the heel rest are made by manipulation of the one lever 30. The connection 46 extends forwardly to a rock-shaft 50 having a segment gear and rack connection with a sliding guide 52 through which the toe gripper 2 and the toe tacker extend as shown and described in detail in said Patent No. 1,135,956. By this arrangement right and left adjustment of the toe gripper and of the toe tacker is made simultaneously with right and left adjustment of the side grippers and the heel rest. Of course, separate adjusting means for each or any of these instrumentalities might be employed, but the provision of one adjusting lever for all of them has the advantage that time and labor are saved in the use of the machine and the correct relation of each to the other is maintained. The notches in the right and left side gripper wedges 24, 25 hold the lever 30 in the position to which it and the parts connected with it are moved. There are three of these notches, the middle one of which is the neutral or central position, in which all of the parts are located for a straight last. The notches at either side of the middle one represent of course the adjustments for right lasts and for crooked lasts.

It should be noted that the right and left adjustment of the heel rest is an initial adjustment, and that the forked rest proper remains supported by the swinging links 41, Fig. 1, which permit the rest to have self-adjustment to adapt itself to the precise position in which the rest finds each particular shoe. An advantage of the initial adjustment is that it avoids the danger that the rest shall strike a shoe a substantial distance to one side of its correct relation to the shoe and, in compelling the shoe to adjust the rest so far, shall displace the shoe in the machine. This is particularly disadvantageous in a combined pulling-over and lasting machine. The shoe will without disadvantage make the final small shiftings of the rest required when the present invention is used but very crooked lasts are liable to be crowded out of place to some extent when this invention is not used.

The machine is automatically reset for pulling-over right and left shoes alternately through a connection between the hub of lever 30 and a power driven slide 55, Fig. 1, which is common to the machine of Patent No. 1,029,387. The slide has a roll standing in a cam groove 56 which is so arranged that the slide has an endwise movement toward the front of the machine after the shoe has been pulled and tacked and while the

several mechanisms are being restored to position to receive another shoe. The slide carries two hooked arms 57, 58, pivotally mounted one above the other and held pressed together by spring plungers 53. The hooks of the arms are adapted to engage studs on opposite arms of a rocking lever 59, the upper end of which is segment toothed and engages teeth on the hub of hand lever 30.

A five-pointed star wheel 60 is located between arms 57, 58 and carries a ratchet which is adapted to be engaged by a pawl 62 mounted on a carrier which is adjustably held endwise in the slide 55, the pawl being normally in position to engage and turn the star wheel one-tenth of a revolution at the end of the rearward stroke of the slide 55. The star wheel thus alternately positions the arms 57, 58 out of engagement with the studs on lever 59. As shown in Fig. 1 the arm 57 is held by the star wheel away from the lever 59 and the arm 58 is held by plunger 53 in such engagement with lever 59 that the lower end of said lever has been rocked forward. This movement, transmitted to the hub of hand lever 30, has swung that lever backward and set the machine, for example, for operating on a shoe on a right crooked last. Upon the starting of the machine to pull over the shoe the pawl 62 will engage the ratchet on the star wheel and turn that wheel to cause one of its points to force the arm 58 out of engagement with lever 59 and simultaneously to allow arm 57 to come into such engagement. As the pulling-over operation is completed the arm 57 will swing hand lever 30 forwardly and reset the machine for a left shoe.

The pawl 62 is rendered operative or inoperative to cause automatic adjustment of the machine for right and left shoes by a cam 65 which is confined against endwise movement but can be turned by an operating arm and has a cam track in which stands a stud that is on the pawl carrier. By turning the cam 65 upwardly from the position shown in Fig. 1 the pawl will be retracted to a position where it will first turn the star wheel one half its normal movement and will then be unable to engage another tooth. This will leave the star wheel so positioned that it will hold both arms 57 and 58 out of operative engagement with the lever 59, thus leaving the hand lever 30 free for manual manipulation to set the machine for rights and lefts at the will of the operator.

From the foregoing it will be seen that this invention provides, embodied in a pulling-over machine but broadly applicable to other shoe machines, mechanism which is adapted to perform the same operation with appropriate differences on right and left shoes, combined with means for automatically resetting the machine at the end of its operation on a right shoe and causing it to effect a predetermined difference in its operation on the next shoe.

Having explained the nature of this invention, and its contemplated use having been made clear in connection with the description of the illustrated embodiment of the invention, I claim as new and desire to secure by Letters Patent of the United States:—

1. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper, and means for adjusting simultaneously the operating mechanism for both side grippers to adapt the grippers for pulling-over uppers on right and left crooked lasts.

2. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper, and means for adjusting simultaneously the operating mechanism for both side grippers to cause the grippers to make a longer pull on the outer side of the last than on the inner side of the last.

3. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper, and means for adjusting simultaneously the operating mechanism for both side grippers to cause either side gripper alternatively to make a longer pull than the other side gripper of the machine.

4. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper, and means for adjusting simultaneously the operating mechanism for both side grippers to adapt the grippers for pulling-over uppers on right and left crooked lasts by pulling harder on the outer side of the shoe, whether right of left, than on the inner side of the shoe.

5. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper including yielding elements through which the pulling force is transmitted to the grippers, and means for simultaneously and oppositely adjusting the yielding elements to cause one gripper to continue its pulling movement after the other gripper has ceased its pulling movement.

6. A pulling-over machine having, in combination, grippers arranged to engage

an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper including yielding elements through which the pulling force is transmitted to the grippers, and means for simultaneously and oppositely adjusting the tension of said yielding elements.

7. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper including yielding elements through which the pulling force is transmitted to the grippers, oppositely arranged wedges associated with the yielding elements for the two side grippers and means for adjusting said wedges to increase the tension of one yielding element and decrease that of the other one.

8. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper including springs through which the pulling force is transmitted, relatively movable wedges arranged to control the tension of said springs and means for simultaneously adjusting the wedges to increase the tension of the spring associated with one side gripper and to decrease that of the spring through which the other side gripper is operated.

9. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper including springs through which the pulling force is transmitted, relatively movable wedges arranged to control the tension of said springs, means to retain both wedges in the relation in which the tension of the springs is equal, means for relatively adjusting the wedges to make the tension of one spring different from that of the other to a predetermined extent, and means to retain such adjustment.

10. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last, operating mechanism for causing the grippers to seize and pull the upper including springs through which the pulling force is transmitted, relatively movable wedges arranged to control the tension of said springs, said wedges being oppositely inclined and having each three similarly arranged notches of which the middle ones are opposite to each other and the lowest notch on one wedge is opposite to the highest one on the other wedge, a device under each spring to cooperate with the wedge notches in retaining the adjustment of the wedges, and means for moving said wedges simultaneously to obtain equal or different tensions in the said springs.

11. A pulling-over machine having, in combination, gripper mechanism including grippers arranged to seize an upper at opposite sides of a last and at the toe and pull the upper, and means for adjusting said mechanism including the toe gripper for pulling-over uppers on right and left crooked lasts differently.

12. A pulling-over machine having, in combination, gripper mechanism including grippers arranged to seize an upper at opposite sides of a last and at the toe and pull the upper, and means for effecting adjustment to change the relative lengths of pull effected by the grippers at opposite sides of the last and for changing the position of the toe gripper for adapting said grippers to pull over uppers on right and left crooked lasts.

13. A pulling-over machine having, in combination, grippers arranged to engage an upper at opposite sides of a last and grippers to engage the upper at the toe of the last, operating mechanism for causing the grippers to seize and pull the upper and means for adjusting simultaneously the operating mechanism for both side grippers and changing the position of the toe gripper to adapt said grippers for operation on right and left crooked lasts.

14. A pulling-over machine having, in combination, gripper mechanism including grippers arranged to seize an upper at opposite sides of a last and at the toe and pull the upper, and means for adjusting said mechanism to cause the gripper located at the outer side of the last to pull harder than the opposite gripper and to cause the toe gripper to engage the upper at the side of the median line of the machine on which the inner side of the shoe is located.

15. A pulling-over machine having, in combination, gripper mechanism including grippers arranged to seize an upper at opposite sides of a last and at the toe and pull the upper, and means for simultaneously adjusting the operating mechanism for the side grippers and the position of the toe gripper.

16. A pulling-over machine having, in combination, gripper mechanisms arranged to pull an upper at opposite sides of a last, and operating mechanism arranged to automatically operate the side gripper mechanisms differently for pulling-over right shoes and left shoes on crooked lasts.

17. A pulling-over machine having, in combination, gripper mechanisms arranged to pull an upper at opposite sides of a last, and operating mechanism including means which at the will of the operator can be made automatically to produce alternate actuations of the side gripper mechanism differing from each other and suited respectively for pulling-over right and left shoes on crooked lasts.

18. A pulling-over machine having, in combination, gripper mechanisms and operating mechanism including means which at the will of the operator can be made automatically to produce alternate actuations of the gripper mechanisms differing from each other and suited respectively for pulling-over right and left shoes on crooked lasts.

19. A pulling-over machine having, in combination, last positioning means, upper pulling means and operating mechanism constructed and arranged to effect automatically at alternate operations of the machine adjustments suited respectively to pulling-over right and left shoes on crooked lasts.

20. A pulling-over machine having, in combination, upper fastening means and operating mechanism constructed and arranged to effect automatically alternate adjustments of the fastening mechanism suited respectively to operating upon right and left shoes on crooked lasts.

21. A pulling-over machine having, in combination, last positioning means, upper pulling means and operating mechanism constructed and arranged to effect automatically at alternate operations of the machine adjustments of the pulling means suited respectively to pulling-over right and left shoes on crooked lasts.

22. A pulling-over machine having, in combination, last positioning means, upper pulling means and operating mechanism constructed and arranged to effect automatically at alternate operations of the machine adjustments of the last positioning means suited respectively to pulling-over right and left shoes on crooked lasts.

23. A pulling-over machine having, in combination, last positioning means, upper pulling means and operating mechanism constructed and arranged to effect automatically at alternate operations of the machine adjustments of the relative upper pulling forces applied at the opposite sides of the shoe.

24. A pulling-over machine having, in combination, gripper mechanisms arranged to pull an upper at opposite sides of a last, operating mechanism therefor, and connected means to effect adjustment of both side gripper mechanisms to compensate for the difference in the shapes of right and left lasts at their inner and outer sides and by such adjustment to cause the side gripper mechanisms to effect an upper stretching which shall be the same at the outer sides of both right and left lasts and different from that which is effected at the inner sides of said lasts.

25. A pulling-over machine having, in combination, gripper mechanisms arranged to pull an upper at opposite sides of a last, operating mechanism therefor, and automatic means to effect adjustment to compensate for the difference in the shapes of right and left lasts at their inner and outer sides and by such adjustment to cause the side gripper mechanisms to effect an upper stretching which shall be the same at the outer sides of both right and left lasts and different from that which is effected at the inner sides of said lasts.

26. A pulling-over machine having, in combination, pulling-over means, a heel rest, and a heel rest shifter for positioning the heel rest at one lateral side of the median line of the machine for operation on one shoe and then at the opposite lateral side of the machine for operation on the next shoe.

27. A pulling-over machine having, in combination, pulling-over means, a heel rest, and means independent of the shoe for automatically positioning the heel rest at one lateral side of the median line of the machine for operation on one shoe and then at the opposite lateral side of the machine for operation on the next shoe.

28. A pulling-over machine having, in combination, pulling-over means, a heel rest, a support on which the rest is freely movable laterally, and means to adjust said support laterally of the machine for right and left shoes.

29. A pulling-over machine having, in combination, pulling-over means, a heel rest, and a support on which the rest is freely movable laterally, said support being adjustable laterally of the machine for right and left shoes.

30. A pulling-over machine having, in combination, pulling-over means, a heel rest, a support on which the rest is freely movable laterally, and a carrier in which the suport is adjustable laterally in an arc about a center located at such a point between and removed from the ends of the shoe that the rest will be positioned to act uniformly upon a shoe on a right crooked last and upon a shoe on a left crooked last.

31. A pulling-over machine having, in combination, grippers for pulling an upper at opposite sides of a last, operating mechanism for said grippers, and means operating automatically to reset the machine for pulling-over the next shoe differently from what it was set for pulling-over the last preceding shoe.

32. A pulling-over machine having in combination, mechanism adapted to pull over shoes on right and left crooked lasts and means adapted for operation automatically to reset said mechanism to adapt it after pulling-over a right shoe to effect the apropriately different pulling-over operation on a left shoe.

33. A pulling-over machine having, in combination, mechanism adapted to pull over shoes on right and left crooked lasts and automatic actuating mechanism there-

for including means which can be rendered operative or inoperative to reset the machine alternately to pull over a right shoe and then differently to pull-over a left shoe.

34. A pulling-over machine having, in combination, mechanism adapted to pull-over shoes on right and left crooked lasts and including a toe gripper, and automatic actuating mechanism to reset the toe gripper alternately to pull-over a right shoe and then differently to pull-over a left shoe.

35. A pulling-over machine having, in combination, mechanism adapted to pull-over shoes on right and left crooked lasts and including a toe gripper, and automatic actuating mechanism which can be rendered operative or inoperative to reset the toe gripper alternately to pull-over a right shoe and then differently to pull-over a left shoe.

36. A pulling-over machine having, in combination, mechanism adapted to pull-over shoes on right and left crooked lasts and including side gripper mechanism acting at opposite sides of the last and automatic actuating mechanism to reset said side gripper mechanism alternately to pull-over a right shoe and then appropriately differently to pull-over a left shoe.

37. A pulling-over machine having, in combination, mechanism adapted to pull-over shoes on right and left crooked lasts and including side gripper mechanism acting at oposite sides of the last and automatic actuating mechanism which can be rendered operative or inoperative to reset said side gripper mechanism alterately to pull-over a right shoe and then appropriately differently to pull-over a left shoe.

38. A pulling-over machine having, in combination, mechanism adapted to pull-over shoes on right and left crooked lasts and including a toe gripper and a heel rest and automatic means to reset said toe gripper and heel rest laterally first toward one side of the machine for working on a shoe for one foot and then toward the other side of the machine for working on a shoe for the opposite foot.

39. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on right and left shoes and means for automatically resetting said machine at the end of its operation on a right shoe and causing it to effect a predetermined difference in its operation on the next shoe.

40. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on right and left shoes and means which can be rendered operative or inoperative for automatically resetting said machine at the end of its operation on a right shoe and causing it to effect a predetermined difference in its operation on the next shoe.

41. A machine for operating on shoes on right and left crooked lasts having, in combination, mechanism for performing at the opposite sides of the shoe an operation which differs at the two sides appropriately to the difference in the shape of the left and the right sides of a crooked last, and means for automatically resetting the machine to operate with appropriate differences on right and left crooked lasts alternately.

42. A machine for operating on shoes on right and left crooked lasts having, in combination, mechanism for performing at the opposite sides of the shoe an operation which differs at the two sides appropriately to the difference in the shape of the left and the right sides of a crooked last, and means which can be rendered operative or inoperative for automatically resetting the machine to operate with appropriate differences on right and left crooked lasts alternately.

43. A machine for operating on shoes on right and left crooked lasts having, in combination, mechanism for performing at the opposite sides of the shoe simultaneously an operation which differs at the two sides appropriately to the difference in the shape of the left and the right sides of a crooked last, and means for automatically resetting the machine to perform on the left side of one shoe the operation last performed on the right side of the previous shoe and on the right side of the shoe the operation last performed on the left side of the previous shoe.

44. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on one end of right and left shoes, and means for automatically resetting said machine between the operation on one shoe and the operation on the next shoe to perform its operations with appropriate differences on right and left shoes alternately.

45. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on one end of right and left shoes, said mechanism including a toe gripper, and means for automatically shifting said gripper laterally toward one side of the machine for pulling-over a left shoe and laterally toward the opposite side of the machine for pulling-over a right shoe.

46. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on one end of right and left shoes, said mechanism including a toe gripper and a heel rest, and means for automatically shifting said gripper and rest laterally toward one side of the machine for pulling-over the shoe for one foot and later-

ally toward the other side of the machine for pulling-over the shoe for the other foot.

47. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on right and left shoes, said machine including means for acting on the upper at the toe end of the last and means for embracing the heel end of the last, and mechanism independent of the work for automatically shifting said two means relatively in a direction transverse of the machine toward one side and then toward the other at alternate operations of the machine to adapt the relative position of said means to right and left shoes alternately.

48. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on right and left shoes, said machine including means for overworking the upper of the forepart of the shoe and means for embracing the rear end of the last, and mechanism acting independently of the work for automatically shifting said overworking and heel embracing means relatively toward one side of the machine into relation for operating on shoes for one foot and toward the other side of the machine into relation for operating on shoes for the other foot.

49. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on right and left shoes, said machine including an abutment to engage the toe end face of the last, and mechanism for automatically shifting said toe end abutment laterally toward one side of the machine for positioning a right shoe to receive the operation of said mechanism and then toward the other side of the machine for positioning a left shoe to receive the operation of said mechanism in the next cycle of the machine.

50. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on right and left shoes, said machine including an abutment to engage the heel end of a last, and mechanism for automatically shifting said heel end abutment laterally toward one lateral side of the machine into position for resisting displacement of a right shoe by the operation of said mechanism on the shoe and then automatically shifting said abutment toward the other lateral side of the machine for use with a left shoe.

51. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on right and left shoes, said machine including heel embracing means adapted to assist in holding the shoe for the operation of said mechanism upon the shoe and mechanism independent of the work and which can be rendered operative or inoperative for automatically shifting said embracing means toward one lateral side of the machine for one cycle of the machine and toward the other side for the next cycle for treatment of right and left shoes alternately.

52. In a machine for operating on shoes the combination with mechanism for overworking the upper of the forepart of a shoe, of means for acting upon the rear part of the shoe constructed and arranged to permit of lateral adjustment about a center located at such a point between and removed from the ends of the last that said means may be positioned to act uniformly upon a shoe on a right or a left crooked last, and means for automatically adjusting said means about said center first toward one lateral side of the machine and then toward the other for working on right and left shoes alternately.

53. In a machine for operating on shoes the combination with means for positioning the forepart of a shoe, of means for acting upon the rear part of the shoe constructed and arranged to permit of lateral adjustment about a center located approximately at the intersection of the median lines of the forepart and the heel part of the last, and mechanism for automatically making such lateral adjustment first toward one side of the machine and then toward the other side for adapting the machine to operate alternately on a shoe on a right last and then on a shoe on a left last.

54. In a machine for operating on shoes the combination with mechanism for overworking the upper of the forepart of a shoe, of means for acting upon the rear part of the shoe constructed and arranged to permit of lateral adjustment, and means for automatically adjusting said means first toward one lateral side of the machine and then toward the other for working on right and left shoes alternately.

55. In a machine for operating on shoes the combination with means for positioning the forepart of a shoe, of means for acting upon the rear part of the shoe constructed and arranged to permit of lateral adjustment, and mechanism for automatically making such lateral adjustment first toward one side of the machine and then toward the other side for adapting the machine to operate alternately on a shoe on a right last and then on a shoe on a left last.

56. In a machine for operating on shoes the combination with mechanism for inserting tacks at the toe end of a shoe, means for positioning the shoe during the tacking operation, and means operating auto-

matically to adjust the toe tacking mechanism and the shoe positioning means relatively between successive tacking operations to adapt the machine for use alternately upon a right crooked last and then upon a left crooked last.

57. A machine of the class described having, in combination, mechanism adapted to perform the same operation with appropriate differences on one end of right and left shoes, said mechanism including heel engaging means, and means for automatically shifting said heel engaging means laterally toward one side of the machine for operating on the shoe for one foot and laterally toward the other side of the machine for operating on the shoe for the other foot.

58. A machine of the class described having, in combination, means for operating on shoes, an automatically reciprocating slide, an adjuster for said mechanism, and connections between said slide and adjuster arranged to produce a predetermined movement of the adjuster during movement of the slide in one direction and during return movement of the slide a resetting of said connections to cause them to produce a reverse movement of the adjuster in the next forward movement of the slide.

59. A machine of the class described having, in combination, means for operating on shoes, an automatically reciprocating slide, an adjusting lever for said mechanism, two arms moved by said slide and arranged to engage said lever, a star wheel arranged to hold one of said arms out of such engagement, and a pawl to turn the star wheel at each complete reciprocation of the slide to allow said arms ao engage the adjusting lever alternately.

60. A machine of the class described having, in combination, means for operating on shoes, an automatically reciprocating slide, an adjusting lever for said mechanism, two arms moved by said slide and arranged to engage said lever, a star wheel arranged to hold one of said arms out of such engagement, a pawl to turn the star wheel at each complete reciprocation of the slide to allow said arms to engage the adjusting lever alternately, and means so to position the pawl that it will turn the star wheel into position to hold both arms out of operative engagement with the adjusting lever and leave the star wheel in that position during repeated reciprocations of the slide.

61. A machine of the class described having, in combination, means for pulling-over a shoe and fastening the upper, mechanism for adjusting said means to operate with appropriate differences on right and left shoes, said machine including an automatically reciprocated slide, said mechanism including an adjusting lever, two arms moved by said slide and arranged to engage said lever, a star wheel arranged to hold one of said arms out of such engagement, and a pawl to turn the star wheel at each complete reciprocation of the slide to allow said arms to engage the adjusting lever alternately.

62. In a machine for pulling-over shoes on right and left crooked lasts, the combination with upper pulling mechanism comprising grippers at each side arranged to seize the forepart of an upper at each side of a last and stretch the upper and operating mechanism for the grippers, of means conveniently accessible to an operator standing in working position to effect an adjustment of the upper pulling mechanism prior to the pulling operation to adapt it for pulling-over a right shoe or a reverse adjustment to adapt it for pulling-over a left shoe.

63. A pulling-over machine having, in combination, upper pulling means and fastening means comprising devices arranged to act at the toe end and at opposite sides of a shoe, and operating mechanism constructed and arranged to effect automatically alternate adjustments of the position of a fastening device suited respectively to fastening the upper of right and left shoes on crooked lasts.

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

RONALD F. McFEELY.

Witnesses:

BARTHOLOMEW T. McDONOUGH,

NORMAN C. HUSSEY.

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