

E. E. WINKLEY.
LASTING MACHINE.
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3 SHEETS—SHEET 1.

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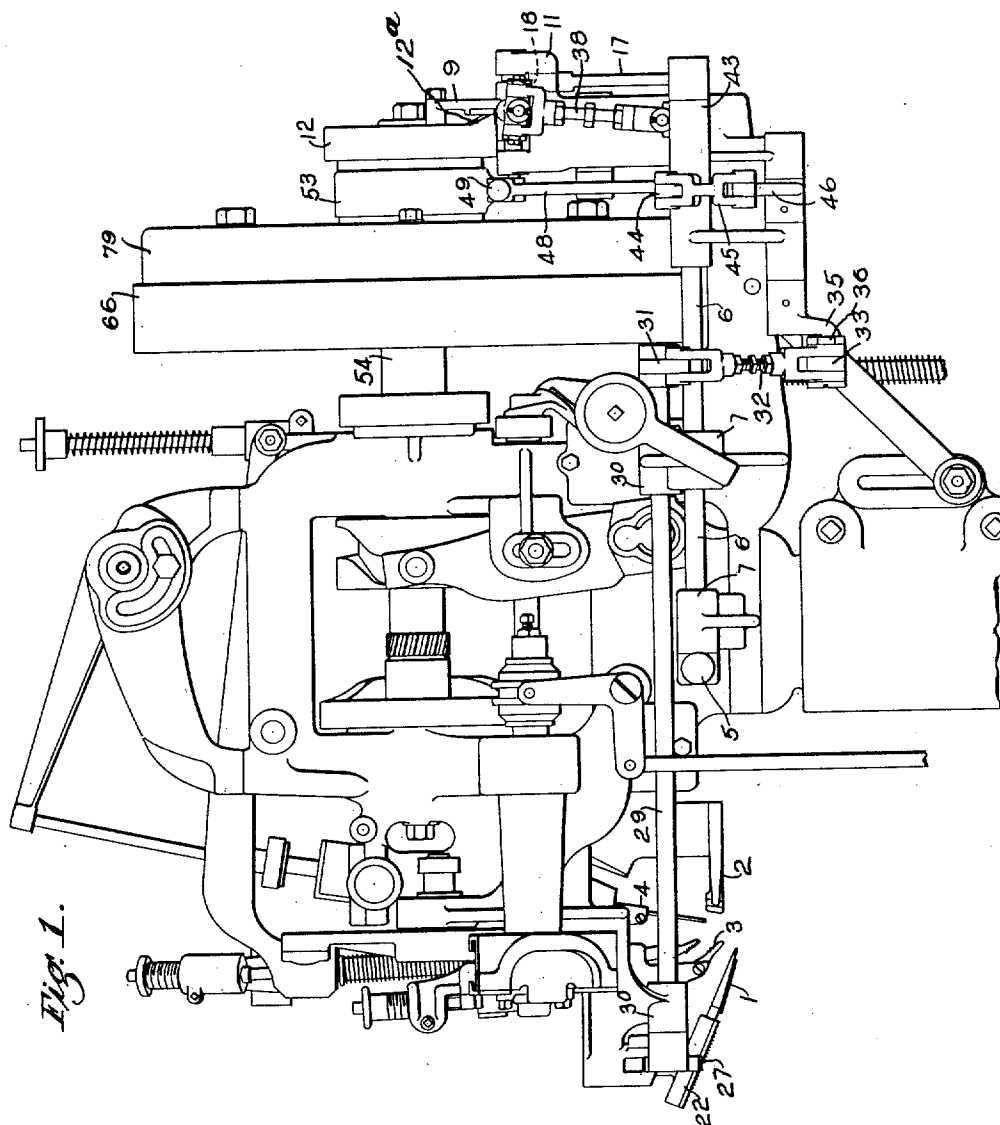


Fig. 1.

Witnesses:

Roswell F. Hatch.

Burton W. Cary

Inventor

Erastus E. Winkley

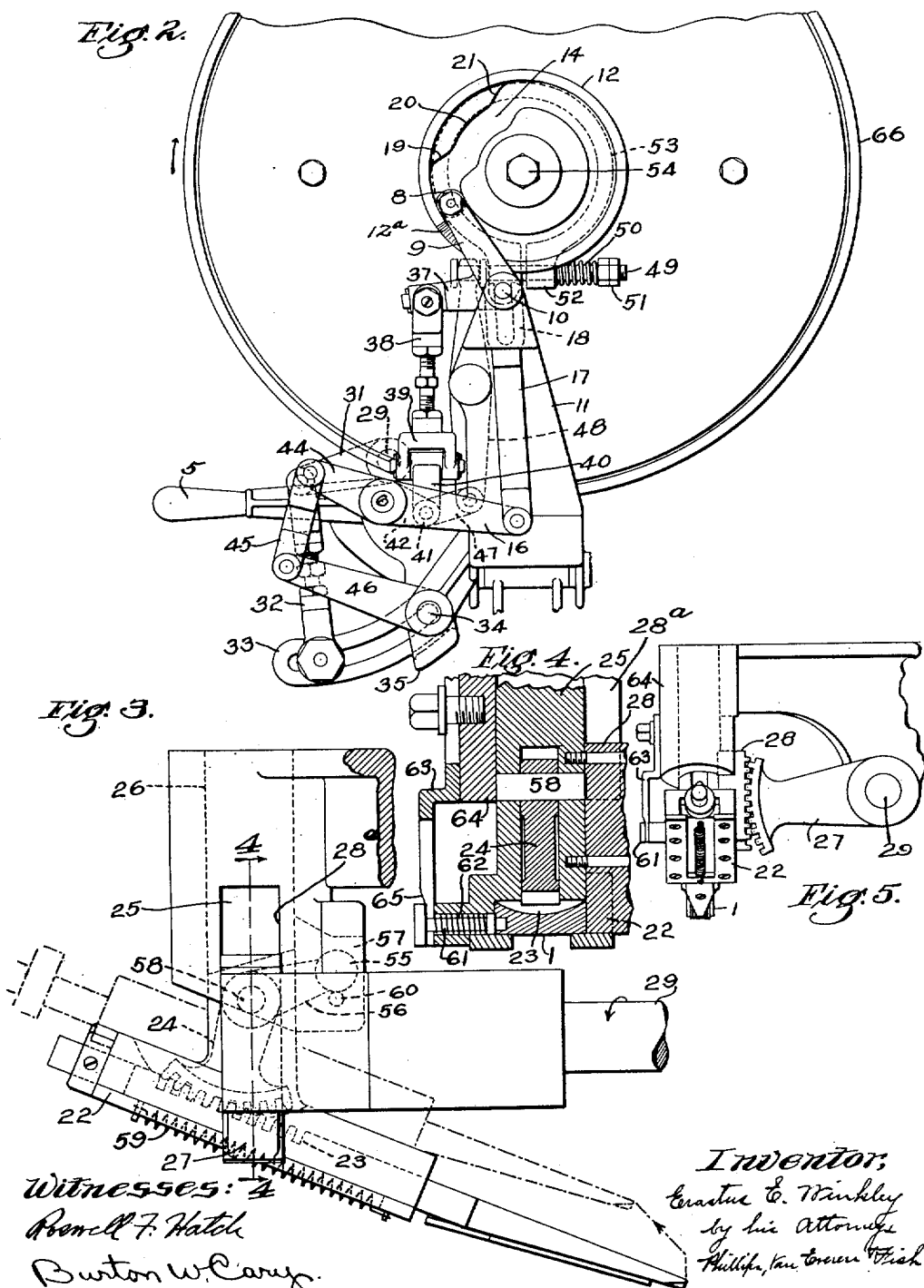
by his Attorneys

Phillips, Van Orman & Fish.

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3 SHEETS—SHEET 2.

1,057,606.



Witnesses:
Ronell F. Hatch
Burton W. Carey.

Inventor:
Erastus E. Winkley
by his Attorneys
Phillips, Van Dusen & Fish

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3 SHEETS—SHEET 3.

Fig. 7

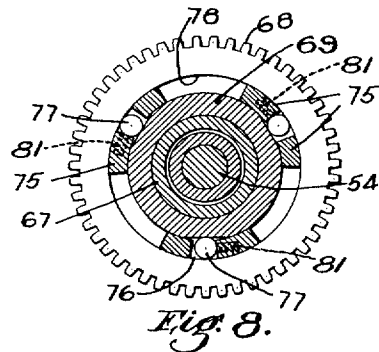
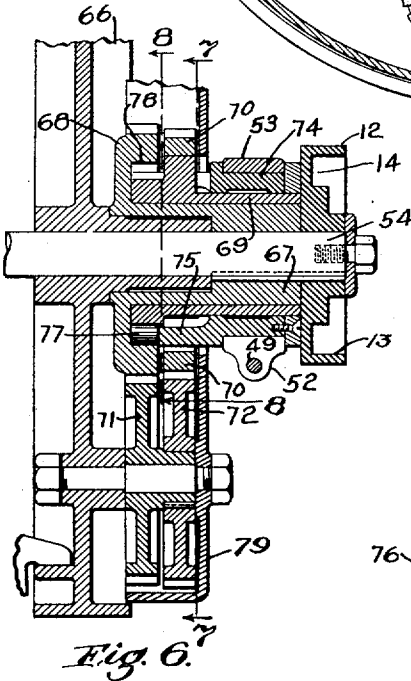
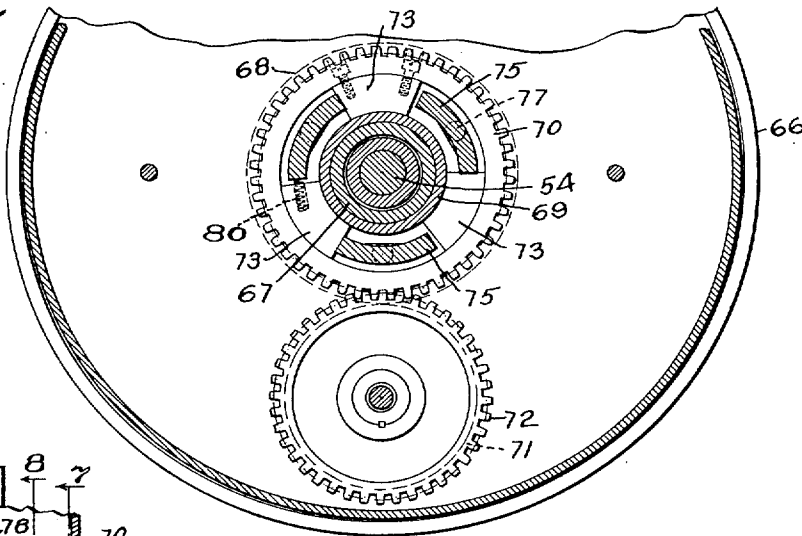
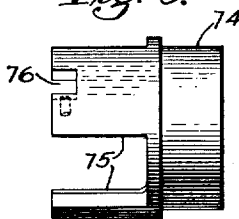


Fig. 9.



Witnesses:
Rommel F. Hatch
Burton W. Cary.

Inventor
Erastus E. Winkley
by his Attorneys,
Phillips, Van Orman & Smith

UNITED STATES PATENT OFFICE.

ERASTUS E. WINKLEY, OF LYNN, MASSACHUSETTS.

LASTING-MACHINE.

1,057,606.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed August 8, 1910. Serial No. 576,038.

To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, 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 Lasting-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 certain new and useful improvements in lasting machines and more particularly to that type of lasting machines commonly known as the hand method lasting machine.

It is desirable in lasting the better grade of shoes and in lasting shoes in which the pulling over operation has been inefficiently performed, for the operator, in order to properly last the shank, to perform this step in the operation by hand. A spindle is commonly provided upon the bench at one side of the machine and prior to lasting one side of the shoe the operator will spindle the last, seize the margin of the upper with hand lasting pincers, at a point about opposite the ball of the last, and will then draw on the upper with a slow steady pull in a direction toward the heel and across the instep, such a pull being necessary to properly draw the upper at the instep to the wood. The upper at this point is generally slack and stands out from the body of the last owing to the sharp inward curvature of the last at the shank and a sharp quick pull which is sufficient to properly draw over the upper at the ball of the last, would not effectually draw over the upper at this point. After having thus stretched the upper and drawn it to the wood it is held tightly in place by the operator until the first tack has been driven by the machine at about the ball of the last. After one side of the shoe has been lasted, the last is again spindled, the margin of the upper at the opposite side of the ball of the shoe is seized by hand pincers at the instep and the upper is drawn to the wood by stretching it over that side of the last. A tack is driven at this point and the remainder of the upper upon this side of the shoe is then lasted as before.

The principal object of the present invention is to enable the upper to be evenly and tightly drawn to the body of the last at the shank portion by mechanical means.

With this end in view one feature of the invention comprises mechanism for giving a slow upward and overdraw movement to the pincers after the upper has been grasped at the shank portion.

A further object of the invention is to provide means which will enable the pincers of the lasting machine to properly grasp the margin of the upper and draw the upper over at the shank portion of the last when operating upon shoes in which the edge of the upper at the shank of the shoe either does not extend upwardly to the level of the bottom of the last or in which the upper stands out from the body of the last at the shank portion.

With this object in view a further feature of the invention contemplates the provision of a movable bottom rest for the last with mechanism for automatically moving the bottom rest when the shank portion of the upper is to be drawn over into a position where the upper of the shoe may be grasped by the pincers at a point farther removed from the sole than is possible when operating upon other portions of the shoe.

Still further features of the invention will be more fully described in the accompanying specification and defined in the appended claims.

In the accompanying drawings illustrating the preferred form of the invention, Figure 1 represents a side elevation of a lasting machine with the present invention applied thereto; Fig. 2 represents a right-hand elevation of the machine shown in Fig. 1, with the upper portion of the driving pulley broken away, and illustrating the mechanism for moving the work support and for securing a slow movement of the pincers; Fig. 3 is a detail of the operating mechanism for the work support; Fig. 4 is a section upon the line 4—4 of Fig. 3; Fig. 5 is an end elevation of the work support shown in Fig. 3; Fig. 6 is a longitudinal section through the main driving pulley and shaft illustrating the mechanism for securing a slow movement of the pincers; Fig. 7 is a section upon the line 7—7 of Fig. 6; Fig. 8 is a sectional view taken from the line 8—8 of Fig. 6 and showing a detail of the clutch which is employed; and Fig. 9 is a detail showing the cage or retaining ring employed for holding the rolls of the clutch in place.

The present invention is preferably illustrated in connection with a machine of the

type shown and described in United States Letters Patent to S. W. Ladd, No. 597,321, dated January 11, 1898, but it is to be understood that the device which is the subject of the present invention is capable of general application upon various types of hand method lasting machine, and it is not to be considered as limited in its use to the particular type of lasting machine shown in the drawings. The shoe is operated upon in this type of machine by holding the last bottom upward against the bottom rest 1. The margin of the upper of the shoe is then grasped by a pair of movable pincers 3, which, after securing a firm hold on the upper, are moved first upward and then inward toward the center line of the sole to draw it uniformly and evenly to the body of the last. The upper is then held in this position of the pincers while the tacker mechanism 4 drives a tack through the upper and secures it in position at this point, the tack being held by a tack block 2. This mode of operation is old and well known in the art, as may be seen from an inspection of the patent to S. W. Ladd hereinbefore referred to, and forms no part of the present invention. In all previous hand method lasting machines, however, in order that the upper may be properly drawn to the wood across the instep, it has been necessary, when lasting the shank of a shoe, to spindle the last and to perform this portion of the operation with care by hand. This is due to the fact that the pincers, in order to properly draw the upper to the body of the last at the start, must have a slower relative overdrawing movement than is provided by the ordinary pincer operating mechanism or than is needed in lasting the upper at the forepart of the shoe.

In the present machine mechanism is provided for giving a relatively slow movement to the pincers when drawing over the upper of the shoe at the shank, as it is found that this slow movement draws the upper to the wood more tightly and evenly than would be possible with the quick movement of the pincers which is employed in drawing over the forepart of the shoe.

In some cases when the shoe comes to the lasting machine the upper is slack at the shank and therefore the margin of the upper does not project beyond the plane of the sole as it should. In other cases, the upper stands out from the body of the last at the shank owing to improper pulling over and other causes well known to those skilled in the art. In either of these or similar cases when the shoe comes from the puller-over with the upper improperly positioned at the shank, it is necessary to provide the machine with some auxiliary means which will enable the pincers to properly seize the margin of the upper at this point as the pincers

ordinarily would not have the requisite movement necessary to reach the upper if the shoe were held in its normal position. In order to overcome this difficulty an auxiliary mechanism has been provided for moving the usual bottom rest upward to enable the shoe to be raised to a position where the margin of the upper may be seized properly by the pincers. The mechanism for moving the bottom rest operates preferably in conjunction with the mechanism for giving a slow movement to the pincers but these mechanisms may be disconnected and allow the bottom rest to be held continuously in a stationary position when so desired.

It is not desired, of course, to affect the normal speed and operation of the lasting machine during the lasting of the ball and toe of the shoe, and to this end of the mechanism for securing a slow movement of the pincers and operating the bottom rest is conveniently thrown into operation by a hand lever 5 which is attached to one end of a rock shaft 6 mounted in brackets 7 upon the frame of the machine. The rock shaft 6 upon being oscillated slides the cam roll 8 and arm 9 mounted upon the shaft 10 longitudinally in the supporting bracket 11. The cam roll 8 engages with a plate cam 12, but it will be noted that the cam 12 comprises an outer circular surface 13 and an inner cam path 14. The cam roll, in the normal operation of the machine, ordinarily travels in contact with the outer surface 13 and no movement downward is imparted thereto, but upon movement of the hand lever 5 by the operator the cam roll 8 is moved inwardly and engages with the cam path 14. The mechanism by which motion is transmitted from the rock shaft 6 to the shaft 10 to move the same longitudinally conveniently comprises an arm 16 sleeved to the outer end of the rock shaft and locked against rotation relatively thereto, and a forked lever 17 pivotally connected to the free end of the arm 16 and having its forked end embracing the shaft 10 and bearing against the hub of the arm 9. In order that a vertical movement of the forked lever 17 shall move the arm 9 and shaft 10 longitudinally, the lever 17 is provided with wedge-shaped surfaces 18, shown in Fig. 1, upon the face of the lever contacting with the arm 9.

The preferred form of the path cam is one similar to that illustrated, in which the cam produces an initial movement of the various mechanisms by engagement of the cam roll with the inclined portion 21 of the cam path, the cam path being next provided with a dwell 20 during which the parts are held in the position to which they have initially moved, the cam roll being then returned to its original position by the por-

tion 19 of the cam path, restoring the mechanisms to their normal position. The movement of the cam roll by the cam accomplishes two distinct results. Upon engagement of the cam roll 8 with the portion 21 of the cam path, the bottom rest 1 is moved upwardly and over a certain predetermined amount, and at the same time the driving mechanism for moving the pincers is automatically regulated to secure a slow movement of the pincers. While the cam roll 8 travels through the portion 20 of the cam path, the bottom rest 1 is held in its raised position and the pincers 3, having grasped the upper, are retracted with a slow movement. Simultaneously with the pincers reaching the limit of their upward movement the cam roll engages with the portion 19 of the cam path, and the bottom rest 1 is moved down and back to its normal position, securing a further drawing over of the upper of the shoe, at the same time the slow speed is automatically thrown out.

It is considered desirable to automatically return the cam roll 8 to its normal position in contact with the surface 13 of the cam 12, and to this end a projection 12^a is formed upon the edge of the cam 12 contacting with arm 9 and moving it outwardly upon engagement therewith. With this arrangement the mechanism for securing a slow movement of the pincers will only be operative during one revolution of the driving shaft 54 unless the operator again moves the hand lever 5. It will be understood that the wedge 18 has been lowered before the completion of this revolution, as the weight of the parts at the other side of the shaft 6, from the handle 5, is sufficient to cause the wedge to drop on the release of the handle by the operator. The bottom rest 1 is slidably mounted for longitudinal movement in a box 22 and is provided upon its upper face with a toothed rack 23 which engages with an oscillatory toothed segment 24. The bottom rest 1 and supporting box 22 are mounted upon a cross-head 25, which slides in vertical ways 26 in the frame. A vertical movement is given to the cross-head 25 by engagement of an oscillatory toothed segment 27 with a toothed rack 28 formed upon a projecting face of the cross-head. The frame is slotted at 28^a and the rack projects therethrough to prevent twisting movement of the cross-head. The segment 27 is fixedly mounted upon a rock shaft 29 which is mounted in brackets 30 secured to the frame of the machine. The rock shaft 29 is operated upon movement of the cam roll 8 through a train of mechanism comprising an arm 31 fixed upon the outer end of the rock shaft 29 and having a link 32 pivotally connected to its free end. The link 32 is pivotally connected at its lower end to a slotted segment 33 which is

fixed upon one end of a shaft 34. In order that the oscillatory movement of the shaft 29 may be varied, and, if so desired, may be entirely discontinued, the curved segment 33 is attached to the shaft 34 by means of a yoke 35, and the link 32 is adjustably secured to the segment 33 by a bolt and nut 36. The yoke connection 35 enables the lower portion of the link 32 to be secured in the segment 33 at a point coincident with the axis about which the segment 33 oscillates, so that, when so secured, upon oscillation of the segment no resultant movement will be communicated to the link 32 and rock shaft 29. The value of this feature will be appreciated when it is considered that in operating upon many kinds of shoes it is only desired to secure the slow movement of the pincers and not the additional movement of the bottom rest which can be easily retained in locked position and hold the last stationary while the upper is being operated upon by the pincers. The rock shaft 34 is oscillated upon movement of the arm 9 through a system of linkages comprising an arm 37 mounted upon the hub of the arm 9 and movable therewith. The arm 37 has a link 38 connected to its free end and the link 38 is connected through a universal joint 39 and a short rod 40 with the pivotal point 41 of a toggle. The arm 42 of the toggle is formed integrally with a sleeve 43 which is loosely supported upon the shaft 6. The sleeve 43 has an arm 44 fixed thereto and extending from the side opposite the arm 42. The arm 44 oscillates the shaft 34 through a link 45 connected to its free end and the arm 46 which is fixed to the shaft 34. The opposite arm 47 of the toggle is connected at its free end to a lever 48 pivoted at its central point on the frame of the machine and engaging at its upper end the head of a bolt 49 which is normally held inward by a coiled spring 50 bearing against a nut 51 at one end and bearing at its opposite end against a projecting lug 52 formed upon the band 53 of a friction brake mounted upon the main driving shaft 54 of the machine. A movement of the cam roll 8 and arm 9 will thus operate through the toggle to oscillate the shaft 29 and move the bottom rest 1 upwardly, and will at the same time rock the lever 48 about its pivotal point, moving the upper end outwardly, compressing the spring 50 to tighten the brake band 53 and apply the friction brake. The movement of the rest 1 due to the oscillation of the shaft 29 will continue in a vertical direction until the free end 55 of an arm 56 contacts with the upper wall of the recess 57 into which the arm 56 projects. When the end of the arm 56 is stopped from further movement in a vertical direction, the continued upward movement of the cross-head 25 will result in oscillating the

toothed segment 24 which is fixed to the arm 56 and pivotally mounted at 58 in the cross-head 25.

The oscillation of the segment 24 will withdraw the rest 1 in the box 22 against the action of the spring 59 which is fastened at one end to the box and at the other end to a portion of the rest 1. Upon the oscillation of the shaft 29 in the reverse direction the spring 59 will retain the free end of the arm 56 against the upper wall of the recess 57 until the rest has been forced out of the box 22 to its normal position when the movement of the rest will be vertically downward. As it is necessary for the bottom rest to be returned to its original or normal position in order that the tack may be properly driven, a pin 60 is mounted in the frame of the machine extending into the recess 57 and positioned to contact with the lower edge of the arm 56 in order that the rest 1 shall be positively forced over into its proper position before the tack is driven into the last. It will now be seen that in addition to the upward and overdraw movement of the pincers, there is also the movement of the bottom rest back to its normal position, which is the reverse of the upward movement of the pincers, so that the result is an increased drawing over of the upper at this point. The pincers are yieldably mounted so that when the strain upon the upper due to the downward movement of the bottom rest exceeds a certain amount the pincers will yield and not tear the upper. In order that the rest shall be locked and held rigidly in place during the tack-driving operation, a spring-pressed pin 61 is provided, the end of which projects into a hole in the side face of the rest 1 when in its normal position. The pin 61 is mounted in a slot in the frame of the machine, and is normally forced inward by a coiled spring 62. In order that the bottom rest may be released upon its upward movement, a vertical forked finger 63 is bolted to the side of the cross-head slide 64, and has a wedge-shaped lower end 65 engaging with the head of the pin 61, so that upon upward movement of the rest 1, the wedge 65 engaging with the head of the pin 61 will force the pin outwardly and release the work support, allowing it to be withdrawn.

The slow movement of the pincers 3 is secured upon tightening the brake band 53, and it will be seen that this is coincident with the upward movement of the rest 1 and that the slow movement will continue during the time that the rest is maintained in its raised position. Under normal conditions the drive shaft 54 will be driven directly from the drive pulley 66 when the brake band 53 is loose. A sleeve 67 is keyed to the shaft 54 and has a gear 68 formed integrally upon one end thereof. A second sleeve 69

is mounted loosely upon the sleeve 67 and has a gear 70 fastened thereto. The gears 68 and 70 mesh respectively with gears 71 and 72, keyed together and rotatably mounted upon a radial arm of the drive pulley 66. The gears 71 and 72 have a different number of teeth and will tend to drive the gears 68 and 70 respectively at different speeds. The sleeve 69 has a series of radial projecting arms 73 upon the outer ends of which is fastened the gear 70. These arms 73 of the sleeve 69 form a portion of what is commonly known as a "Horton" clutch, and a cage or retaining ring 74 is loosely supported upon the sleeve 69 and provided with a series of longitudinally projecting arms 75 which project between the arms 73 of the sleeve 69. The portions of the sleeve 69 between the arms 73 and projecting beyond the same are slightly flattened, as shown clearly in Figs. 7 and 8. The arms 75 of the retaining ring 74 are provided with recesses 76, in which are held balls or rolls 77. As the driving pulleys 66 and gears 71 and 72 are revolved, the gears 68 and 70 will tend to revolve at different speeds, the gear 70 rotating faster than the gear 68, and as the brake band 53 is normally loose, the retaining ring 74 will be allowed to rotate freely and the arms 75 of the retaining ring 74 will be moved by the radial arms 73 relatively to the gear 68, wedging the balls 77 between the surface of the sleeve 69 and the inner flanged portion 78 of the gear 68 locking the two gears 68 and 70 against rotation relatively to one another. It is preferred, in order to secure a more positive action of the clutch, to employ two sets of springs 80—81 which bear against the arm 75 of the ring 74 and the balls 77 respectively, and tend to normally lock the clutch. Owing to the fact that the gears 71 and 72 will tend to rotate the gears 68 and 70 at different speeds, the shaft 54 will be driven directly from the pulley 66 as soon as the gears 68 and 70 are locked to one another, in the same manner as if the pulley 66 were keyed directly to the shaft 54. When the brake band 53 is tightened, however, the retaining ring 74 and the gear 70 will be held against rotation and will prevent the balls 77 of the clutch from becoming wedged into place and locking the gears 68 and 70 together. Then, as the gear 70 is held stationary, a slow rotation will be imparted to the gear 68 to rotate the shaft 54 which is the result of the differential movement between the gears 71 and 72. In order that the gears may be properly inclosed from dust, and the operator protected from injury by the gearing, a shield 79 is fastened to the drive pulley and covers the various gears.

While the particulars described are well suited to one mechanical form of the invention, it is not to be understood that these

particulars are essential, since they may be variously modified within the skill of the artisan without departing from the true scope of the actual invention, as defined by the claims.

What is claimed as new, is—

1. A lasting machine, having, in combination, a bottom rest for the last, tack driving mechanism, pincers operating to draw over the upper of the shoe and hold it in this position preliminarily to the operation of the tack driving mechanism, and mechanism under control of the operator for automatically moving the bottom rest to enable the pincers to properly grasp the upper and for simultaneously giving a relatively slow movement to the pincers whereby the upper is evenly and uniformly drawn to the last at the shank, substantially as described.

2. A lasting machine, having, in combination, a bottom rest for the last, tack driving mechanism, pincers operating to draw over the upper of the shoe and hold it in this position preliminary to the operation of the tack driving mechanism, and mechanism under control of the operator automatically giving an upward movement to the bottom rest in order to allow the upper to be better grasped by the pincers, for simultaneously securing a slow upward and overdraw movement of the pincers and for finally giving a slow downward movement to the bottom rest to return it to the original position, whereby the upper is drawn closely to the body of the last at the shank portion, substantially as described.

3. A lasting machine, having, in combination, a movable bottom rest for the last, tack driving mechanism, pincers operating to draw over the upper of the shoe preliminarily to the operation of the tack driving mechanism, and mechanism for automatically controlling the movements of the bottom rest and pincers in order to secure a better stretching of the upper at the shank portion of the shoe, comprising a continuously rotating cam, a cam roll mounted adjacent thereto but in normally inoperative relation to the cam, and means accessible to the operator for moving the cam roll into operative relation with the cam when so desired, whereby the controlling mechanism for the pincers and bottom rest is operated, substantially as described.

4. A lasting machine, comprising a bottom rest for the last, means for automatically moving the bottom rest comprising a continuously rotating cam, a cam roll normally in inoperative relation thereto, a rock shaft journaled in the machine and oscillated upon movement of the cam roll by the cam, and connections between the rock shaft and bottom rest adapted to move the bottom rest in a vertical direction upon oscillation of the rock shaft, and means under control

of the operator for engaging the cam roll with the cam, substantially as described.

5. A lasting machine comprising a bottom rest for the last, a cross head supporting the rest and means under control of the operator for automatically moving the bottom rest comprising a continuously rotating cam, and operative connections between the cam and bottom rest adapted to first move the bottom rest in a vertical direction and to withdraw the bottom rest longitudinally upon the continuation of the vertical movement of the cross-head beyond a certain predetermined point, substantially as described.

6. A lasting machine comprising a bottom rest for the last and means under control of the operator for automatically moving the bottom rest comprising a continuously rotating cam, a cam roll in operative relation thereto, a rock shaft adapted to be oscillated upon movement of the cam roll, a cross-head mounted to slide vertically in the frame of the machine, the bottom rest being mounted to slide longitudinally in the lower portion of the cross-head, a bell crank lever pivotally mounted in the cross-head and having one arm operatively connected with the bottom rest, the other arm of the bell crank projecting into a recess adjacent to the cross-head, the free arm of the bell crank being adapted to contact with the upper wall of the recess to withdraw the bottom rest longitudinally in the cross-head upon upward movement of the cross-head beyond a certain predetermined point, whereby the bottom rest is given an upward and overdraw movement, substantially as described.

7. A lasting machine comprising a movable bottom rest for the last, movable pincers operating to draw over the upper of the shoe, means under control of the operator for automatically moving the bottom rest comprising a continuously rotating cam, a cam roll in operative relation thereto, and mechanism connecting the cam roll and bottom rest and adapted to move the bottom rest upon movement of the cam roll, the cam adapted to give an initial upward movement to the bottom rest and to give a return downward movement to the bottom rest with an intervening interval during which the bottom rest is held in the raised position while the upper of the shoe is grasped by the pincers and drawn over upon the retracting of the same, substantially as described.

8. A lasting machine comprising a movable bottom rest for the last, movable pincers operating to draw over the upper of the shoe, means under control of the operator for automatically moving the bottom rest comprising a continuously rotating cam, a cam roll in operative relation thereto, mechanism connecting the cam roll and bottom rest and adapted to move the bottom rest upon movement of the cam roll, the cam

adapted to give an initial upward movement to the bottom rest and to give a return downward movement to the bottom rest, and means adapted to move the bottom rest longitudinally upon continued vertical movement of the bottom rest in either direction beyond certain predetermined limits, substantially as described.

9. A lasting machine comprising a movable bottom rest for the last, mechanism for automatically moving the bottom rest in a certain predetermined path and for returning it to its initial position in the same path, comprising a vertically movable cross-head supporting the bottom rest, a bell crank lever pivotally mounted in the cross-head and having one arm operatively connected with the bottom rest to move the same longitudinally, the free arm of the bell crank projecting into a recess in the frame adjacent the cross-head, a pin projecting into the recess below the free arm of the bell crank, and means for sliding the cross-head vertically in the frame and for returning it to its original position, the upper wall of the recess adapted to contact with the free arm of the bell crank upon a predetermined movement of the cross-head in an upward direction and withdraw the bottom rest longitudinally upon further upward movement of the cross-head, the pin adapted to contact with the free arm of the bell crank upon downward movement of the cross-head and positively force the bottom rest back to the original position, substantially as described.

10. A lasting machine comprising a normally stationary bottom rest, means for moving the bottom rest upwardly, means for locking the bottom rest in fixed position but adapted to be automatically disengaged upon upward movement of the bottom rest, the locking means comprising a spring-pressed pin normally engaging one face of the bottom rest to lock the same in position and an arm mounted upon the frame of the machine having a wedge-shaped surface adapted to contact with a portion of the spring-pressed pin and move it outwardly to disengage the pin from the bottom rest upon upward movement of the bottom rest, substantially as described.

11. A lasting machine having, in combination, a bottom rest for the last, tack driving mechanism, pincers operating to draw over the upper of the shoe preliminarily to the operation of the tack driving mechanism, and means under control of the operator for automatically moving the bottom rest and for simultaneously securing a relatively slow movement of the pincers, the said means adapted to be rendered inoperative in respect to the bottom rest, substantially as described.

12. A lasting machine, having, in combination, a bottom rest for the last, tack driv-

ing mechanism, pincers operating to draw over the upper of the shoe preliminarily to the operation of the tack driving mechanism, and means under control of the operator for automatically moving the bottom rest and for simultaneously securing a relatively slow movement of the pincers, the said means comprising a rock shaft, a segment rigidly fastened thereto and a link adjustably fastened to the segment at one end and operatively connected with the bottom rest at the other end, the connection between the segment and rock shaft adapted to allow the end of the link to be adjusted upon the segment to a point coincident with the axis of the rock shaft, whereby no movement will be communicated to the bottom rest upon oscillation of the rock shaft, substantially as described.

13. A lasting machine, comprising movable pincers operating to draw over the upper of the shoe, and mechanism under control of the operator for varying the speed of movement of the pincers comprising a brake, means to automatically govern the application of the brake, a main driving pulley, a shaft upon which the pulley is loosely mounted, and means adapted to rotate the shaft at the same speed as the driving pulley when the brake is loose and to rotate the shaft at a speed relatively slower than the driving pulley when the brake is tightened, substantially as described.

14. A lasting machine comprising movable pincers operating to draw over the upper, means for varying the speed of movement of the pincers comprising a main drive shaft, a drive pulley loosely mounted thereon, a pair of gears mounted upon a radial arm of the drive pulley and locked against rotation relatively to one another, the gears having a different number of teeth and meshing respectively with two other gears mounted upon the drive shaft, one of the last-mentioned gears being keyed to the drive shaft, a brake upon the drive shaft, and means controlled by the brake for locking the two last mentioned gears against rotation relatively to one another, whereby the driving shaft is rotated at the same speed with the drive pulley, substantially as described.

15. A lasting machine having, in combination, pincers, pincer operating mechanism for imparting a lasting movement to the pincers, means for changing the speed of operation, and automatic means for restoring the normal speed of operation after a single lasting movement, substantially as described.

16. A lasting machine having, in combination, pincers, mechanism for imparting lasting movements to said pincers, and means for changing the speed of operation of said pincers, arranged to automatically

restore their normal speed of operation, during any single lasting movement at the will of the operator, substantially as described.

17. A lasting machine comprising a bottom rest, mechanism for moving the bottom rest at predetermined intervals, means for locking the bottom rest when in its depressed position, and means for rendering the locking means inoperative when the rest

10 is raised, substantially as described.
18. A lasting machine, having, in combination, pincers, pincer operating mechanism for imparting a lasting movement to the pincers, means, under the control of the
15 operator, for changing the speed of operation of the pincers, and means operated wholly by the machine for maintaining the changed speed for a predetermined time and then restoring the former speed of operation, substantially as described.

20 19. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting a lasting movement thereto, a bottom rest below the pincers to position
25 the shoe for the operation of the pincers, and means under control of the operator which, after actuation by him, causes the machine to relatively move the bottom rest and pincers vertically to bring them nearer
30 together prior to the lasting movement of the pincers, substantially as described.

20. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting a lasting movement thereto,
35 a bottom rest below the pincers to position the shoe for the operation of the pincers, and means under control of the operator which, after actuation by him, causes the machine to raise the bottom rest to permit
40 the shoe to be positioned nearer to the pincers, substantially as described.

21. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting a lasting movement thereto,
45 a bottom rest below the pincers to position the shoe for the operation of the pincers, a supporting box at an acute angle to the horizontal in which the bottom rest is slidingly mounted, and means under control of the
50 operator which after actuation by him causes the machine to slide the bottom rest outwardly within its box, substantially as described.

22. A lasting machine, having, in combination, pincers and operating means therefor, a bottom rest below the pincers to position the shoe for the operation of the pincers, and mechanism operated by the machine for moving the bottom rest both upwardly and outwardly relative to the pincers, substantially as described.

23. A lasting machine, having, in combination, pincers and operating means therefor, a bottom rest below the pincers to position the shoe for the operation of the pin-

cers, and a single connected mechanism for moving the bottom rest first upwardly toward the pincers and then outwardly away from the pincers, substantially as described.

24. A lasting machine, having, in combination, pincers and operating means therefor, a bottom rest below the pincers to position the shoe for the operation of the pincers, and means under control of the operator which, after actuation by him, causes
70 the bottom rest to be automatically moved upwardly and outwardly relative to the pincers, substantially as described.

25. A lasting machine, having, in combination, pincers and operating means therefor, a bottom rest below the pincers to position the shoe for the operation of the pincers, mechanism operated by the machine for moving the bottom rest both upwardly and outwardly relative to the pincers, and provision for varying the extent of the movements imparted to the bottom rest, substantially as described.

26. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting movement to the pincers, a bottom rest below the pincers to position the shoe for the operation of the pincers, movable toward and from the pincers, mechanism for giving
95 a relatively slow lasting movement to the pincers, mechanism for moving the bottom rest toward the pincers, and means connecting said mechanisms for operating them simultaneously, substantially as described.

27. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting movement to the pincers, a bottom rest below the pincers to position the shoe for the operation of the pincers, movable toward and from the pincers, mechanism for giving
105 a relatively slow lasting movement to the pincers, mechanism for moving the bottom rest toward the pincers, means connecting said mechanisms for operating them simultaneously, and provision for rendering said bottom rest moving mechanism inoperative at the will of the operator, substantially as described.

28. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting movement to the pincers, a bottom rest below the pincers to position the shoe for the operation of the pincers, movable toward and from the pincers, and a single connected mechanism for simultaneously giving a relatively slow lasting movement to the pincers and for moving the bottom rest vertically to bring it nearer to the pincers, substantially as described.

29. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting

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movement to the pincers, means under control of the operator which, after actuation by him, causes said pincer operating means to impart a relatively slow lasting movement to the pincers, and means for automatically restoring the quick movement to the pincers after a single lasting movement, substantially as described.

30. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting movement to the pincers, and mechanism arranged to be connected by the operator before the commencement of the lasting operation and thereafter wholly operated and controlled by the machine for imparting a relatively slow lasting movement to the pincers for the initial lasting movement only, substantially as described.

31. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting movement to the pincers, mechanism for imparting a relatively slow lasting movement to the pincers, a manually controllable device for actuating said mechanism, and a cam for disconnecting said mechanism after a single lasting movement, substantially as described.

32. A lasting machine, having, in combination, pincer operating mechanism for imparting a lasting movement to the pincers, a change-speed mechanism constructed and arranged to change the speed of operation of the pincers at a predetermined point in the cycle of operations, and means for controlling the operation of said change speed mechanism, substantially as described.

33. A lasting machine, having, in combination, pincer operating mechanism for imparting a lasting movement to the pincers, a change-speed mechanism constructed and arranged to change the speed of operation of the pincers at the commencement of a cycle of operations and to thereafter restore the former speed of operation at the completion

of the same cycle of operations, and means for controlling the operation of said change-speed mechanism, substantially as described.

34. A lasting machine, having, in combination, pincer operating mechanism for imparting a lasting movement to the pincers, and mechanism arranged to be connected by the operator for causing the machine to impart a lasting movement to the pincers at a different speed, said mechanism being constructed and arranged to cause the change in speed to invariably occur at the same point in the cycle of operations irrespective of the time at which the connection is made by the operator, substantially as described.

35. A lasting machine, having, in combination, pincer operating mechanism for imparting a lasting movement to the pincers, mechanism constructed and arranged to change the speed of operation to the pincers at a predetermined point in the cycle of operations and to thereafter restore the former speed of operation, and means under control of the operator for actuating said change-speed mechanism, substantially as described.

36. A lasting machine, having, in combination, pincers, pincer operating mechanism for imparting a lasting movement to the pincers, a change-speed mechanism constructed and arranged to change the speed of operation of the pincers, means, including a cam, for operating the speed changing mechanism to reduce the speed of operation for a predetermined period and then restore the former speed, a device under control of the operator for placing the speed changing mechanism under control of said cam means, and automatic means for disconnecting said device after the completion of the period of operation at the reduced speed, substantially as described.

ERASTUS E. WINKLEY.

Witnesses:

BURTON W. CARY,
WARREN G. OGDEN.

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

It is hereby certified that in Letters Patent No. 1,057,606, granted April 1, 1913, upon the application of Erastus E. Winkley, of Lynn, Massachusetts, for an improvement in "Lasting-Machines" errors appear in the printed specification requiring correction as follows: Page 2, line 20, for the word "of" read *by*; page 5, line 24, for the word "preliminary" read *preliminarily*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of April, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

rections in Letters Patent No. 1,057,606.

movement to the pincers, means under control of the operator which, after actuation by him, causes said pincer operating means to impart a relatively slow lasting movement to the pincers, and means for automatically restoring the quick movement to the pincers after a single lasting movement, substantially as described.

30. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting movement to the pincers, and mechanism arranged to be connected by the operator before the commencement of the lasting operation and thereafter wholly operated and controlled by the machine for imparting a relatively slow lasting movement to the pincers for the initial lasting movement only, substantially as described.

31. A lasting machine, having, in combination, pincers for seizing the upper, means for imparting normally a quick lasting movement to the pincers, mechanism for imparting a relatively slow lasting movement to the pincers, a manually controllable device for actuating said mechanism, and a cam for disconnecting said mechanism after a single lasting movement, substantially as described.

32. A lasting machine, having, in combination, pincer operating mechanism for imparting a lasting movement to the pincers, a change-speed mechanism constructed and arranged to change the speed of operation of the pincers at a predetermined point in the cycle of operations, and means for controlling the operation of said change speed mechanism, substantially as described.

33. A lasting machine, having, in combination, pincer operating mechanism for imparting a lasting movement to the pincers, a change-speed mechanism constructed and arranged to change the speed of operation of the pincers at the commencement of a cycle of operations and to thereafter restore the former speed of operation at the completion

of the same cycle of operations, and means for controlling the operation of said change-speed mechanism, substantially as described.

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36. A lasting machine, having, in combination, pincers, pincer operating mechanism for imparting a lasting movement to the pincers, a change-speed mechanism constructed and arranged to change the speed of operation of the pincers, means, including a cam, for operating the speed changing mechanism to reduce the speed of operation for a predetermined period and then restore the former speed, a device under control of the operator for placing the speed changing mechanism under control of said cam means, and automatic means for disconnecting said device after the completion of the period of operation at the reduced speed, substantially as described.

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C. C. BILLINGS,

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