W. A. BOND.

LASTING MACHINE.

APPLICATION FILED MAY 5, 1908.

1,066,879.

Patented July 8, 1913.

2 SHEETS—SHEET 1.

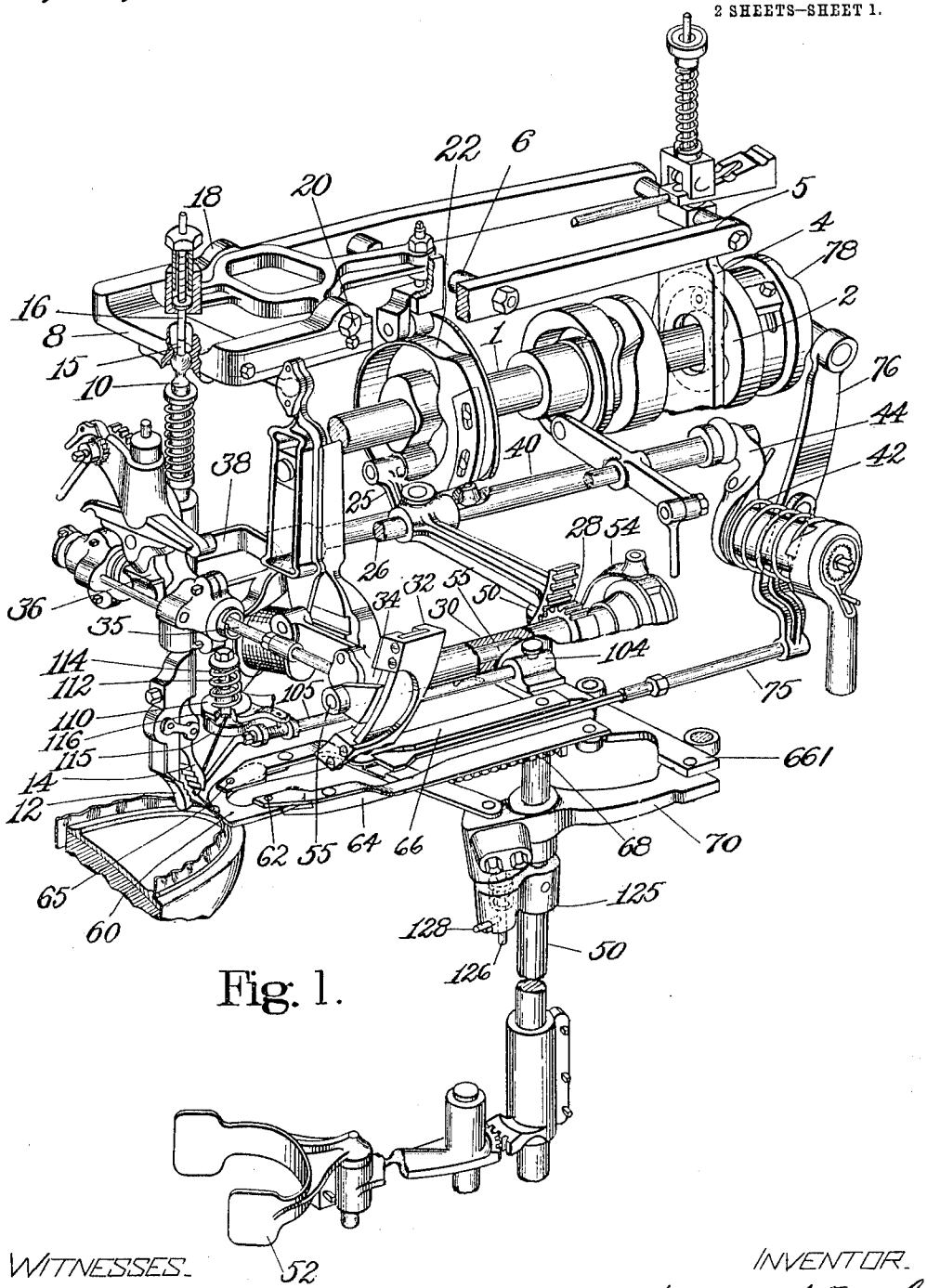


Fig. 1.

WITNESSES.

Elizabeth C. Coupe

Edith C. Holbrook

INVENTOR.

William A. Bond

By his Attorney,

Nelson W. Morrand

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. A. BOND.

LASTING MACHINE.

APPLICATION FILED MAY 6, 1908.

1,066,879.

Patented July 8, 1913.

2 SHEETS—SHEET 2.

Fig. 2.

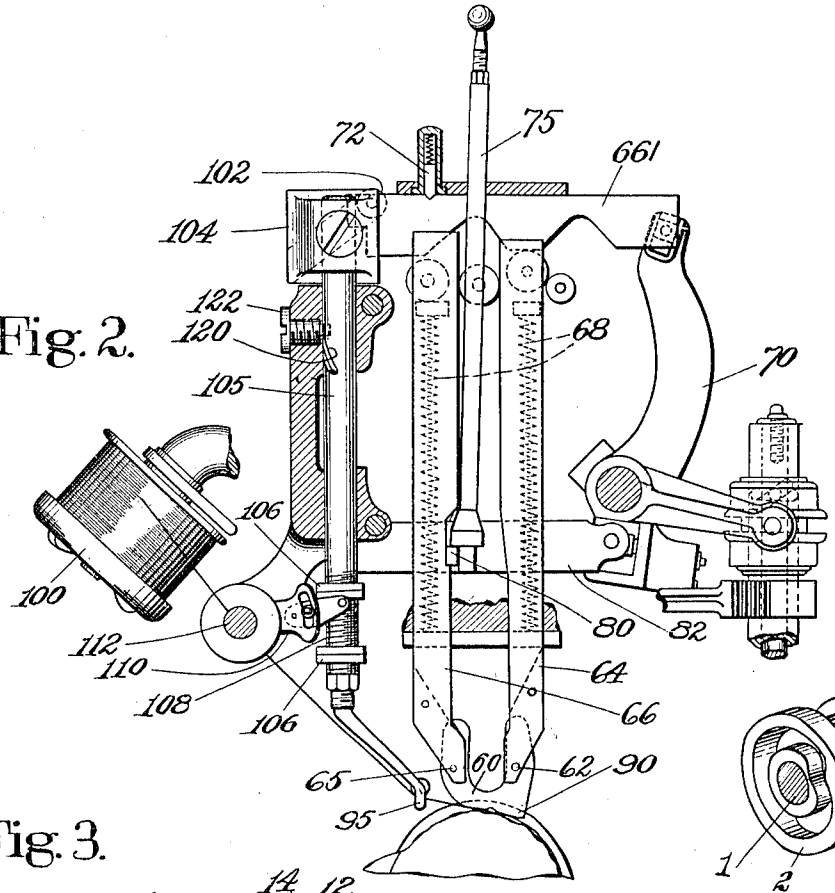
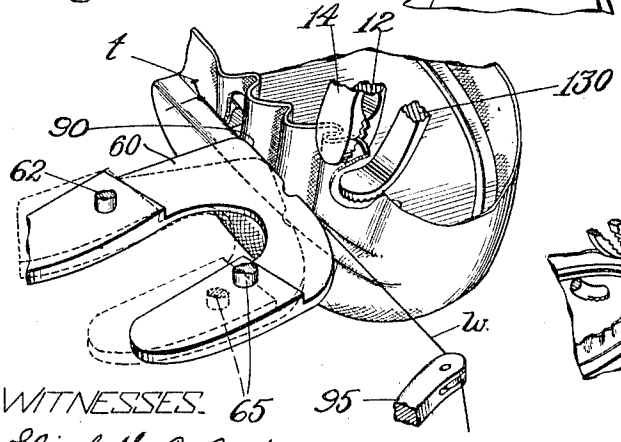
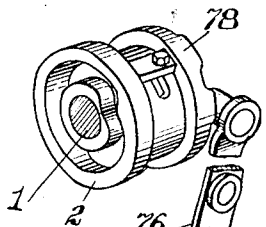


Fig. 3.





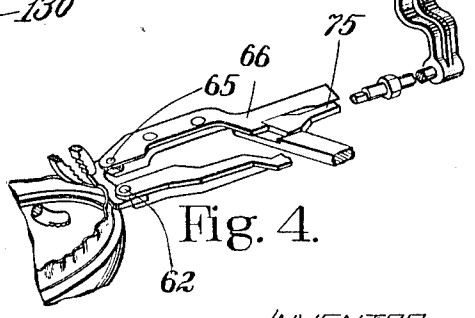


Fig. 4.

WITNESSES.

Elizabeth C. Coupe

Edith C. Holbrook

INVENTOR.

William A. Bond

By his Attorney,

Nelson Morrand

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM A. BOND, OF LYNNFIELD, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LASTING-MACHINE.

1,066,879. Specification of Letters Patent. Patented July 8, 1913.

Application filed May 5, 1908. Serial No. 431,011.

To all whom it may concern:

Be it known that I, WILLIAM A. BOND, a citizen of the United States, residing at Lynnfield, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Lasting-Machines, 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 lasting machines particularly those of the type shown in United States Letters Patent No. 584,744, and has for its object to improve the mechanism for working the upper into lasted position and securing it.

A very important feature of this invention consists in novel mechanism for wiping the upper into lasted position. This is shown as embodied in a swinging wiper arranged to be actuated inwardly and outwardly over the upper to force it into lasted position gradually and, it may be, by repeated movements over the same portions of stock. The wiper is shown as pivoted at one end upon a support and adapted to rest continuously at that end upon the work as the shoe is fed along. The wiper is connected to actuating mechanism by which it is swung inwardly about its pivotal point and its acting edge caused to have a shearing wipe over the stock. Preferably the wiper will be of greater length than the normal length of the feeding movement of the shoe so that each portion of the stock will be acted upon a plurality of times by the wiper. The actuating mechanism may advantageously be so arranged that when the wiper is in its retracted position it will be merely out of touch with the portion of upper to be next pulled by the grippers, if it is to be used with pulling grippers, and then when it is advanced it will not only force the newly pulled section of upper over the last bottom but will also act a second time upon one or more sections previously wiped over for conforming or shaping these portions to the desired contour and position. This new wiper is particularly useful in lasting welt and turn shoes in which the upper is lasted up to a lip or shoulder on the innersole to which the upper is subsequently secured by stitches. This shoulder is formed by cutting into the sole from the edge and is located farther from the edge in some shoes than in others.

Provision is made in accordance with this invention for adjusting the actuating mechanism so that the stroke of the wiper can be regulated according to the location of the shoulder. It will be understood that the machines of the type referred to are adapted to work the upper over the last step by step by engaging different portions progressively. The wiper may and preferably will be formed to extend in front of the sections of upper directly acted upon by the grippers, that is, into position to include within its sweep a portion of the upper stock in advance of the grippers and between the point at which they are pulling and the next point at which they will act. The wiper thus arranged forces toward or into lasted position such advance portions of stock, and, as it is actuated in time relation with the grippers to swing forwardly while the grippers are pulling or holding the upper, the wiper extends or widens the field of action of the machine at each operation. It is found that as a result a given portion of a shoe, as the toe portion, can be lasted with fewer operations than heretofore. For example, some operators obtain as good results with ten pulls using this wiper as they formerly obtained with fourteen pulls. And not only is a wider section of upper lasted at each pull and wipe but the swinging wiper, by its gradual inward swing or sweep as distinguished from a straight thrust or push, appears to force the upper more closely into the angle between the shoulder and the marginal portion of the innersole and, therefore, to conform the upper more satisfactorily to the contour of the subjacent faces over which it is worked.

Another important feature of this invention to which is perhaps partially due this improved quality of work is found in the fact that the wiper in the preferred construction has a movement lengthwise of the edge of the shoe as well as transversely of the edge. This is obtained in the illustrated mechanism by pivotally supporting

the wiper at a point removed inwardly at some distance from the rear end of its acting edge and connecting it pivotally to its actuator at a point similarly removed from the advanced end of its acting edge. The acting edge of the wiper thus receives in addition to its forth and back sweep transversely of the edge of the shoe a large component of movement lengthwise of the shoe edge, particularly at the rear end of its acting edge where it reciprocates backwardly and forwardly in rubbing contact with the stock in the angle between the shoulder and feather of the innersole.

In lasting the toe portion of welt and turn shoes it is customary to fasten the upper temporarily to the shoulder by a binder of wire or tape that is anchored to a tack at one side of the shoe and automatically placed progressively into position to bind the upper against the shoulder as the lasting proceeds. The binder, which is usually a thin wire is drawn from a reel and it is desirable to maintain the tension on the wire between the reel and the shoe as the lasting proceeds in order to hold the overworked upper securely against slipping back. In order to obtain the necessary length of wire for anchoring the binder it is desirable to relieve the tension at times. To obtain this variable resistance to the movement of the wire means is employed for adjusting the tension device.

In an earlier Patent No. 1,005,929, granted on my application, Serial No. 359,081, I have shown means connected with the starting and stopping mechanism for applying a suitably hard tension while the machine is running and relieving the tension when the machine is stopped. Under some conditions however it becomes necessary frequently to stop the machine while the lasting operation about the toe is in progress and when this is done the tension on the wire is liable to be relaxed to an extent that allows the upper to slip back. As may be understood from said Letters Patent No. 584,744 certain devices are put into operation or adjusted when the toe of a shoe is to be lasted, remain operative continuously during the lasting of the toe, and are thrown out of operation or readjusted when the lasting of the toe is completed.

In accordance with a further feature of this invention the tension means is operatively connected with the means for adjusting or rendering operative these other instrumentalities which are employed while the toe is being lasted. This connection is so constructed and arranged that no particular attention on the part of the operator is required for adjusting the tension device in addition to that which he gives for rendering the other instrumentalities operative and inoperative. In this arrangement the movable clamping plate of the tension mechanism is actuated independently of the starting and stopping treadle so that the full tension on the wire may be maintained whether or not the machine is running. As shown, the adjustment of the movable clamping plate is effected by the same means which controls the operation of the above mentioned angularly moving wiper or presser that is employed in the present machine for forcing the upper into position to be held by the wire. An adjustable connection is provided between the movable clamping plate and the presser-controlling mechanism such that the tension device will apply to the wire a hard tension so long as the presser remains connected to its operating mechanism and a lighter tension, which may be adjustably varied, will be applied to the wire while the presser is disconnected from its operating mechanism. In lasting around the toe of a shoe it is necessary to plait or fold the upper to take care of the fullness in the upper material and for this purpose the machine is provided with mechanism for moving the grippers laterally and with manually operated controlling means for rendering said actuating mechanism operative or inoperative.

In accordance with another feature of this invention means is provided which is connected with said controlling means for changing the tension applied to the wire by the tension device when said actuating mechanism is rendered operative or inoperative. The arrangement is such that a hard tension will be applied to the wire while the actuating mechanism is operative to move the grippers laterally and a lighter tension will be applied to the wire when the mechanism for moving the grippers laterally is inoperative. This arrangement has the advantage that after the mechanism for moving the grippers laterally has been rendered operative, the wire will be held under a hard tension at all times until said mechanism is reset, whether the machine is running or not. The wire supporter which guides the wire into position to be superimposed may be moved from its operative to its inoperative position by connection with the same means that renders operative or inoperative the mechanism for moving the grippers laterally. In this case the arrangement is preferably such that the wire supporter will be moved into its operative position and a hard tension applied to the wire when the grippers-actuating mechanism is rendered operative and the supporter will be moved into its inoperative position and a lighter tension applied to the wire when the grippers-actuating mechanism is rendered inoperative. It is sometimes desirable to employ the mechanism for actuating the grippers laterally without

also using the several parts of the wire presenting mechanism including the presser. As herein shown, the means for controlling the grippers-actuating mechanism is detachably connected with the means through which the presser is rendered operative or inoperative and the means through which the wire supporter and the tension device are adjusted. By reason of this detachable connection the controlling means may, when desired, be employed to set the grippers-actuating mechanism without disturbing the presser and the wire presenting mechanism.

These and other features of the invention, including certain combinations of parts and details of construction, will be explained more fully in the following description, and in connection with the accompanying drawings, and pointed out in the claims.

The machine which is shown as embodying the invention contains other novel features which will be described in connection with the complete machine but which are claimed in my other patent.

In said drawings, which represent a preferred embodiment of the invention, Figure 1 is a perspective view of a sufficient portion of the mechanism of the machine to illustrate the present invention. Fig. 2 is a sectional plan view of parts shown in Fig. 1. Fig. 3 is a perspective view on a larger scale. Fig. 4 shows a modification.

The main shaft 1 of the machine, which turns in suitable bearings not shown in the drawings, carries a cam block 2 having in its left-hand side a track to receive a roll on a slide 4 which is connected at its upper end to a rocking lever 5. This lever, which is fulcrumed at 6, is shown as an open frame the side bars of which are connected at their front ends by a cross plate 8. From this cross plate is pivotally suspended the gripper bar 10, which is formed as a sleeve and carries at its lower end the jaw 12. The other gripper jaw 14 is connected to a rod 15 that extends upwardly through the sleeve 10 and is engaged at its upper end by a spring-pressed plunger 16 in a lever 18. The lever 18 is fulcrumed at 20 in the lever 5 and carries at its rear end a roll that rests upon an edge cam 22. The block having the edge cam 22 has also a track in its front face to receive a roll on the lever 25, which is fulcrumed on a rod 26 and at its outer end has teeth that engage a pinion 28 on a sleeve shaft 30. This shaft is connected to a rocker 32 which carries a block 34 connected by the rod 35 with the cross head 36 by means of which the grippers are caused to move or swing laterally. The cross head 36 is supported in a yoke 38 on the front end of a slide rod 40 which carries a roll that is engaged by the rear face of the cam 22. A spring 42, acting through a lever 44, holds the rod forward with the roll against the cam. A vertical rockshaft 50, which is operatively connected with a knee lever 52, has at its upper end the yoke 54 which embraces a collar connected with a shaft 55 located within the sleeve shaft 30. The connection between the collar and the shaft 55 is such that a movement of the collar endwise of the shaft serves to turn the shaft through a small angle. The shaft 55 is connected at its front end with the block 34 whereby that block can be adjusted in the slide 32 from and toward the center of the slide for starting and stopping the lateral swinging movement of the grippers at times determined by the machine operator.

The mechanism above described for lowering and raising the grippers, closing them, swinging them laterally and forwardly and backwardly are described in said Letters Patent No. 584,744. Inasmuch as the specific construction of this mechanism forms no part of the present invention it is unnecessary to explain it in further detail in this connection, it being sufficient to state that the grippers with the jaws open are lowered by the cam 2 into position to seize the upper, closed by the cam 22, then uplifted by a further movement of the cam 2, and moved forwardly over the shoe bottom by the spring 42. When the knee lever is set to adjust the block 34 into an eccentric position in the rocker 32 the grippers receive also a lateral swinging movement for plaiting the upper, this movement taking place from left to right in the drawings.

The wiper 60, which coöperates with the grippers in forcing the upper into lasted position upon the shoe bottom, is pivotally supported at 62 upon a slide 64. The wiper is pivotally connected at 65 to an actuating bar 66. The wiper support 64 and the actuating bar 66 are adjustable endwise together for moving the wiper toward and from operative position, the forward movement being effected by a cam slide 661 and the rearward movement py springs 68. The cam slide 661 is connected by the arm 70 with the rock shaft 50, which is controlled by the knee lever 52. The spring-pressed plunger 72 is arranged to engage one or another of two notches in the rear face of the slide bar 661 to hold that bar against accidental displacement from its adjusted positions. The wiper actuator 66 is moved endwise while it is in its operative position by a connection through the rod 75 and lever 76 with an edge cam 78 adjustably carried on the back of the cam block 2. This cam 78 may have one high point, as illustrated in Fig. 1, to give one reciprocation to the actuator for each cycle of the machine's operation, or it may have a plurality of high points as illustrated in Fig. 4. The actuator 66 has a shoulder 80 which interlocks with the head of the rod 75 when the wiper is being ac-

tuated. It is desirable that the actuator remain at rest at times when the wiper occupies its inoperative position and to this end the head of the rod 75 rests upon and is movable laterally from and toward the shoulder 80 by a slide 82 that is connected with a forward extension of the arm 70 controlled by the rockshaft 50 and knee lever 52. By this arrangement the wiper is simultaneously moved toward and from its operative position and connected with or disconnected from its operating mechanism.

The wiper has a long acting face on its outer edge and is adapted to rest upon the bottom of the shoe, overlying the upper material upon the feather of the sole and pressing the upper material against the shoulder or lip of the sole and into the angle between the feather and said shoulder. The heel or right-hand portion 90 (see Figs. 1, 2, and 4) of the acting face of the wiper is adapted to have continuous engagement with the shoe, resting upon the upper all the time. The swinging movement of the wiper, which takes place about its pivotal support 62 and is effected by the actuator 66, moves the wiper, as indicated by full and dotted lines in Fig. 3. In this movement the forward portion of the acting edge of the wiper is drawn back so that it extends obliquely with relation to the edge of the shoe, as indicated in said figure, uncovering a portion of upper opposite the grippers to permit that portion of the upper to be pulled. In the next advance of the actuator the wiper is moved toward the full-line position in Fig. 3. This advance movement is timed to occur after the grippers have updrawn the upper and during or after the lateral swinging movement of the grippers for plaiting the upper. The acting edge of the wiper is of considerably greater length than the width of the grippers. It is arranged relatively to the grippers so that its heel portion 90 engages the shoe in the rear of the point where the grippers are pulling the upper and the front portion of the acting edge of the wiper extends in advance of the grippers and is adapted to engage the upper through a substantial distance in advance of the grippers. By this arrangement the wiper in its swinging movement from its retracted position shown in dotted lines in Fig. 3 to its projected position swings or sweeps over the edge of the last and presses toward lasted position not only the portion of upper that is being directly pulled by the grippers but also a substantial portion of upper in advance of that pulled by the grippers. By this construction and arrangement of the wiper the extent of upper that is worked into lasted position at each operation of the machine is materially increased. It is found in practice that as a result of the use of this wiper a given portion of the shoe can be lasted in a smaller number of operations than has heretofore been required.

It will be understood from the construction and arrangement of the wiper and its mode of operation, considering the full and dotted-line positions in Fig. 3, that in each forward movement of the wiper it travels from the position in which its acting edge extends obliquely across the edge of the last to a position in which its acting edge is substantially parallel with the edge of the last and it sweeps or wipes the upper material inwardly across the edge of the last by a shear-like movement and forces it squarely against the lip or shoulder of the sole. During this movement of the operative portion of the wiper transversely of the edge of the shoe for gathering in the upper material that is being pulled and also upper material in advance of the pulling point the heel end 90 of the wiper is moved lengthwise of the feather and shoulder of the sole and rubs the upper into the angle between said feather and shoulder. The fact that the heel end of the wiper is approximately opposite its pivotal point 62 insures that the heel portion shall move in nearly a right line having a very small component of inward and outward movement. The length of the wiper is greater than the normal length of the feeding movement of the shoe from one gripping position to another so that at each operation of the wiper a greater or less portion of the upper is acted upon a second time by the wiper. In practice substantially the entire upper material is subjected both to the transverse wiping-in movement of the wiper and also to the longitudinal rubbing movement of the heel end of the wiper by which it is formed or crimped into the angle over which it normally has a tendency to bridge, especially if the upper material is thick or stiff.

In the use of the illustrated machine for lasting welt and turn shoes in which it is customary to fasten the upper temporarily in lasted position by means of a binder *w* of wire or other continuous material the end portion of the wire is anchored to a tack *t* at the side of the shoe, and is guided by a support 95 in a plane in front of the acting face of the wiper and in position to be pressed into holding relation with the upper by the wiper. The front portion of the wiper at each forward sweep forces the binder into holding relation with the portion of upper material that is worked into lasted position by said movement of the wiper. During this swing of the wiper the heel portion thereof moves lengthwise of the wire, rubbing it into the upper and seating it securely in position to hold the upper in the angle between the feather and shoulder of the innersole. If the cam 78, shown in Fig. 4, is employed a plurality of forward

and backward reciprocatory movements of the wiper in contact with the binder are effected at each operation of the machine. In said Fig. 4 the pivotal support 62 for the wiper is located closer to the acting edge of the wiper than in the other figures. It is preferable that the pivotal point be located at a considerable distance from the acting face of the wiper in order to increase the movement of the heel end of the wiper lengthwise of the work, but the particular location of this pivotal point is not essential to the broadest aspect of the invention. The binding wire should for the best results be drawn very snugly against the upper and it is, therefore, desirable that during the toe lasting operation a moderately hard tension be applied to the wire as it comes from its source of supply, which is shown as a reel 100. For the purpose of maintaining this tension upon the wire during the toe lasting operation and releasing it after the toe lasting operation to permit the wire to be drawn freely for fastening to the anchor tacks the tension device is operatively connected with the mechanism for throwing the wiper into and out of operation. To this end the cam slide 661 has a stud 102, indicated in dotted lines in Fig. 2, that stands in a groove in a block 104 on the rear end of the shaft 105 that carries the wire support 95. This shaft has collars 106 adjustable lengthwise thereon between which is received a block 108 adjustably mounted upon the outer end of a swinging plate 110. The plate turns about a stud 112 rising from a bracket or portion of the frame and is pressed downwardly by a spring 114 against a disk 115 between which and the swinging plate the wire is clamped for producing tension. The swinging plate and the disk are provided at 116 with coöperating inclined faces so arranged that when the plate is turned in one direction it rides up the incline on the disk and relieves the tension on the wire. When the plate is turned in the opposite direction it rides down the incline and permits the spring 114 to subject the wire to the tension for which the spring is adjusted. The illustrated arrangement is such that when the cam slide 661 is moved by the knee lever 52 in the direction to project the wiper into its operative position the shaft 105 is advanced and tension applied to the wire. When the cam slide is reversely moved the tension on the wire is relieved. By adjusting the collars 106 and the block 108 the extent of tension can be varied. The shaft 105 is herein shown as provided with an oblique or spiral groove 120 into which projects a fixed stud 122 which compels the shaft to rotate as it is moved endwise. The wire supporter 95 extends laterally from the shaft in such a position that when the shaft is advanced at the time the wiper is rendered operative and tension applied to the wire the wire supporter is advanced and swung from an inoperative position where it is not liable to engage and mar the shoe into its operative position, shown in the drawings.

A detachable connection is shown between the rockshaft 50, which is turned by the knee lever 52, and the arm 70 by which the wiper and the devices associated with the wire supply are rendered operative or inoperative. This detachable connection permits the rockshaft and knee lever to be employed for rendering operative or inoperative the devices for imparting plaiting movements to the grippers without rendering the wiper and the wire supplying mechanism operative. The connection comprises a collar 125 fast upon the rockshaft and carrying a spring-pressed plunger 126 that is adapted to engage a recess in the lower face of the arm 70 for causing the arm to be turned with the shaft. The plunger has an operating bar 128 normally seated in a recess in the collar 125 but which can be lifted from said recess and retained on the lower end face of the collar when it is desired to disconnect the wiper and wire supply mechanism from the rockshaft.

In the use of the machine the shoe is presented bottom uppermost against a bottom rest 130 and the wiper having been advanced into its operative position by means of the knee lever, the shoe is raised against the heel end of the wiper. The wire will have been previously secured to the anchor tack and held between the anchor tack and the tension device.

In the operation of the machine the grippers descend with the jaws open to inclose the upwardly projecting edge of the upper, seize the upper, uplift, and then move inwardly over the shoe bottom and swing laterally to lay the upper over the shoe bottom in plaits or folds which take care of the fullness at the toe of the shoe. During the pulling and overlaying movement of the grippers the wiper advances from its retracted position, shown in dotted lines in Fig. 4, to its pull-line position sweeping the upper, that is being directly pulled by the grippers and also the upper in advance of the pulling point inwardly and somewhat backwardly by an oblique movement across the edge of the shoe and inwardly against the shoulder of the sole. In this movement of the wiper it forces the upper in the same direction in which the upper is being worked by the grippers in overlaying and plaiting it and presses or wipes it against the shoulder of the sole by a rubbing movement more or less oblique with relation to said shoulder as distinguished from a straight thrust at right angles to the edge of the shoe and to the shoulder. This rubbing wipe of the

swinging wiper is peculiarly effective in forcing the upper over the edge of the last and against the shoulder of the sole without the liability of marring the upper which exists in the use of a thrust wiper. During this inward movement of the forward portion of the wiper transversely of the edge of the shoe the heel portion of the wiper rubs backwardly over and against the upper that is already lying upon the feather. In this backward movement of the heel portion 90 and also in its return movement it crimps or forms the upper into the angle between the feather and shoulder and also firmly seats the wire in position to hold the upper in said angle. In each succeeding operation of the machine the front portion of the wiper gathers in a fresh portion of material and forces it toward lasted position while the heel portion of the wiper rubs a previously wiped-in portion of the upper. If it is desired to use the grippers for plaiting the upper to take care of fullness without using the wipers, as sometimes occurs, as, for example, in lasting shoes that are fastened with tacks instead of with wire, the plunger 126 is withdrawn from the arm 70 permitting the rockshaft to be employed for adjusting the block 34 in the rocker 32 without projecting the wiper forwardly from its inoperative position.

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

1. A machine for working an upper over a last by repeated operations applied to different portions of the shoe having, in combination, a wiper having an acting edge extending lengthwise of the edge of the shoe and mounted for oscillatory movement about a point located near one end of said wiper edge toward and from position to lay the upper over the last, and operating means for so oscillating the wiper.

2. A machine of the class described, having a wiper arranged for continuous engagement of one portion of its acting edge with the work to press the upper into the angle between the feather and shoulder of the innersole while another portion of its acting edge is moved into and out of engagement with the work, and means for reciprocating the wiper lengthwise of the feather.

3. A machine of the class described, having a wiper member arranged for continuous engagement with the work and means for actuating the wiper to move one portion from and toward the work while maintaining another portion in continuous engagement with the work.

4. A machine of the class described, having a wiper arranged for continuous engagement with the work and means for reciprocating one portion of the wiper substantially lengthwise of the edge of the shoe and another portion transversely of the edge.

5. A machine of the class described, having a wiper provided with an acting edge and two rearwardly extending legs, a pivotal support for one leg and means acting through the other leg for reciprocating the wiper.

6. A machine of the class described, having a wiper provided with an acting edge to extend along the edge of the shoe, a pivotal support for the wiper adjacent to one end of said edge and automatically operating means connected to the wiper near the other end of said edge for reciprocating the wiper.

7. A machine of the class described, having grippers for pulling an upper, a pivoted wiper and means for swinging the wiper forth and back over the work in time relation with the pulling movements of the grippers.

8. A machine of the class described, comprising grippers for pulling an upper, a wiper having a portion arranged for continuous engagement with the upper and a portion arranged for reciprocating movement in a curvilinear path toward and from the last to force the upper over the last in time relation with the grippers.

9. A machine for working an upper over a last by repeated operations at successive points, having grippers, means for actuating the grippers to seize and pull the upper, a swinging wiper having a portion adapted to engage the upper at a point in advance of the portion engaged by the grippers, and means for actuating the wiper in time relation with the grippers to force such advance portion of the upper toward lasted position.

10. A machine for working an upper over a last by repeated operations at successive points, having grippers, means for actuating the grippers to seize and pull the upper, a wiper that is materially wider than the grippers and engages the portion of upper being pulled by the grippers and also a portion of upper in advance thereof, and means for reciprocating the wiper in a curvilinear path over the last bottom in time relation with the grippers and in directions to press toward the grippers the portion of upper that is in advance of the grippers.

11. A machine for working an upper over a last by repeated operations at successive points, having grippers, means for actuating the grippers to seize and pull the upper, a wiper that is materially wider than the grippers, and means for angularly reciprocating the wiper to force toward the grippers portions of upper at and in advance of the grippers and to rub the upper in the rear of the grippers.

12. A machine of the class described, hav-

ing wiping means and actuating mechanism for reciprocating one portion of the wiping means over the shoe bottom substantially lengthwise of the edge of the shoe and another portion substantially transversely of the edge of the shoe.

13. A machine of the class described, having reciprocating means for rubbing successive portions of the shoe at the same time, the one portion transversely of the edge of the shoe and the other lengthwise thereof.

14. A machine of the class described, having reciprocating means for wiping a portion of upper over the feather and against the shoulder of the innersole in one cycle of operation and rubbing said portion of the upper lengthwise of the feather at a subsequent cycle of operation of the machine.

15. A machine of the class described, having a wiper constructed and arranged for working an upper over a last by repeated operations at successive points, and means for actuating it angularly transversely of the edge of a shoe to move one portion of its acting edge out of and into oblique relation to the edge of the shoe to work the upper over the shoe edge while another portion of its acting edge is maintained continuously in contact with the shoe.

16. A machine of the class described, having a wiper constructed and arranged for working an upper over a last by repeated operations at successive points and arranged to engage the upper with its acting edge extending obliquely with relation to the edge of the shoe, and means for actuating said wiper over the shoe bottom and turning it into a position in which its acting edge is more nearly parallel with the edge of the shoe.

17. A machine of the class described, having means arranged for continuous engagement with the upper material against the shoulder of a lasted portion of a shoe, and means for reciprocating said means lengthwise of the shoulder to form the upper into the angle between the shoulder and the feather.

18. A machine of the class described, having means arranged for continuous engagement with the upper material against the shoulder of a lasted portion of a shoe, and having an acting edge extending obliquely outwardly across the feather of the sole, and mechanism for reciprocating said means to work the upper progressively toward the shoulder.

19. A machine of the class described, having grippers for pulling an upper over a last and a reciprocating wiper arranged to engage the upper in advance of the grippers and moved backwardly toward the grippers to gather the upper inwardly toward the grippers and press it over the edge of the last.

20. A machine of the class described, having grippers for pulling an upper over a last and a reciprocating wiper arranged to engage the upper that is being directly pulled and also a portion of the upper located in advance of the grippers, and means for actuating the wiper to press the portion of upper that is in advance of the grippers inwardly and backwardly toward the grippers.

21. A machine of the class described, having grippers, means for actuating the grippers to pull the upper and to plait it, a wiper, and means for imparting to it combined advancing and swinging movement in the direction of the pulling and plaiting movement and in unison therewith.

22. A machine of the class described, having grippers, means for actuating the grippers inwardly over a last and laterally to plait the upper and lay it over the last bottom, a reciprocating wiper and means for swinging it to gather the stock inwardly and backwardly over the last bottom.

23. A machine for lasting a shoe progressively by repeated operations upon successive portions of the upper and having a wiper and means for reciprocating the wiper in a direction with relation to the edge of the shoe to gather portions of the upper and force them inwardly and backwardly to crimp the upper on the shoe bottom.

24. A machine for lasting a shoe progressively by repeated operations applied to adjacent portions of the upper, having a wiper constructed and arranged to have advancing and shearing movements relatively to and over the edge of a last and to permit the shoe to be advanced for presenting different portions successively to such action of the wiper, and means for reciprocating the wiper.

25. A lasting machine constructed and arranged to work an upper over a last progressively by repeated operations applied to successive portions as the shoe is fed past the machine and having a wiper with an acting face longer than the length of the normal feeding movements of the shoe, and means for imparting to the wiper a reciprocatory movement in a direction oblique to the length of the adjacent portion of the shoe edge.

26. A machine of the class described, having a swinging wiper one end of which is adapted to rest continuously on the work, means for retracting the other end of the wiper to uncover a portion of the edge of the shoe while the upper is being pulled thereover and for then advancing the wiper to press the pulled portion of upper over the last bottom.

27. A machine of the class described, having a wiper with an acting edge one end of which is adapted to rest continuously upon

the upper, and means for actuating another portion of the wiper angularly forth and back to press the upper into lasted position.

28. A lasting machine constructed and arranged to work an upper over a last progressively by repeated operations applied to successive portions as the shoe is fed past the machine, a swinging wiper with an acting edge longer than the length of the normal feeding movements of the shoe and adapted to rest continuously at one end upon the shoe bottom, means for retracting the wiper to uncover a portion of the shoe edge while the upper is being pulled thereover and for then advancing the wiper to force the newly pulled section of upper over the last and to act a second time upon a portion of the upper previously pulled.

29. A machine for progressively working an upper over a last and securing it, comprising a member having a portion arranged for continuous engagement with the upper on the last bottom and with a binder that holds the overworked portions of the upper, and means for oscillating said member to wipe a portion of the upper over the last bottom and press the wire into position to hold said wiped-over portion.

30. A machine for progressively working an upper over a last and securing it, comprising a swinging member having a portion arranged for continuous engagement with the upper and the binder, and means for swinging said wiper forth and back obliquely across the edge of the last to work the upper into lasted position and press the binder into holding position.

31. A machine for progressively working an upper over a last and securing it, comprising a device for placing a binding wire in position to hold the upper against the shoulder or lip of the shoe innersole, said device having a portion constructed and arranged for continuous pressing engagement with the wire, and a portion arranged for swinging movement from and toward the shoulder to press the wire into holding position.

32. A machine for progressively working an upper over a last and securing it, comprising a device for placing a binding wire in position to hold the upper against the shoulder or lip of the shoe innersole, and means for reciprocating said device lengthwise of the wire against said shoulder for seating the wire.

33. A machine of the class described having a wiper constructed and arranged for working an upper over a last by repeated operations at successive points; said wiper being provided with an acting edge of substantial extent and automatically operating means for actuating one end of said acting edge angularly, over the last bottom, relatively to the other end of the acting edge, from and toward a position in which said acting edge is substantially parallel with the edge of the shoe.

34. A machine of the class described, having a wiper constructed and arranged for working an upper over the last by repeated operations at successive points, a support to which the wiper is pivotally connected at a point removed a substantial distance back from and to one side of the acting edge of the wiper, and means for oscillating the wiper about said pivotal connection to wipe the upper inwardly and backwardly over the last edge.

35. A machine of the class described, having a wiper constructed and arranged for working an upper over the last by repeated operations at successive points, a support to which the wiper is pivotally connected at a point removed a substantial distance back from the acting edge of the wiper, an actuator for swinging one end of the wiper toward and from the shoe edge, and a pivotal connection between the wiper and said actuator.

36. In a machine of the class described, the V-shaped wiper 60 constructed and arranged for working an upper over the last by repeated operations at successive points pivotally supported at 62 and connected at 65 to the actuator.

37. In a step-by-step lasting machine, an angularly movable wiper having an acting edge which is longer than the normal length of feed movements of the shoe, said wiper being mounted to turn about an axis that is substantially perpendicular to the plane of the bottom of the shoe being operated upon and that is so located with relation to the edge of the shoe that some portion of the wiper will continuously overlie the shoe bottom, combined with automatically operating means for actuating the wiper to rub repeatedly during successive cycles of the machine over the same portion of the stock.

38. In a lasting machine, grippers, a wiper mounted to swing in a path transverse to the shoe edge and actuating mechanism constructed and arranged to impart to the wiper a plurality of reciprocations to each operation of the grippers.

39. In a lasting machine, grippers, means for actuating them to plait the upper, a wiper, and means for actuating the wiper forth and back obliquely across the edge of the last in a path which is oblique to the shoe edge and which extends substantially in the direction of the plaiting movement of the grippers.

40. In a lasting machine, grippers, means for swinging the grippers laterally to plait the upper, a wiper, and means for swinging it in the direction to assist the grippers in plaiting the upper in time relation with the grippers.

41. In a lasting machine, reciprocating mechanism for working an upper into lasted position one portion acting to wipe the upper transversely across the edge of the last in one operation and another portion acting to rub the same portion of upper lengthwise of the edge of the last in a succeeding operation.

42. A machine for working an upper over a last by repeated operations applied to successive portions of the shoe, said machine having a reciprocating wiper having one part arranged to force a portion of the upper transversely over the last toward lasted position in one operation of the machine and another part to rub that portion of the upper lengthwise of the edge of the last in a succeeding operation of the machine.

43. In a machine of the class described, the combination with means, including a presser for working an upper over a last, of a supporter for wire to be superimposed for binding the upper in overworked position, a tension device, and connected means for rendering the presser operative or inoperative and changing the tension applied by the tension device to the wire.

44. In a machine of the class described, the combination with means for working an upper over a last, a tension device for applying tension to wire to be superimposed for holding the upper, actuating mechanism adapted to be adjusted into and out of operative connection with the overworking means, and means controlled by the adjustment of said actuating mechanism for varying the tension on the wire.

45. In a machine of the class described, the combination with means for working an upper over a last, a tension device for applying tension to wire to be superimposed for holding the upper, actuating mechanism for the overworking means, and means under control of the operator for shifting the actuating mechanism into and out of operative connection with the overworking means and also adjusting the tension device to vary the tension on the wire.

46. In a machine of the class described, the combination with means for working an upper over a last, a tension device for applying tension to wire to be superimposed for holding the upper, a wire supporter movable toward and from position to guide the wire, and connected means for moving the wire supporter toward and from operative position and changing the tension applied by the tension device to the wire.

47. In a machine for working an upper over a last, the combination with grippers, and mechanism for actuating the grippers laterally to plait the upper, of a device for applying tension to a strand of wire to be superimposed for binding the upper in overworked position, and controlling means for rendering operative or inoperative said grippers actuating mechanism and changing the tension applied to the wire by the tension device.

48. In a machine for working an upper over a last, the combination with grippers and mechanism for actuating the grippers laterally to plait the upper, of a device for applying tension to a strand of wire to be superimposed for binding the wire in overworked position, and means under control of the operator for rendering the grippers actuating mechanism inoperative and causing the tension device to relax the tension on the wire while the machine is running.

49. In a machine for working an upper over a last, the combination with grippers, and mechanism for actuating the grippers laterally to plait the upper, of a device for applying tension to a strand of wire to be superimposed for binding the upper in overworked position, a supporter for guiding the wire to be superimposed, and connected means for rendering the grippers actuating mechanism and the wire supporter operative and actuating the tension device to increase the tension on the wire.

50. In a machine for working an upper over a last, the combination with grippers and mechanism for actuating the grippers laterally to plait the upper, of a device for applying tension to a strand of wire to be superimposed for binding the upper in overworked position, controlling means for rendering operative or inoperative said grippers actuating mechanism and changing the tension applied to the wire by the tension device, and a detachable connection between said means and one of the parts normally controlled by it.

51. In a machine for working an upper over a last, the combination with grippers and mechanism for actuating the grippers to plait the upper, of a controlling device for rendering said actuating mechanism operative or inoperative, a tension device, and means detachably connected with said controlling means whereby the tension device may be adjusted to change the tension on the wire when the grippers actuating mechanism is adjusted.

52. In a machine of the class described, the combination with means including a presser for working an upper over a last, of a supporter for wire to be superimposed to bind the upper in overworked position, controlling means for moving said presser and the supporter into operative positions, and other means for retaining the presser and supporter in operative positions.

53. In a machine of the class described, the combination with means for working an upper over a last, of a device for applying tension to a strand of wire to be super-

imposed for binding the upper in overworked position, manually controlled means for actuating the tension device, and other means for retaining the tension device in adjusted position.

54. A lasting machine, having, in combination, grippers for pulling the upper, a pivoted wiper constructed and arranged to have continuous engagement with the shoe at a point behind the gripping point, and means for swinging the wiper forth and back over the work in front of the gripper.

55. A lasting machine, having, in combination, grippers, means for imparting lateral movements to the grippers to plait the upper, a wiper, means for reciprocating the wiper in a path inclined laterally from the median vertical plane of the machine and extending in the direction of the plaits, and means for simultaneously initiating and suspending the plaiting movements of said grippers and wiper.

56. A machine of the class described having, in combination, grippers, mechanism to impart overdrawing and plaiting movements to the grippers, a wiper, and means to impart reciprocatory movements to the wiper corresponding in direction to the plaiting movements of the grippers.

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

WILLIAM A. BOND.

Witnesses:

ARTHUR L. RUSSELL,

ELIZABETH C. COUPE,

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