A. BATES.

LASTING MACHINE.

APPLICATION FILED SEPT. 3, 1907.

1,002,358.

Patented Sept. 5, 1911.

3 SHEETS—SHEET 1.

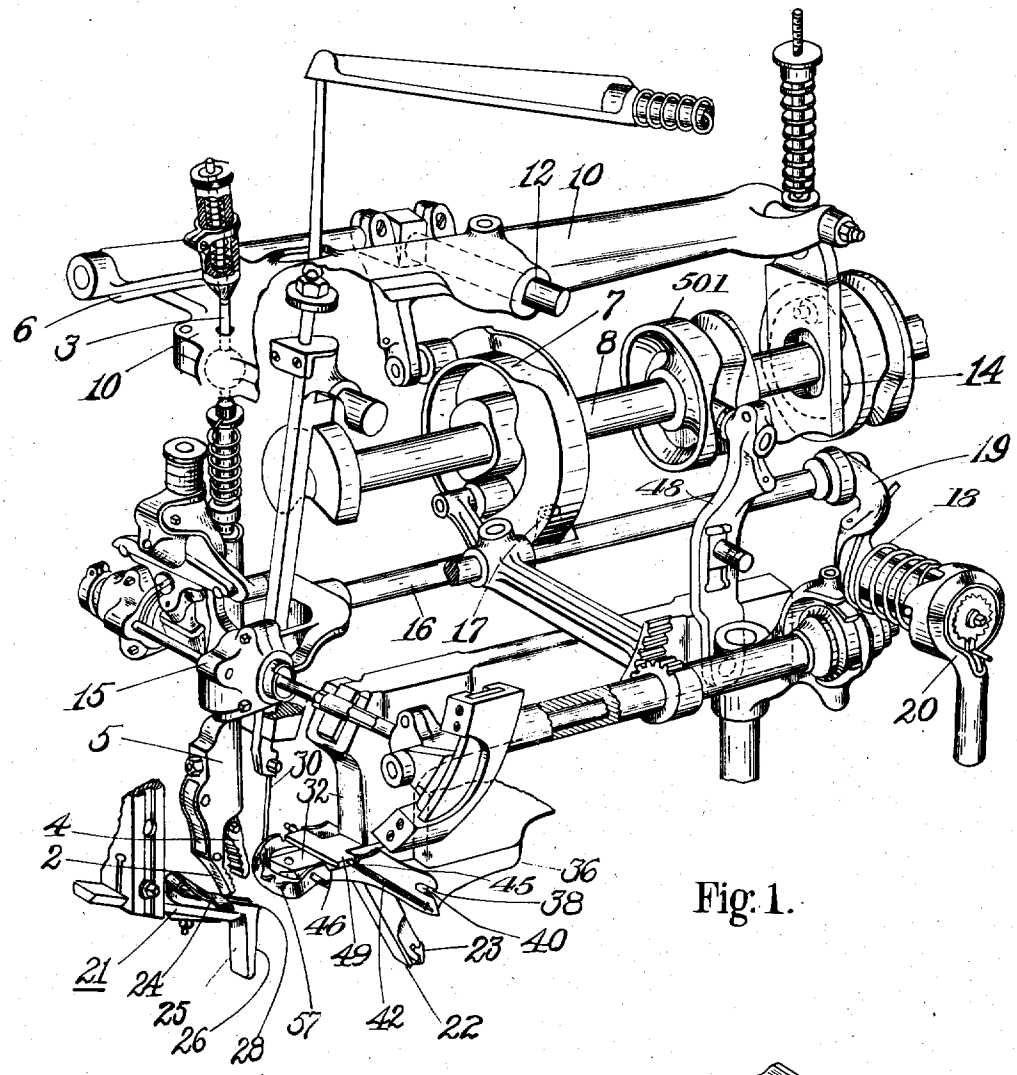

Fig. 1.

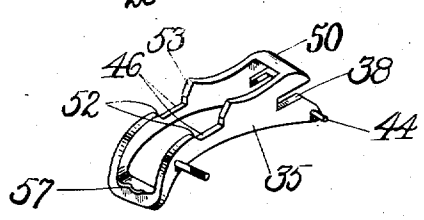

Fig. 8.

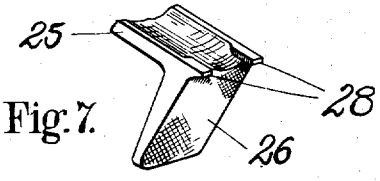

Fig. 7.

WITNESSES.

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3 SHEETS—SHEET 2.

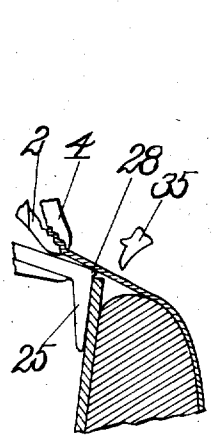

Fig. 4.

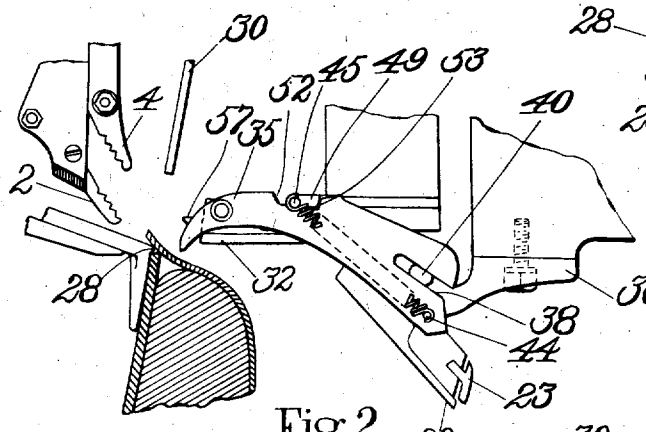

Fig. 2.

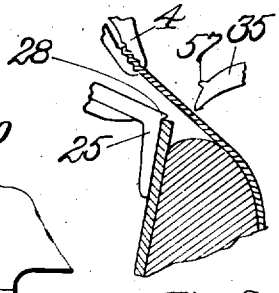

Fig. 3.

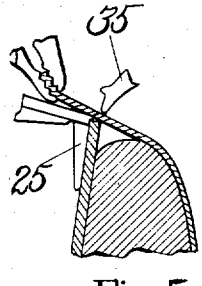

Fig. 5.

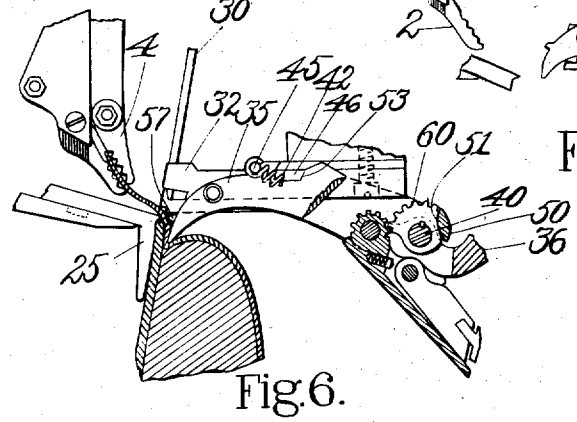

Fig. 6.

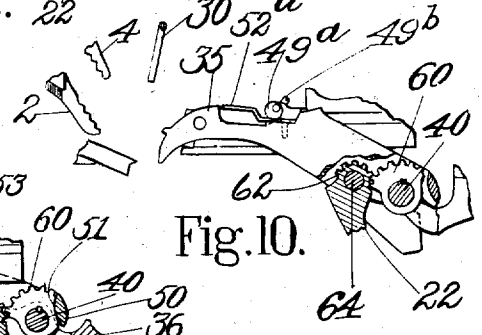

Fig. 10.

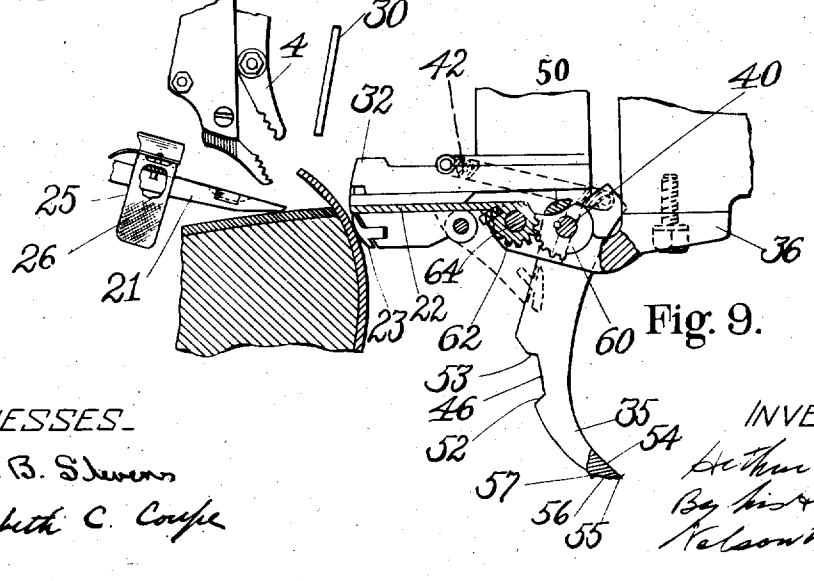

Fig. 9.

WITNESSES—

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1,002,358.

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3 SHEETS—SHEET 3.

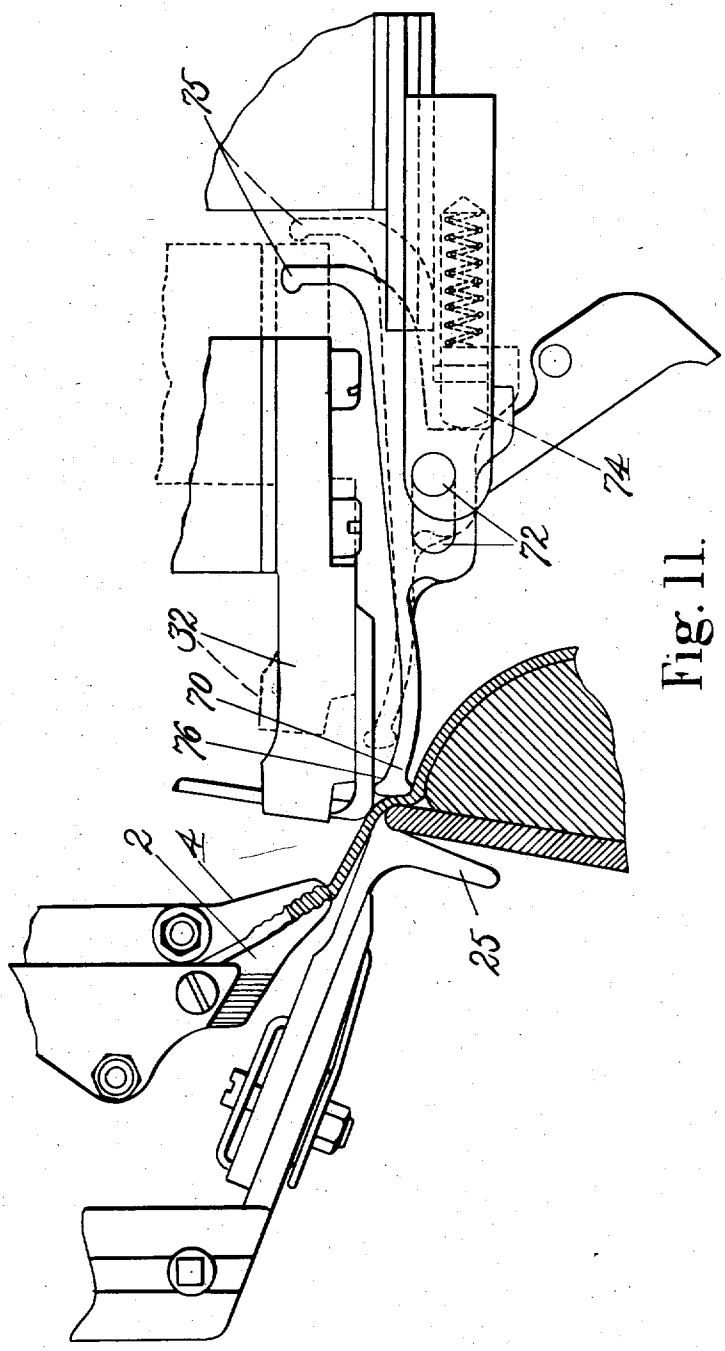

Fig. 11.

WITNESSES.

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UNITED STATES PATENT OFFICE.

ARTHUR BATES, OF LEICESTER, ENGLAND, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LASTING-MACHINE.

1,002,358. Specification of Letters Patent. Patented Sept. 5, 1911.

Application filed September 3, 1907. Serial No. 391,088.

To all whom it may concern:

Be it known that I, ARTHUR BATES, a subject of the King of England, residing at Leicester, in the county of Leicester, England, 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 machines for use in the manufacture of boots and shoes and particularly to machines employed in making those types of shoes in which the upper does not necessarily extend over upon the tread or lower face of the sole or insole. Among such types are shoes which have an outturned upper that lies upon the top face of the edge portion of the sole which projects beyond the side of the foot or last. Included in these types having outturned uppers are the shoes known in Europe and elsewhere as veldtschoen and the shoes known in the United States as stitch-down shoes. The invention is applicable to machines for lasting such shoes and securing the upper and also to machines for securing the uppers where no lasting or stretching of the upper is done or where the upper has been lasted or stretched in a previous operation or by mechanism not associated with that of the present invention.

A very important feature of this invention consists in means arranged in such machines for engaging the upper between the edge of the upper and the last and which, when employed in combination with means for applying tension to the upper or for pulling the upper over the last, may have the function of producing in the upper a degree of slack or fullness that will permit the upper to be forced into the angle formed by the side of the last and the projecting edge portion of a sole on the last bottom. This angle is sometimes hereinafter referred to as "the angle". Preferably this engaging means presses the upper toward that angle and into it to obtain the right amount of upper stock to permit the upper to be permanently secured by a seam extending transversely through the projecting portion of the sole and the outturned flange of upper lying on the top face of the sole. The said engaging device, which will be herein frequently referred to as the "presser" may be, if desired, shaped and arranged as a forming tool which will bend the upper into the angle and impart to it more or less of the form which it is to have in the finished shoe. The presser may be used with means for securing the upper and then it will for the best results hold the upper in position while it is being secured. If the presser is employed with pulling means which releases the upper after the presser comes into holding engagement with the upper it will prevent the loss of the tension to which the upper has been subjected while the right fullness is being measured off and pressed into the angle between the side of the last and the projecting edge of the sole. The amount of this fullness will of course vary with the depth of the angular crease into which the upper is to be bent. As herein shown the presser is movably mounted and means is provided for actuating it with relation to the work. This means comprises provision for yieldingly moving the presser toward the plane of the sole into a position which will vary according to the thickness of the stock. The presser is then actuated by other means which acts with a considerable force, and may be unyielding and, if desired, adjustable, to force the upper toward the last and into the angle. If the upper is held under tension it will be somewhat formed by being bent by the presser and the presser may be shaped to approximate the contour of the adjacent face of the side of the last and may press the upper against the sole so that a more or less distinct formation of the upper will be secured. If the upper is to be permanently fastened in the same operation in which the presser takes part, then the presser will preferably hold the formed upper in the position in which it is to be secured while the securing means is operating.

In the embodiment of the invention herein shown for the purpose of explaining the invention and illustrating one form of mechanism in which it can be advantageously employed, means is provided for pulling an upper over a last having a sole projecting beyond the edge of the last bottom, in combination with means for securing the upper temporarily by lasting tacks driven through the upper and into the edge of the sole. The pulling means comprises grippers which are actuated upwardly for stretching the upper and then are moved outwardly for

drawing the upper over the edge of the shoe which is held edge uppermost upwardly by the operator. The securing mechanism comprises a driver and a horizontally reciprocating tack carrying block movable over the pulled upper. The presser is movably mounted for reciprocation longitudinally toward and from the shoe and for pivotal movement downwardly into the angle between the side of the last and the projecting edge portion of the sole. It is impelled forwardly by a spring and has a recess in its upper edge in which stands a stud projecting from the reciprocating tack block. The recess presents a shoulder which the spring holds against the stud as it exerts pull to advance the presser. The recess has an inclined front face over which the stud rides when, during the forward movement of the tack block, the presser has been impelled forwardly by its spring until it has contacted with the upper that is bridged from the side of the last to the edge of the sole. As the stud rides over the incline it rocks the presser downwardly toward the side of the last, thus pulling the upper from the direction of the grippers into the angle between the last and sole. In this movement the presser measures off the amount of upper required for fitting the upper into the angle and securing it in the subsequent sewing operation by which the upper is permanently attached to the sole. In the movement of the presser to measure off the upper required to bend into the angle, the upper may pull out of the grippers which are held closed by a suitably formed cam acting through a spring, or the grippers which have been moved outwardly by a spring for overdrawing the upper may be pulled back toward the machine. The adjustment of the grippers closing and the updraw springs or the formation of the closing cam may determine which of these actions will occur. The presser is shown as formed with an edge shaped to bend and somewhat crease the upper into the angle, and with a face shaped to the approximate contour of the portion of the last adjacent to the angle. The force with which the upper is pressed downwardly into the angle and against the last depends partly upon the tension against which the upper is pulled from the grippers, and the extent of this movement which determines the amount of stock which shall be pulled back and forced into the angle to produce fullness or slack may be varied, as, for example, by the adjustment of the stud on the tack block which may be eccentrically mounted in the block. The inclined face of the recess in the presser over which the stud rides may be formed by a spring to avoid too severe straining of the upper by the presser. The outer face of the head of the presser is formed to fit against the upper resting on the top face of the projecting edge portion of the sole. The head of the presser may also have a projection to engage the upper lying over the edge of the sole and limit the downward stock-taking movement of the presser with relation to the shoe.

Preferably a work rest is provided which has a face for acting against the tread face of the projecting edge of the sole and between which and the opposed face of the presser the edge portion of the sole, together with a thickness of the upper, is clamped and held during the driving of the fastening tack into the edge of the sole. By reason of this arrangement, by which the edge of the sole is accurately positioned and is supported and clamped upon opposite sides, the tacks may be driven into the sole with more certainty and in a way to have greater holding power than if the sole were not so supported. The work rest is also provided with means in the form of a flange or fingers for engaging the edge face of the sole to position the shoe vertically. These fingers, overlying the edge of the sole, form a guide for the upper over which the upper is pulled by the presser so that the edge of the sole is not liable to be displaced or crumpled down by the upper.

The machine in which this invention is shown as embodied is of the type shown in United States Letters Patent No. 584,744 and in accordance with a feature of this invention provision is made for employing the machine for use on any portion of the shoe which may not have the upper outturned or on other types of shoes than those which have been described. To this end the work rest is movable from its operative position to expose for use another rest, and the presser is movable from its operative position to permit the use of a rest for the edge of a shoe. A particular feature of the invention is found in connecting the presser and said edge rest so that when one is moved toward its operative position the other is moved away from position for use.

It will now be understood that a further feature of the invention embodied in the illustrated machine consists in the employment, for the purpose of laying or drawing an upper across the edge of a sole that projects beyond the side of a last, of grippers or other means to engage the upper, in combination with means for supporting the work against the pull of the grippers and means for driving fastenings through the upper into the edge of the sole.

Another feature consists in imparting movement to the grippers in such manner that they first pull the upper across clear of the edge of the sole and next move the upper into contact with that edge while

maintaining the pull; and in combination with the grippers operating in this way means are provided for supporting the sole against the movements of the grippers.

These and other features of the invention will be explained in connection with the following description and will be pointed out in the claims.

Figure 1 is a perspective view of the operating parts of the machine. Fig. 2 is a side elevation of these parts of the machine directly concerned with the present invention showing the position when the machine is at rest. Fig. 3 is a view showing the positions when the grippers have gripped and updrawn the upper. Fig. 4 is a similar view at the end of the overdraw. Fig. 5 is a similar view with the presser forward. Fig. 6 is a similar view just as the tack is being driven. Fig. 7 is a perspective view showing the work rest. Fig. 8 is a perspective view showing the presser. Fig. 9 shows the parts that are intended particularly for veldtschoen work moved into inoperative positions to permit the machine to be employed for lasting other kinds of shoes. Fig. 10 shows a modification. Fig. 11 shows a further modification.

The machine of the patent mentioned includes grippers having jaws 2 and 4 mounted on shanks 3 and 5. The shank 5 is tubular and receives the rod 3 which is actuated to open and close the jaws through a lever 6 and a cam 7 on the main shaft 8. The shank 5 has a ball and socket connection with a lever 10 fulcrumed at 12 and connected at its rear end with a cam 14 on the shaft 8 by which the grippers are uplifted for drawing up the shoe upper to pull or stretch it over the last. The gripper shanks are guided through a block 15 connected with the front end of a lengthwise movable rod 16 having a stud 17 that engages the rear face of the cam block 7 by which the grippers are pulled toward the machine. The grippers are moved away from the machine in the direction to draw the upper over the last or over the edge of the sole toward position to be secured by a torsion spring 18 acting through a lever 19 against the rear end of the rod. The tension of this spring can be regulated by the adjusting device 10. For positioning the shoe there is a sole rest 21 and an edge rest comprising a thin member 22 and a thick member 23 that can be turned down as shown in dotted lines in Fig. 9, when only the thin rest is to be used. These mechanisms by which the grippers are closed and opened to grip and release the shoe upper, lifted to updraw the upper, and moved outwardly for overdrawing it are shown in Fig. 1 and reference may be had to said prior patent for a fuller description and illustration of them and a complete explanation of their operation, all of which needs to be understood in only a general way in considering the present invention.

For adapting the machine to last veldtschoen or stitchdown work, an auxiliary rest 25 is attached to the sole rest 21, as shown in Fig. 1, by a binding screw and a spring 24 which permits the auxiliary rest to be turned into the position shown in Fig. 9 when it is not needed for use. This auxiliary rest, which is shown in perspective view in Fig. 7, comprises a broad contact face 26 adapted to support the tread face of the sole and a member 28 adapted to rest upon the edge of the sole for positioning the work vertically and protecting the edge of the sole from being crumpled down by the upper as the latter is pulled over the edge face of the sole. The member 28 may be cut away or notched, as shown, to provide for the tack to be driven between the lateral edges of said member. The presser may be concaved as shown on its upper face from its end and in line with the notch backwardly to provide for a movement of the grippers toward the upper in as low a plane as the edge of the sole will allow. The auxiliary rest so positions and guides the work that tacks or other fastenings which are inserted by the driver 30 from the usual reciprocating tack carrying block 32 for securing the upper can be driven through the upper into the edge of the sole.

The presser 35 is mounted on a bracket 36 secured to the frame of the machine. The presser comprises, as shown in perspective view in Fig. 7, an open frame, the side members of which are slotted as at 38 to receive the squared or planed end portions of a shaft 40 mounted in the bracket. A spring 42 connects a stud 44 at the lower rear end of the presser with a stud 45, which is mounted upon the reciprocating tack block 32 that is actuated forwardly and backwardly by a lever 48 and a cam 50 on the main shaft. The studs 44 and 45 are so arranged with relation to the connection of the presser with the shaft 40 that the presser is actuated upwardly and forwardly, or toward the shoe, by the spring 42. The presser has a crossbar 50 at its rear end which is held by the spring 42 against a face 51 on the shaft 40. The side members of the presser are provided with recesses 46 in their upper edges, which receive a projection 49 on the reciprocating tack block. This projection conveniently carries the stud 45, before mentioned, as is shown in Fig. 6. The projection engages the rear wall 53 of the recess 46 and in its backward stroke it moves the presser rearwardly away from the work and holds it against the action of the spring 42. The front walls 52 of the recess present inclined or cam faces which are engaged by the projection 49 to force the presser downwardly against the action of the spring 42.

The arrangement is such that, as the tack block moves forwardly for presenting a tack in position to be inserted, the presser advances under the influence of its spring 42 until it engages the upper held under tension by the grippers. This engagement with the upper arrests the forward movement of the presser and the projection 49 moving forwardly with the tack block, engages the cam face 52 and moves the presser downwardly toward the side of the last. The lower or rear side 54 of the presser is formed to approximate the shape of the side of the last adjacent to it, while the front or outer side 56 of the presser is plain and shaped to force the upper against the top face of the edge portion of the sole projecting beyond the bottom of the last. The end face 55 of the presser is shaped to bend the upper into the angle between the side of the last and the projecting edge portion of the sole. The construction of the presser is such that while bending the upper into the angle it creases the upper and forms it into approximately the shape which it will have in said angle in the finished shoe. The presser will preferably be provided with a projection 57 on its front face which can act as a stop to limit the movement of the presser into the angle. This projection will, in that case, also press the upper down upon the edge face of the sole into position to receive the tack. If the movement of the presser for carrying it into the angle is greater than the projection 57 allows it to have, said projection will cause the shoe to be pushed downwardly.

The shaft 40 on which the presser is mounted supports a segment gear 60, which is in mesh with a segment gear 62 on a shaft 64, upon which the edge rests 22, 23 are pivotally mounted. By this connection the edge rests and the presser may be moved together one toward the other from operative position when it is desired to change the machine from operating upon one kind of shoes to operating upon a different kind.

In the use of the machine for operating upon veldtschoen or stitch-down shoes, the parts are positioned as shown in Fig. 2, the shoe being presented in the hand of the operator with the tread face of the projecting edge portion of the sole against the face 26 of the auxiliary rest and the edge of the sole against the member 28 of the auxiliary rest. The presser will at this time occupy a raised and retracted position out of contact with the shoe. When the machine is started the grippers descend and close upon the upper and then are uplifted to pull or stretch the upper and draw it into conformity with the contour of the portions of the last over which it is pulled. The grippers then move outwardly from the position shown in Fig. 3 to the position shown in Fig. 4, carrying the upper from an updrawn position, where it is preferably out of contact with the edge of the sole, into a position in which it lies across the edge face of the sole in contact therewith. The auxiliary rest supports the edge portion of the sole so that it is not displaced laterally by the overdrawing of the upper, and the member 28 of the auxiliary rest prevents the projecting portion of the sole being crumpled down by the pressure of the upper. The tack block next advances toward the position shown in Fig. 6, and in this movement the stud 49 permits the spring 42 to move the presser forwardly until it contacts with the upper, which is at this time bridged across from the side of the last to the edge of the projecting portion of the sole. The parts are so arranged that the end portion of the presser engages the upper in about the plane of the top face of the sole and the yielding actuation of the presser by the spring permits the presser to adapt its forward position to the thickness of the sole and upper material between it and the auxiliary rest. When the advance of the presser is arrested, the stud 49 moves forwardly in the recesses in the upper edges of the presser until it contacts with the inclined or cam faces 52, when it impels the presser still farther forwardly, causing it to clamp the stock somewhat firmly against the face 26 of the auxiliary rest. As the stud 49 rides up the inclined face 52 it forces the presser downwardly, causing the presser to bend the upper material into the angle between the side of the last and the top face of the sole, producing an outturned flange of the upper and forming the upper against the side of the last and the side face of the sole into substantially the position which the upper occupies in the finished shoe. The presser is held in this position until the tack has been driven and the tack block is retracted. It is to be observed that the presser coöperates with the auxiliary rest in clamping the projecting edge portion of the sole and holding it between the opposed faces of said members during the tack driving operation, so that the projecting portion of the sole is positioned in definite relation to the ingoing tack and is supported upon its opposite sides while the tack is being driven. This arrangement enables a tack to be driven through the upper and into the edge portion of a sole for securing the upper even in a sole which is so thin or so flexible that it would be impractical to tack the upper to its edge if the sole were not supported. The tack block serves as a presser for wiping and folding the upper upon the outer edge face of the sole in position to be secured by the ingoing tack. As the presser is forced downwardly to bend the upper into the angle between the side of the last and the projecting portion of the sole, it draws

the edge portion of the upper backwardly from the position to which it has been pulled by the grippers. This is done because the upper which has been pulled over the last is already under tension about the last. It is important to maintain this tension while measuring off from the pulled-over marginal portion of the upper the amount necessary to produce the outturned flange of a veldtschoen or stitch-down shoe by which the upper is secured in the said angle in completing the shoe. In drawing back the upper to bend it into the angle the upper may be pulled against the tension of the overdraw spring 18 or the cam 7 may be so formed as to open the grippers or relax their hold upon the stock, thus permitting the upper to be pulled out from between the gripper jaws in this movement. The downward movement of the presser is effected quickly and is followed immediately by the insertion of a fastening tack so that no opportunity is given for the upper to slip back even if it is pulled out of the grippers.

It will now be understood that by the use of this invention an upper is pulled about a last and then drawn backwardly from its edge through a definite distance to measure off sufficient upper material to allow the upper in the finished shoe to extend into the angle between the side of the last and the projecting edge portion of the sole and be fastened to said edge portion of the sole. The amount of upper material thus drawn back and measured off for the purpose stated appears as fullness or slack after the operation of the machine, it being understood that the same amount of material is subsequently forced into said angle and secured in completing the shoe. The amount of slack or fullness thus produced is predetermined by the extent of downward movement of the presser. This movement may be varied if desired and a construction is shown in Fig. 10, comprising an adjustable eccentric block 49^a, fastened by a binding screw 49^b which permits of varying the downward movement of the presser to increase or diminish the amount of upper material measured off and drawn back by the presser. In this figure there is also shown provision for avoiding too harsh action of the presser in its downward movement. To this end the inclined face 52^a of the presser is formed as a stiff spring which under normal conditions will not yield and will, therefore, provide a predetermined amount of slack, but which under exceptional stresses will permit the downward stroke of the presser to be shortened and prevent the presser from injuring the upper.

In Fig. 11 a modified construction is shown comprising a presser 70 secured by a pin and slot connection at 72 with a bracket on the machine frame. The presser is normally held forward to the limit of its movement in that direction by a spring-pressed plunger 74 mounted in the bracket. This forward position of the presser locates its head or acting end in line with the front end of the tack block. The plunger 74 acts upon the presser below its pivotal connection with the bracket and thus normally holds the front end of the presser raised. The presser has a tail piece 75 which extends behind said block and is engaged by the tack block to move it backwardly against the spring plunger in the rearward movement of the block. As the tack block is advanced toward position for inserting a tack the presser moves forwardly with it, contacting with the upper near the edge of the projecting portion of the sole and there its forward movement is arrested. As the tack carrier continues to advance the presser is wedged downwardly by the block, said presser being formed for this purpose with an inclined upper edge portion at 76. The downward movement of the presser, toward its full-line position in Fig. 11, causes it to force the upper into the angle between the side of the last and the projecting edge portion of the sole where it holds the upper until the tack is driven. The auxiliary rest 25 will preferably be formed as shown in Fig. 7 but the form shown in Fig. 10 may be employed if desired. In Fig. 11 the auxiliary rest is held in place by a simple concave washer and a binding screw but the spring 24 shown in Fig. 1 is preferred and that spring may be provided as shown in Fig. 9 with a locking finger to enter recesses in the rests 25 and 21 to hold the rest 25 in its operative position.

In the illustrated machine means is employed for pulling the upper about the last to work it into lasted position. It is, of course, immaterial to the invention whether the upper is worked over the last into lasted position by pulling the upper or by manipulating it in any other way and the claims which include means for "pulling" an upper over a last are to be understood as covering any means for wiping, pressing, or otherwise maintaining the upper into lasted position about the last. That feature of the present invention which relates to a novel method of lasting shoes constitutes the subject-matter of an application for United States Letters Patent Serial No. 391,089, filed September 3, 1907.

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

1. In a machine of the class described, the combination with means for pulling an upper over a last and means for fastening the

upper, of means for reversely moving the upper between the pulling means and the last to produce slack in the portion of upper extending about the last before the upper is fastened.

2. In a machine of the class described, the combination with means for straining an upper over a last, and means for tacking the upper to secure it, of means for drawing back the upper between the straining and tacking operations to produce slack.

3. In a machine of the class described, the combination with means for straining an upper over a last, and means for tacking the upper to secure it, of automatically operating means for drawing back the strained upper to produce slack therein before it is tacked.

4. In a machine of the class described, the combination with means for straining an upper over a last, and means for tacking the upper to secure it, of means constructed and arranged to draw the upper back of the tacking point to a predetermined extent after it has been strained and before it is tacked.

5. In a machine of the class described, the combination with means for straining an upper over a last, and means for tacking the upper to secure it, of means constructed and arranged to draw the upper back to a predetermined extent after it has been strained and before it is tacked, said means having provision for adjustment to vary the amount of back draw.

6. In a machine of the class described, the combination with means for pulling an upper over a last through a variable distance, and tacking mechanism for securing the upper, of means for drawing the pulled upper back through a predetermined distance to produce a definite amount of slack before the upper is tacked.

7. In a machine of the class described, the combination with means for yieldingly pulling an upper over a last, of adjustable mechanisms, operating while the upper is yet held under tension by the yielding pulling means, for drawing the upper back through a distance determined by the adjustment of said mechanism; and means for securing the upper.

8. In a machine of the class described, the combination with means for pulling adjacent portions of an upper successively over a last and over the edge of a sole projecting beyond the margin of the last bottom, of means for pressing the upper into the angle formed by the last and the projecting portion of the sole.

9. In a machine of the class described, the combination with means for pulling an upper over a last and over the edge of a sole projecting beyond the margin of the last bottom, of means for pressing the upper into the angle formed by the last and the projecting portion of the sole, and means for securing the upper.

10. In a machine of the class described, the combination with means for pulling an upper over a last and over the edge of a sole projecting beyond the margin of the last bottom, of means for pressing the upper into the angle formed by the last and the projecting portion of the sole, and tacking mechanism for securing the upper to the sole.

11. In a machine of the class described, the combination with means for pulling an upper over a last and over the edge of a sole projecting beyond the margin of the last bottom, of means for supporting the projecting edge of the sole from displacement while the upper is pulled over it.

12. In a machine of the class described, the combination with means for pulling an upper over a last and over the edge of a sole projecting beyond the margin of the last bottom, of a support for the projecting edge portion of the sole having a member extending between the edge face of the sole and the upper while the upper is being pulled.

13. In a machine of the class described, the combination with means for pulling an upper over a last and over the edge of a sole projecting beyond the margin of the last bottom, of a support for the projecting edge portion of the sole having a member extending between the edge face of the sole and the upper while the upper is being pulled, and means for driving tacks through the upper and into the edge face of the sole.

14. In a machine of the class described, the combination with means for pulling an upper over a last and over the edge of a sole projecting beyond the margin of the last bottom, of means for pressing the upper into the angle formed by the last and the projecting portion of the sole, and mechanism arranged to secure the upper to the edge of the sole.

15. In a machine of the class described, the combination with means for pulling an upper over a last and over the edge of a sole projecting beyond the margin of the last bottom, of means for fastening the upper and means for holding the upper in the angle formed by the last and the projecting edge of the sole while the upper is being fastened.

16. A machine of the class described, comprising means for working an upper over a last and means for fastening the pulled upper, and having provision for producing slack in the upper before it is fastened.

17. A machine of the class described, comprising means for working an upper over a last and means for fastening the pulled up-

per, and having provision for producing a definite amount of slack in the pulled upper before it is fastened.

18. A machine of the class described, comprising means for working an upper over a last, carrying a sole which projects beyond the margin of the last bottom and means for fastening the pulled upper, and having provision for insuring sufficient slack in the upper to allow the upper to be fitted into the angle between the last and the projecting edge of the sole when the shoe is finished.

19. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last and means for fastening the upper, of means for bending the upper before the fastening operation into a position to insure enough slack to permit the upper to cover the projecting portion of the sole in the finished shoe.

20. In a machine of the class described, the combination with means for pulling an upper over a last, and means for fastening the upper, of means for moving the pulling means in a direction reverse to that of its pulling movement to produce slack between the last and fastening point before the upper is fastened.

21. In a machine of the class described, the combination with grippers and means for yieldingly actuating the grippers away from a shoe to pull the upper over the last, means for reversely moving the grippers to produce slack between the last and fastening point, and means for thereafter fastening the upper.

22. In a machine of the class described, the combination with grippers and means for yieldingly actuating the grippers away from a shoe to pull the shoe upper over the last, means for engaging the pulled upper and reversely moving the grippers to produce slack back of the fastening point, and means for thereafter fastening the upper.

23. In a machine of the class described, the combination with grippers and yielding means by which the grippers are actuated through varying distances to pull uppers according to the elasticity of the stock, means for reversely moving the grippers through a predetermined distance, and means for fastening the upper.

24. In a machine of the class described, the combination with grippers and means for uplifting them to stretch an upper over a last, means for moving the grippers outwardly to overdraw the upper, means for effecting a predetermined inward movement of the grippers, and means for thereafter fastening the upper.

25. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, of a device constructed and arranged for engaging the upper between the last and the grippers, to press the upper into the angle formed by the last and the projecting edge of the sole, means for actuating said device and means for fastening the upper.

26. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, of a device formed for engaging the upper between the last and the grippers to press the upper into the angle formed by the last and the projecting edge of the sole, and tack driving mechanism constructed and arranged to actuate said device to press the upper into the angle and then to insert a tack for fastening the upper.

27. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, of a device formed for engaging the upper between the last and the grippers to press the upper into the angle formed by the last and the projecting edge of the sole, and tack driving mechanism comprising a reciprocating member operatively connected to said device to cause it to press the upper into the angle before a tack is driven.

28. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, of a device formed for engaging the upper between the last and the grippers to press the upper into the angle formed by the last and the projecting edge of the sole, and means for inserting tacks to fasten the upper, said machine having provision for relatively moving the device and the shoe to cause the upper to be pressed into the angle before the tack is driven.

29. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, and means for fastening the upper, of a device for pressing the upper into the angle formed by the last and the projecting edge of the sole, and actuating mechanism for moving said device into position over said angle and then into said angle.

30. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, and means for fastening the upper, of a device for pressing the upper into the angle formed by the last and the projecting edge of the sole, means for actuating said device into position over said angle and other means for forcing said device into said angle.

31. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, and means for inserting tacks through the upper and into the edge of the sole, of means for automatically clamping the projecting edge of the sole during the insertion of a tack.

32. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, and means for inserting tacks through the upper and into the edge of the sole, of means for clamping the upper against the projecting edge of the sole during the insertion of a tack.

33. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, and means for inserting tacks through the upper and into the edge of the sole, of means for forcing the upper against the side of the projecting edge of the sole during the insertion of a tack.

34. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole which projects beyond the edge of the last, and means for inserting tacks through the upper and into the edge of the sole, of a rest for the tread face of the sole and means for clamping the upper against the opposed side of the projecting edge of the sole during the insertion of a tack.

35. In a machine of the class described, the combination with means for pulling an upper over a last, and means for inserting tacks through the upper and into the edge of a sole on the last bottom, of means for clamping the sole in the direction of its thickness during the insertion of the tack.

36. In a machine of the class described, the combination with means for pulling an upper over a last, and means for inserting tacks through the upper and into the edge of a sole on the last bottom, of means comprising relatively movable parts of the machine for clamping the sole in the direction of its thickness during the insertion of the tack.

37. In a machine of the class described, the combination with means for pulling an upper over a last, and means for inserting tacks through the upper and into the edge of a sole on the last bottom, of means actuated automatically for clamping the sole in the direction of its thickness during the insertion of the tack.

38. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face, of a presser for forcing the upper into contact with the side face of the last adjacent to its edge, and means arranged to tack the upper to the edge of the sole.

39. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face, of a presser, means for actuating the presser to force the upper against the side face of the last adjacent to the sole and means for inserting tacks through the upper into the edge of the sole.

40. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face, of devices for pressing the upper into contact with the edge of the sole and with the side face of the last adjacent to the sole, and means for inserting a tack through the upper and into the edge of the sole.

41. In a machine of the class described, the combination with grippers and mechanisms for actuating them to grip an upper, pull it over a last carrying a sole on its bottom face and then release the upper, of tack driving mechanism arranged relatively to the grippers to drive a tack into the edge face of the sole, and automatically operated devices movable over the upper for pressing it into contact with the side of the last and with the edge of the sole and holding the upper while a tack is inserted for fastening it.

42. In a machine of the class described, the combination with grippers and mechanisms for actuating them to grip an upper, pull it over a last carrying a sole on its bottom face and then release the upper, of tack driving mechanism arranged relatively to the grippers to drive a tack into the edge face of the sole, and automatically operated devices for conforming the upper to the contour of the side of the last and holding it while a tack is inserted for fastening it.

43. In a machine of the class described, the combination with grippers and mechanisms for actuating them to grip an upper, pull it over a last carrying a sole which projects beyond the side of the last and releasing the upper, of tack driving mechanism and means for pressing the upper into conformity with the contour of the side of the last and the projecting edge of the sole and holding it while a tack is inserted.

44. In a machine of the class described, the combination with automatically operated means for pulling an upper over a last carrying a sole on its bottom face which projects beyond the side of the last, of means for securing the upper to the sole and means for forcing the upper into conformity with the contour of the side of the last and holding it while it is secured to the sole.

45. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bot-

tom face which projects beyond the side of the last, of means for forcing the upper into position to be secured to the projecting edge of the sole.

46. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face which projects beyond the side of the last and means for securing the upper, of means for forcing the upper against the upper face of the sole and holding the upper in position to be secured.

47. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face which projects beyond the side of the last, of a presser for forcing the upper into the angle formed by the projecting edge of the sole and the side of the last, and means for limiting the movement of the presser into said angle.

48. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face which projects beyond the side of the last, of a presser for forcing the upper into the angle formed by the projecting edge of the sole and the side of the last, and a stop carried by the presser for engaging the upper extending over the edge of the sole to limit the movement of the presser.

49. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face which projects beyond the side of the last, of a presser for forcing the upper into the angle formed by the projecting edge of the sole and the side of the last, means for yieldingly actuating the presser, and means for limiting the movement of the presser into said angle.

50. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face which projects beyond the side of the last, of a presser for forcing the upper into the angle formed by the projecting edge of the sole and the side of the last, and adjustable means for actuating the presser and a stop on the presser for limiting its movement into the angle.

51. In a machine of the class described, the combination with means for pulling an upper over a last carrying a sole on its bottom face which projects beyond the side of the last, of a presser for forcing the upper into the angle formed by the projecting edge of the sole and the side of the last, and means for driving a tack through the upper into the edge of the sole, and means movable substantially perpendicularly to the edge of the sole for pressing the upper into position to be secured.

52. In a machine of the class described, the combination with grippers and mechanisms to actuate the grippers to seize the upper, pull it over a last, and release it, of means for pressing the upper into conformity with the side face of the last and against the top face of the projecting edge of a sole which is larger than the last bottom and holding the upper in position to be secured to said projecting edge of the sole.

53. In a machine of the class described, the combination with grippers and mechanisms to actuate the grippers to seize the upper, pull it over a last and release it, of means for pressing the upper into an angle formed by the side of the last and the edge portion of a sole projecting beyond the side of the last and holding the upper in position to be secured to said edge portion of the sole.

54. In a machine of the class described, the combination with means for pressing an upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last and means for actuating said presser, of mechanism constructed and arranged for securing the upper to the edge of the sole while it is so held.

55. In a machine of the class described, the combination with means movable toward the side of the last to press the upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last, of means for limiting the said movement of the presser into the angle independently of the last.

56. In a machine of the class described, the combination with means for pressing an upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last, of mechanism constructed and arranged for securing the upper to the edge face of the sole while it is so held, and means for positioning the shoe with relation to the presser and the securing mechanism, said machine having provision for relatively moving the presser and the positioning means.

57. In a machine of the class described, the combination with means for pressing an upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last, of mechanism constructed and arranged for securing the upper to the edge face of the sole while it is so held, and means coöperating with the presser to clamp the sole and upper during the securing operation.

58. In a machine of the class described, the combination with means for pressing an upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last, of mechanism for tacking the upper to the edge face of the sole while

it is so held, and means operatively connecting the presser and the securing means to actuate them in timed relation.

59. In a machine of the class described, the combination with means for pressing an upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last, of mechanism for securing the upper to the sole while it is so held, and connections through which the presser is actuated from the securing mechanism.

60. In a machine of the class described, the combination with means for pressing an upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last, of means for actuating the presser having provision for variations in the length of the movement of the presser according to the thickness of the stock, and mechanism for securing the upper to the sole while it is held by the presser.

61. In a machine of the class described, the combination with means for pressing an upper into the angle formed by the side face of a last and a sole projecting beyond the side of the last, of means for yieldingly actuating the presser toward the plane of the sole, other means for actuating the presser toward the side of the last, and means for securing the upper to the sole while it is held by the presser.

62. In a machine of the class described, the combination with means for pulling an upper over a last, and means for securing the upper, of means for measuring off a portion of upper and holding it during the securing operation to provide fullness after the upper is secured.

63. In a machine of the class described, the combination with means for pulling an upper over a last, and means for securing the upper, of means arranged to be actuated automatically in time relation with the securing means for measuring off a portion of upper to provide temporary fullness after the upper has been pulled and before it is secured.

64. In a machine of the class described, the combination with means for pulling an upper over a last, carrying a sole which projects beyond the edge of the last, and means for securing the upper, of means operating automatically before the upper is secured to measure off the amount of fullness required to allow the upper to extend into the angle between the side of the last and the projecting edge of the sole.

65. In a machine of the class described, a presser and an edge rest arranged to occupy the same operative position alternatively, and connections through which said parts are moved simultaneously one toward and the other away from operative position.

66. In a machine of the class described, a forming tool constructed and arranged to press the upper into the angle made by the side of the last and the projecting edge portion of the sole, and means for imparting to the tool an operative movement toward the last in a plane substantially parallel with the plane of the last bottom.

67. In a machine of the class described, a forming tool constructed and arranged to press the upper into the angle made by the side of a last and the projecting edge portion of a sole, said tool having means for limiting its movement into the angle.

68. In a machine of the class described, the combination with means for pulling an upper over a last, of a forming tool constructed and arranged to press the upper into the angle made by the side of a last and the projecting edge portion of a sole, and means for supporting the tread face of the sole opposite to the point at which the forming tool operates.

69. In a machine of the class described, a forming tool constructed and actuated to press the upper into the angle made by the side of a last and the projecting edge portion of a sole, combined with means constructed and arranged for securing the upper to the edge face of the sole while it is held by the forming tool.

70. In a machine of the class described, a forming tool shaped and arranged to bend the upper into the angle between the side of a last and the projecting edge portion of a sole, and means for actuating the tool toward the plane of the last bottom to position it and then in the plane of the last bottom to press the upper against the adjacent faces of the sole and last.

71. In a machine of the class described, the combination with means for applying tension to an upper, of a forming tool constructed and arranged to press the upper into the angle between the side of the last and the projecting edge portion of the sole, and means for reciprocating the forming tool.

72. In a machine of the class described, the combination with means for applying tension to an upper, of a tool constructed and arranged to press the upper into the angle formed by the side of the last and the projecting edge portion of the sole, means for reciprocating the forming tool, and means for supporting the projecting portion of the sole against the thrust of the tool.

73. In a machine of the class described, a presser for the purpose stated, a support upon which the presser is mounted for pivotal and lengthwise movements, a spring arranged to move the presser toward the work, and means holding the presser normally away from the work and arranged to move the presser pivotally when it has engaged the work.

74. In a machine of the class described, a presser for the purpose stated having a recess, a support upon which the presser is mounted for pivotal and lengthwise movements, a spring arranged to move the presser toward the work, a reciprocating actuator having a stud standing in the recess in the presser, said recess having an abrupt rear wall and an inclined front wall whereby engagement of the stud with the rear wall of the recess holds the presser against the spring, and engagement of the stud with the inclined wall of the recess turns the presser.

75. In a machine of the class described, a presser for the purpose stated, a support upon which the presser is mounted for pivotal and lengthwise movements, a spring arranged to move the presser toward the work, an actuator and connections whereby the presser accompanies the actuator forwardly under influence of the spring until it engages with the work and is then rocked about its pivot.

76. In a machine of the class described, a presser for forcing an upper into the angle between the side of a last and the edge portion of a sole projecting beyond the side of the last, means for yieldingly actuating the presser toward the plane of the sole, and other means for actuating the presser toward the side of the last.

77. In a machine of the class described, a presser for forcing an upper into the angle between the side of a last and the edge portion of a sole projecting beyond the side of the last, a spring for moving the presser toward the plane of the sole, a driven actuator and connections between the actuator and the presser by which the presser is moved toward and from the side of the last and is retracted from the plane of the sole.

78. In a machine for the purpose stated, the combination with suitable actuating mechanism, of grippers, a work rest, and tacking mechanism relatively arranged to cause an upper to be stretched across the edge of a sole on a last and a tack to be driven through the upper into the edge of the sole for holding the upper.

79. In a machine for the purpose stated, the combination with grippers and a work rest arranged to support with its edge uppermost a last having a sole on its bottom, of means for actuating the grippers to pull the upper over the edge of the sole and tacking mechanism arranged to insert tacks through the upper into the edge of the sole.

80. A shoe lasting machine constructed and arranged to permit the shoe to be presented to the machine with the edge of the last uppermost and the top face of the shoe toward the machine for the upper to be pulled across the edge face of the sole having, in combination, means for pulling the upper, and a shoe rest having a member for engaging the tread face of the sole, and a member for engaging the edge face of the sole.

81. In a lasting machine, a shoe rest having a face for engaging the tread face of the sole and a member for engaging the edge face of the sole, combined with grippers and actuating mechanism therefor arranged to pull the upper in a plane approximately parallel with the tread face of the sole.

82. In a lasting machine, a shoe rest having a face for engaging the tread face of the sole and a member for engaging the edge face of the sole, combined with grippers and actuating mechanism therefor arranged to pull the upper first in a plane approximately parallel with the tread face of the sole and then transversely over the edge of the sole.

83. In a lasting machine, a shoe rest having a face for engaging the tread face of the sole and a member for engaging the edge face of the sole, combined with grippers and actuating mechanism therefor arranged to pull the upper first in a plane approximately parallel with the tread face of the sole and then transversely over the edge of the sole, and mechanism arranged to insert tacks through the upper into the edge of the sole.

84. In a lasting machine, a shoe rest having a face for engaging the tread face of the sole and a member for engaging the edge face of the sole, combined with grippers and actuating mechanism therefor arranged to pull the upper first in a plane approximately parallel with the tread face of the sole and then transversely over the edge of the sole, and means coöperating with the tread rest to clamp the sole in the direction of its thickness during the insertion of tacks.

85. In a machine arranged to insert tacks into the edge of a sole, the combination with tack driving mechanism, of automatically reciprocating means for clamping the sole in the direction of its thickness in time relation with the insertion of the tacks,

86. In a machine arranged to insert tacks into the edge of a sole, the combination with tack driving mechanism, of automatically actuated means for clamping the sole in the direction of its thickness while a tack is being driven and releasing the sole between the tack inserting operations.

87. In a machine arranged to insert tacks into the edge of a sole, the combination with tack driving mechanism, of means comprising a member actuated by the tacking mechanism transversely of the direction of the tack driving movement for clamping the sole in the direction of its thickness while a tack is being driven.

88. In a machine for the purpose stated, the combination with suitable actuating mechanism, of grippers, a work rest and

tacking mechanism relatively arranged to cause an upper to be stretched upwardly out of contact with the edge of the sole and then to be drawn across the edge of the sole while under tension, and a tack to be driven through the upper into the edge of the sole.

89. In a machine for the purpose stated, the combination with grippers, and mechanism to actuate the grippers to pull an upper in a plane approximately parallel with the tread face of the sole and then over the edge of the sole, of a work rest for engaging the tread face and the edge of the sole to resist said two pulling movements.

90. In a lasting machine, a rest having a face for engaging the tread face of the sole and a member for engaging the edge face of the sole and provided with an opening to permit a tack to be inserted in the edge face of the sole.

91. In a lasting machine a rest having a face for engaging the tread face of the sole and a notched member for engaging the edge face of the sole, combined with means for pulling an upper over the edge of the sole and means arranged to insert a tack through the upper and into the sole at the notch in the rest.

92. A machine of the class described having, in combination, means for tightening an upper about a last, means for driving tacks, and means to assist the operator in presenting the shoe to the tack driving mechanism in position to cause the tacks to be inserted through the upper into the edge face of the sole.

93. A machine of the class described having, in combination, means for tightening an upper about a last, means for driving tacks, and a guide for engaging the tread face of the sole to assist the operator in presenting a shoe to the tacking mechanism in position for the tack to be inserted through the upper into the edge face of the sole.

94. A machine of the class described having, in combination, means for tightening an upper about a last, means for driving tacks, and shoe guiding means between which the shoe sole is positioned relatively to the tacker to receive the tack through the upper into the edge face of the sole.

95. In a machine for use in making shoes having outturned flanges, a forming tool constructed and arranged to enter the angular space between the side of the shoe and said flange, means for relatively actuating the tool and the shoe in a direction substantially perpendicular to the side face of the last to press the stock inwardly, and means for relatively actuating the tool and the shoe in a different direction to clamp the flange against the outwardly projecting edge of the sole.

96. In a machine for use in making shoes having outturned flanges, a forming tool constructed and arranged to press the upper into the angle made by the side of a last and the projecting edge portion of a sole, and automatically operating means for relatively actuating said tool and the last in a direction transverse of the last to force the upper into said angle.

97. In a machine for use in making shoes having outturned flanges, a forming tool constructed and arranged to press the upper into the angle made by the side of a last and the projecting edge portion of a sole, and automatically operating means for yieldingly actuating said tool to press the upper transversely of the last into said angle.

98. In a machine for use in making shoes having outturned flanges, a forming tool constructed and arranged to press the upper into the angle made by the side of a last and the projecting edge portion of a sole, automatically operating means for yieldingly actuating said tool to press the upper in a direction transverse of the last into said angle, a support for the opposite side of the sole, and means for relatively actuating said forming tool and the support to clamp between them said upper flange and edge portion of the sole.

99. A machine of the class described, having in combination, a forming tool constructed and arranged to force the upper into the angle between the side of a last and the projecting edge of a sole, a rest for the opposite side of the sole, and automatically operated means to actuate said tool and rest relatively to press the upper into said angle and clamp the stock between them.

100. A machine of the class described, having in combination, a forming tool constructed and arranged to force the upper into the angle between the side of a last and the projecting edge of a sole, a rest for the opposite side of the sole, and means to impart to said tool and rest relative movements in planes substantially perpendicular respectively to the side face of the last and to the top face of the sole to form the upper into said angle.

101. A machine of the class described, having in combination, a forming tool constructed and arranged to shape an upper having an outturned sole attaching flange into the angle between the side of the last and the projecting portion of the sole, a rest for the bottom face of the sole, and automatic means for imparting to said forming tool a movement substantially perpendicular to the said side face of the last to force the upper into said angle.

102. A machine of the class described, having in combination, a forming tool constructed and arranged to shape an upper having an outturned sole attaching flange into the angle between the side of the last

and the projecting portion of the sole, a rest for the bottom face of the sole, and means for imparting to said forming tool a movement substantially perpendicular to the said side face of the last to force the upper into said angle, said machine having provision for permitting said rest and tool to adapt themselves to the thickness of the interposed stock and hold the stock under compression while the upper is connected to the sole.

103. A machine of the class described, having in combination, a forming tool constructed and arranged to shape an upper having an outturned sole attaching flange into the angle between the side of the last and the projecting portion of the sole, a rest for the bottom face of the sole, and automatic means for relatively actuating said rest and tool to clamp the interposed upper flange and projecting portion of the sole first yieldingly and then more firmly.

104. A machine of the class described, having in combination, a forming tool constructed and arranged to shape an upper having an outturned sole attaching flange into the angle between the side of the last and the projecting portion of the sole, a rest for the bottom face of the sole, and automatic means for relatively actuating said rest and tool to clamp the interposed upper flange and projecting portion of the sole and then to actuate the tool toward the side of the last to shape the upper in said angle.

105. A machine for use in making shoes having an outturned sole attaching flange, having in combination, a bottom rest, a forming tool and automatic actuating mechanism whereby to effect a tightening of the upper about the last and a clamping of the flange against the top face of the projecting edge of the sole, said mechanism including means for moving the tool laterally from and toward the side of the last.

106. A machine for use in making shoes having an outturned sole attaching flange, having in combination, a tool to tuck the upper into the angle between the side of the last and the projecting edge portion of the sole and automatic means for actuating the tool laterally toward and from the side of the last.

107. A machine for use in making shoes having an outturned sole attaching flange, having in combination, a tool to tuck the upper into the angle between the side of the last and the projecting edge portion of the sole and automatic means for actuating the tool toward and from the side of the last, a rest for the opposite side of the projecting portion of the sole and means to actuate said tool and rest yieldingly to clamp and unclamp the flange and sole.

108. A machine of the class described, having in combination, means for tensioning portions of the upper about the last, means for pressing the tensioned portion transversely of the shoe into a crease, and means for inserting separate fastenings in a direction parallel to the general plane of the sole to hold the upper to the sole.

109. A machine of the class described, having in combination, grippers for stretching an upper over a last, means for pressing the tensioned upper transversely of the shoe into position to be fastened, and means constructed and arranged relatively to said presser to drive separate fastenings through the upper and into a portion of the sole in a direction substantially parallel with the tread face of the sole.

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

ARTHUR BATES.

Witnesses:

JOHN RICHARD LAW,

ARTHUR ERNEST JERRAM.

Corrections in Letters Patent No. 1,002,358.

It is hereby certified that in Letters Patent No. 1,002,358, granted September 5, 1911, upon the application of Arthur Bates, of Leicester, England, for an improvement in "Lasting-Machines," errors appear in the printed specification requiring correction as follows: Page 3, line 53, for the reference-numeral "10" read *20*, and line 109, for the reference-numeral "*50*" read *501;* page 5, line 115, for the word "maintaining" read *manipulating;* 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 7th day of November, A. D., 1911.

[SEAL.]

E. B. MOORE,

Commissioner of Patents.

and the projecting portion of the sole, a rest for the bottom face of the sole, and means for imparting to said forming tool a movement substantially perpendicular to the said side face of the last to force the upper into said angle, said machine having provision for permitting said rest and tool to adapt themselves to the thickness of the interposed stock and hold the stock under compression while the upper is connected to the sole.

103. A machine of the class described, having in combination, a forming tool constructed and arranged to shape an upper having an outturned sole attaching flange into the angle between the side of the last and the projecting portion of the sole, a rest for the bottom face of the sole, and automatic means for relatively actuating said rest and tool to clamp the interposed upper flange and projecting portion of the sole first yieldingly and then more firmly.

104. A machine of the class described, having in combination, a forming tool constructed and arranged to shape an upper having an outturned sole attaching flange into the angle between the side of the last and the projecting portion of the sole, a rest for the bottom face of the sole, and automatic means for relatively actuating said rest and tool to clamp the interposed upper flange and projecting portion of the sole and then to actuate the tool toward the side of the last to shape the upper in said angle.

105. A machine for use in making shoes having an outturned sole attaching flange, having in combination, a bottom rest, a forming tool and automatic actuating mechanism whereby to effect a tightening of the upper about the last and a clamping of the flange against the top face of the projecting edge of the sole, said mechanism including means for moving the tool laterally from and toward the side of the last.

106. A machine for use in making shoes having an outturned sole attaching flange, having in combination, a tool to tuck the upper into the angle between the side of the last and the projecting edge portion of the sole and automatic means for actuating the tool laterally toward and from the side of the last.

107. A machine for use in making shoes having an outturned sole attaching flange, having in combination, a tool to tuck the upper into the angle between the side of the last and the projecting edge portion of the sole and automatic means for actuating the tool toward and from the side of the last, a rest for the opposite side of the projecting portion of the sole and means to actuate said tool and rest yieldingly to clamp and unclamp the flange and sole.

108. A machine of the class described, having in combination, means for tensioning portions of the upper about the last, means for pressing the tensioned portion transversely of the shoe into a crease, and means for inserting separate fastenings in a direction parallel to the general plane of the sole to hold the upper to the sole.

109. A machine of the class described, having in combination, grippers for stretching an upper over a last, means for pressing the tensioned upper transversely of the shoe into position to be fastened, and means constructed and arranged relatively to said presser to drive separate fastenings through the upper and into a portion of the sole in a direction substantially parallel with the tread face of the sole.

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

ARTHUR BATES.

Witnesses:

JOHN RICHARD LAW,

ARTHUR ERNEST JERRAM.

Corrections in Letters Patent No. 1,002,358.

It is hereby certified that in Letters Patent No. 1,002,358, granted September 5, 1911, upon the application of Arthur Bates, of Leicester, England, for an improvement in "Lasting-Machines," errors appear in the printed specification requiring correction as follows: Page 3, line 53, for the reference-numeral "10" read *20*, and line 109, for the reference-numeral "*50*" read *501;* page 5, line 115, for the word "maintaining" read *manipulating;* 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 7th day of November, A. D., 1911.

[SEAL.]

E. B. MOORE,

Commissioner of Patents.

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[SEAL.]

E. B. MOORE,
Commissioner of Patents.