

A. L. RUSSELL.  
LASTING MACHINE.  
APPLICATION FILED JUNE 6, 1910.

1,060,711.

Patented May 6, 1913.

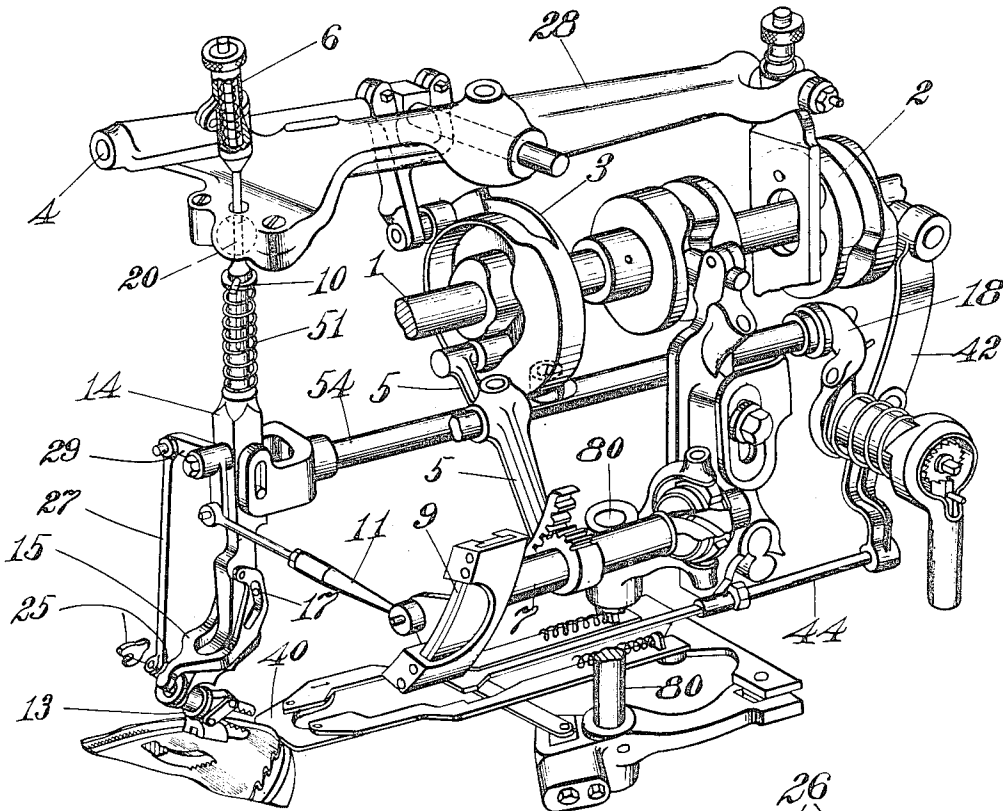


Fig. 1.

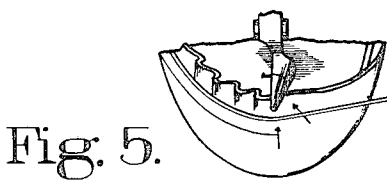


Fig. 5.

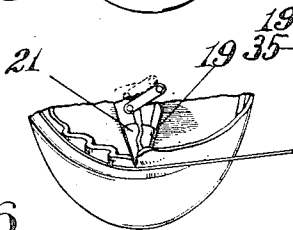


Fig. 6

WITNESSES.

Elizabeth C. Coyle  
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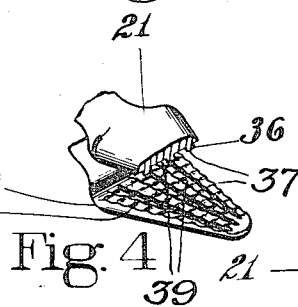


Fig. 4

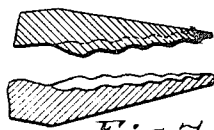


Fig. 7.

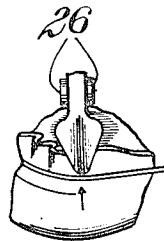


Fig. 2.

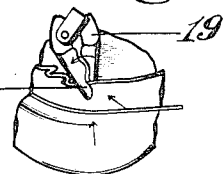


Fig. 3.

INVENTOR.

Arthur L. Russell  
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# UNITED STATES PATENT OFFICE.

ARTHUR L. RUSSELL, OF HYDE PARK, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## LASTING-MACHINE.

1,060,711.

Specification of Letters Patent.

Patented May 6, 1913.

Original application filed April 22, 1909, Serial No. 491,490. Divided and this application filed June 6, 1910: Serial No. 565,225.

*To all whom it may concern:*

Be it known that I, ARTHUR L. RUSSELL, a citizen of the United States, residing at Hyde Park, in the county of Norfolk and State 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 of the class employing grippers for pulling the upper and laying it over a last and, for some classes of work, employing wipers to press the upper into position to be secured by a binder of wire and this application is a division of an application Serial No. 491,490, filed April 22, 1909 for improvements in lasting machines.

The invention is illustrated as applied to a machine of the type shown in United States Letters Patent No. 584,744, and has for its general object to improve the gripper mechanism.

At the toe and sometimes at other parts of the shoe the grippers are required to plait or fold the marginal portion of the upper upon the shoe bottom to take care of the fullness which is incident to bending the upper inwardly over the convex edge of the last bottom and a particular object is to improve the gripped jaws to facilitate the formation of tapering plaits, as distinguished from relatively square plaits, to dispose the fullness smoothly on the last bottom.

In accordance with one important feature of this invention the grippers comprise tapered jaws which are narrow at their outer ends or points so that when they are rotated they will form a plait that tapers toward the edge of the shoe bottom and is widest at its inner end. This provision of tapering gripper jaws with means for rotating them to form a tapered plait is a valuable characteristic of this invention. Advantageously the gripping faces of the jaws and their actuating mechanism may be arranged to permit the rear edge of the jaws, that is the edge next to the portion of upper last plaited and secured, to remain in substantially the same vertical plane during the rotation of the jaws. By

reason of this arrangement the plait or fold is or may be formed mainly by drawing inwardly and backwardly the stock pulled by the grippers and the stock in advance of the gripping point without danger of disarranging or undoing the plaits previously formed. This arrangement has also the positive advantage that by pulling inwardly and backwardly the upper in advance of the grippers said advance portions of the upper are pulled over and conformed to the edge of the last and the scope or range of action of the grippers is widened so that fewer pulls are required to last a given portion of a shoe. This advantageous result may be obtained according to this invention by forming the gripper jaws with relation to their actuating mechanism so that they turn about an oblique axis located at the rear edge of their gripping faces. In one embodiment of the invention for this purpose the gripping face of each jaw is formed entirely on one lateral side of the shank of the jaws or the axis about which they are rotated. In the illustrated construction, see Figures 5 and 6 of the drawings, one half of each tapering jaw is cut away leaving a gripper which resembles a half of a tapering cone. Such a jaw has one lateral edge which is parallel with and located substantially in the plane of its axis of rotation and a second lateral edge which extends backwardly from the end of the jaw and outwardly with relation to the other edge to form a tapered gripping face. Jaws so shaped and having their rear edges, on the edges adjacent to the plait last formed, in substantially the oblique axis about which they rotate have no tendency to displace or pull out the last-formed plait while the next plait is being folded.

The formation of the gripping faces of the jaws for increasing their holding power is a novel feature of this invention. These jaws are so formed that the stock cannot move between them in the direction to pull out without automatically tightening the bite of the jaws upon the stock. To this end the jaws are formed to pull or gather in the stock widthwise between the gripping faces if the stock begins to slip toward the point of the jaws. This is effected by providing one or both of the jaws with converging faces or walls between which the stock is

gathered widthwise if it slips downward between the jaws. As shown one jaw has converging grooves formed by converging side walls and tapering in depth toward the point of the jaw so that stock is crowded together if it moves toward the point of the jaw. The other jaw is shown as having similarly formed ribs which crowd into the upper portions of the grooves a greater quantity of stock than the lower portions of the grooves will hold. The grooves and the ribs may have interlocking teeth to assist in holding the upper and the converging edges of the gripping faces of the jaws may form gripping ribs between which the stock is laterally gathered in or fulled up if it begins to slip. With the described construction the grip on the stock is automatically tightened as the stock slips so that the slipping cannot progress far enough to do any harm before it is automatically checked. This permits the grippers to be held closed by the application of less force than has heretofore been required.

These and other features of the invention, including the novel details of construction shown and certain combinations of parts disclosed, will be fully explained in connection with the following description of an apparatus embodying the invention and will then be pointed out in the claims.

Fig. 1 is a perspective view of the grippers and of those related parts of a lasting machine of the type shown in said patent which are concerned with the present invention; Figs. 2 and 3 illustrate the plaiting operation of the jaws; Fig. 4 shows the formation of the gripping faces of the jaws; Figs. 5 and 6 show the modified shape of jaw and its operation. Fig. 7 is a longitudinal section of the jaws.

The driving shaft 1 of the illustrated machine supports cam blocks 2 and 3. The block 2 has a groove in its front face from which the updraw lever 28 is actuated unyieldingly to lower the grippers to their gripping position and yieldingly to uplift them to pull the stock. The block 3 has an edge cam face from which is actuated a rock-shaft 4 carrying a yielding plunger 6 to close the grippers which are opened by a spring 51 pressing upwardly upon a stud 10 which projects from the closing rod 20 within the gripper carrying bar 14 which has a ball head by which it is suspended from the updraw lever. The block 3 has also a cam face on its rear side for engaging a stud on a rod 54 which has at its forward end a yoke connected with the grippers by which they are moved inwardly toward their gripping position in time relation with their descending movement from the cam block 2. The rod 54 is extended to the rear where it is engaged by a spring actuated arm 18 to force the grippers outwardly to draw the upper

over the last bottom in time relation with the updrawing movement and to withdraw the gripper jaws from the plait while lasting the toe.

The gripper carrying bar 14 is outwardly deflected at its lower end and has a bearing extending obliquely downwardly and inwardly within which the grippers are rotatably mounted. The grippers comprise a shank or cylindrical block 13 held in the bearing by a flange at one end and an arm 25 at the other. The block has a split clamp in which is fixed the lower gripper jaw 19 while the other jaw 21 is guided through the block to which it is connected by links 26 while the end of its shank is located in the longitudinal axis of the block and has a ball and socket engagement with a lever 15. This lever is forked and is fulcrumed at its upper end to the bar 14 which has slots in its sides for guiding the cross head 17 of the closing rod 20. The ends of the cross head extend into cam slots as shown in the forks of the closing lever for actuating the lever to close jaw 21 upon jaw 19 or upon the stock between the jaws when the rod 20 is forced downwardly. The gripping faces of the jaws are preferably tapering from a broad head to a blunt point to facilitate the formation of plaits or folds in the upper as will be described. Instead of the triangular formation of the jaws shown in Fig. 2 the jaws may have the shape shown in Fig. 5, with their rear edges in the same vertical plane as that in which the oblique axis of rotation is located and its front edge diverging from that plane to present a tapering jaw. These jaws may be substantially quarter round in cross section so that when closed they have a form similar to that of a half cone and when they are rotated as in Fig. 6 the stock is bent around one of these jaws to form a tapering fold or plait.

The gripping faces of the jaws may have the surface formation shown in Fig. 4 to enable them to hold the stock securely. This formation comprises in one jaw grooves the side walls of which extend oblique to the direction of the pull to be exerted on the stock and converge toward the point of the jaw. The grooves may increase in depth from the point toward the head and preferably will be arranged at an angle to one another. The side grooves in the jaw 19 incline in opposite directions toward the point of the jaw and the raised faces between the grooves and at either side of the jaw are of substantially the same width throughout their length. The upper clamped against jaw 19 is compressed into the grooves and cannot slip toward the point of the jaw without being compressed laterally between the converging side walls of the grooves and, as the grooves diminish in depth toward the point, the compression in the direction of

the thickness of the stock is also increased if the stock slips outwardly in the grippers. The jaw 21 has ribs 36 which force the stock into the grooves. These ribs resemble in shape the grooves 35 in that they decrease in width and in height toward the point of the jaw, although preferably to a less extent so that they wedge or pinch the upper against the walls of the grooves if it begins to slip. The raised faces of the several ribs 36 on the one jaw being in line with the grooves 35 in the other impress themselves into the upper as the jaws close and thus direct the course of the stock if it slips, compelling it to gather in or full up between the lower portions of the jaws whereby the pressure upon the stock is increased and the slipping automatically checked. Teeth 37 in the form of lateral flutings are formed on the raised faces between the grooves 35 and on the ribs 36 to assist in holding the stock and also upon the bottom of the grooves in both jaws as indicated at 39.

The bearing in the carrier 14 for the gripper block 13 extends oblique to the plane of the shoe bottom, determined by the shoe bottom and edge rests, and in substantially the direction in which the upper extends from the edge of the last to the grippers in the overdrawing movement of the grippers. The arm 25 serves to rotate the grippers about this axis when plaiting of the upper is desired and to this end the arm is connected by the rod 27, elbow lever 29 and extensible rod 11 with a segment block 9 adapted to be adjusted off the center at either side of the rocker which is fast on the front end of sleeve 7 and is oscillated by a lever 50 receiving motion from a groove in the front face of the cam block 3. The segment block is set by a connection explained in United States Letters Patent No. 500,141, with a vertical, manually shiftable rockshaft 80, having a knee yoke as shown in that patent.

The operation of the lasting machine as a whole may be substantially the same as that of the machine of said prior Patent No. 584,744, being modified slightly in detail by this invention as appears from the foregoing description. The purpose of the new mechanisms has been sufficiently explained in connection with the description of the construction and arrangement of the illustrated embodiment thereof and

I claim as new and desire to secure by Letters Patent of the United States:—

1. A machine of the class described comprising gripper jaws provided with gripping faces formed with converging ribs which act

to increase the grip on the stock automatically if the stock slips between the jaws while being pulled.

2. A machine of the class described, comprising similarly formed cooperating gripping jaws which have gripping surfaces provided with grooves of less depth than the thickness of the jaws and which decrease in depth toward the point of the jaws whereby the stock is compressed vertically if it slips between the jaws.

3. A machine of the class described comprising gripper jaws one of which has a gripping surface provided with a groove that becomes shallower toward the point of the jaw.

4. A machine of the class described comprising gripper jaws one of which has a gripping surface provided with a groove diminishing in depth toward the point of the jaw, and the other of which jaws has a rib to hold the upper in the groove.

5. A machine of the class described comprising gripper jaws provided with similarly formed cooperating gripping surfaces each having gripping ribs whose outer edge lines converge laterally toward the point of the jaws, the ribs on one jaw being between the ribs on the other jaw.

6. A machine of the class described, comprising gripper jaws provided with cooperating gripping surfaces having therein depressions extending only partially through the thickness of the jaws, the lateral edges of which depressions converge toward the point of the grippers to cause compression of the stock laterally if it slips between the jaws, said depressions becoming shallower toward the point of the grippers to cause vertical compression of stock which slips.

7. A machine of the class described comprising gripper jaws one of which has a gripping surface provided with a groove with teeth in it and the other of which is formed to force the stock into the groove upon the teeth.

8. A machine of the class described comprising gripper jaws having on their gripping faces gripping areas provided with fluted formations, said areas converging toward the line along which the material is tensioned by the grippers.

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

ARTHUR L. RUSSELL.

Witnesses:

FREDERICK L. EDMANDS,  
HERBERT W. KENWAY.