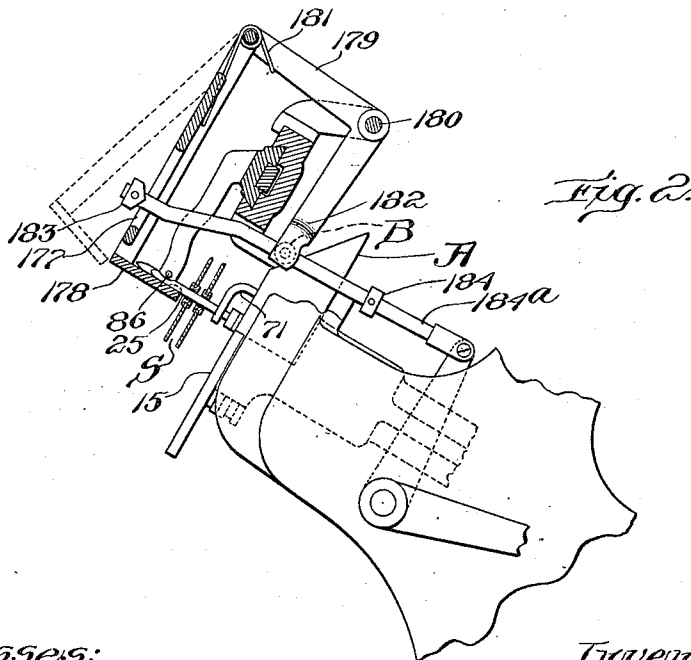
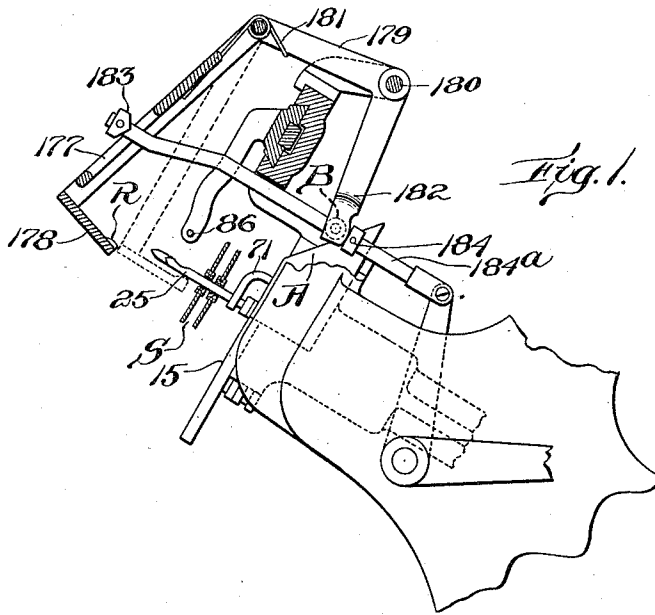


C. S. WELLS & W. W. DARNILL.
MACHINE FOR LACING UPPERS.
APPLICATION FILED AUG. 7, 1909.

1,030,553.

Patented June 25, 1912.

2 SHEETS-SHEET 1.



Witnesses:
A. C. Richardson
A. Vickroyd

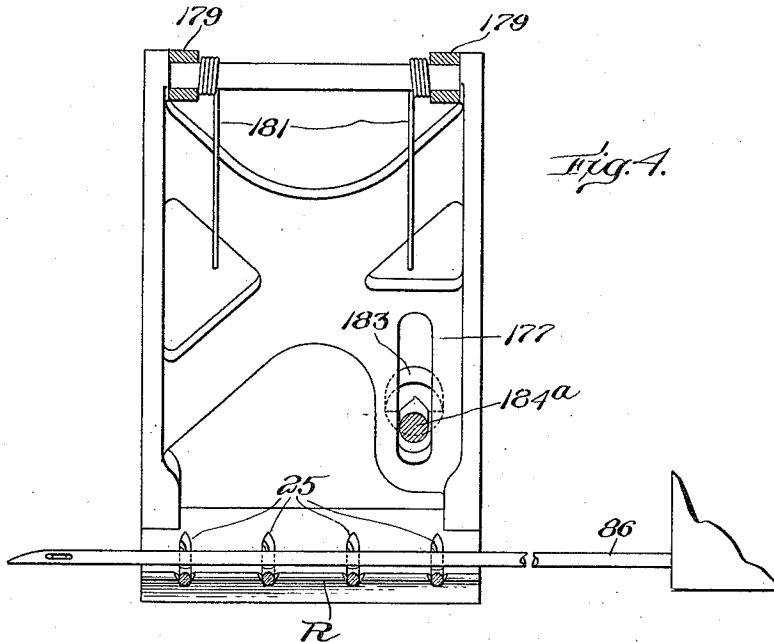
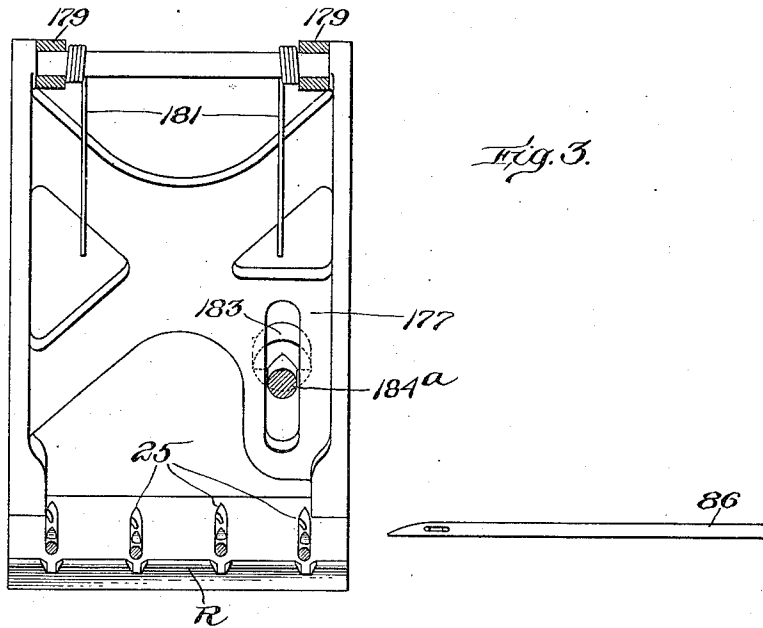
Inventors
Charles S. Wells,
Walter W. Darnill
by
Phillips Van Eeren & Fish
Attys.

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by Walter W. Darnill
Phillips Van Everen & Fish
Attys.

UNITED STATES PATENT OFFICE.

CHARLES STONEHALL WELLS AND WALTER WILFRID DARNILL, OF LEICESTER, ENGLAND, ASSIGNORS TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR LACING UPPERS.

1,030,553.

Specification of Letters Patent.

Patented June 25, 1912.

Application filed August 7, 1909. Serial No. 511,732.

To all whom it may concern:

Be it known that we, CHARLES S. WELLS and WALTER W. DARNILL, subjects of the King of Great Britain, residing at Leicester, in the county of Leicester, England, have invented certain new and useful Improvements in Machines for Lacing Uppers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable other skilled in the art to which it appertains to make and use the same.

The present invention relates to machines for lacing together the eyeleted quarters of boot and shoe uppers preparatory to placing them on the last for the lasting and other subsequent operations.

The invention is particularly applicable to shoe upper lacing machines of the kind shown and described in application No. 296,388, filed January 16, 1906, which has matured into patent No. 962,105, June 21, 1910, although it is not limited in its application to this form of machine, but may be embodied with advantage in other forms of machines, the specific construction and arrangement of the various parts being varied or modified as found desirable or best suited to the form of machine in which the invention is embodied. The machine shown and described in said application comprises a plurality of looper needles and means co-operating therewith to form a series of loops in the lacing cord and retain them in position until the shoe upper is placed upon the needles, and also comprises a cord feeding needle acting to place the lacing cord in position to be engaged by the looper needles and to thereafter pass a portion of the cord through the loops after they have been passed through the eyelet holes of the upper. In operating upon the heavier classes of work, it has been found that owing to the stiffness and shape of the upper the looper needles are liable to be bent or sprung out of their normal position when they are inserted in the eyelet holes of the uppers, so that they do not coöperate properly with the cord feeding needle or with other of the co-operating parts of the machine.

It is one of the objects of the present invention to overcome this difficulty and in-

sure the accurate positioning of the looper needles with relation to the cord feeding needle.

To this end one feature of the invention contemplates the provision in an upper lacing machine provided with looper and cord feeding needles, of needle positioning means by the operation of which, either automatically or otherwise, a displaced looper needle or needles may be returned into position to properly coöperate with the cord feeding needle (or other coöperating element of the machine). The specific construction and arrangement of the needle positioning means is not material to the broad scope of the invention, and may be varied or modified without departing therefrom. It is preferred, however, to so construct and arrange the needle positioning device that the needle or needles will be forced into position to properly coöperate with the cord feeding needle or other element in the machine by relative movement of the needles and positioning device transversely of the needles, and this construction and arrangement constitutes a further feature of the invention. In accordance with this feature of the invention, the needle positioning device may operate only upon such needles as are displaced, or the construction and arrangement may be such that under normal conditions the needles will be bent by the positioning device into proper position to coöperate with the cord feeding needle or other element of the machine.

The machine shown and described in the application above referred to is provided with a work adjuster for positioning the work upon the looper needles which at certain times during the operation of the machine is in close proximity to the looper needles, and in embodying the present invention in this machine, it is preferred for the sake of simplicity to so form and operate the work adjuster that it will also act as a needle positioning device for engaging the looper needles and forcing them into proper position to coöperate with the cord feeding needle.

The various features of the invention will be readily understood from an inspection of the accompanying drawings, in which the

preferred form of the invention is shown embodied in the machine of the application above referred to.

In the drawings, Figure 1 is a side elevation, partly in section, of that portion of the machine which contains the work adjuster and most of its actuating mechanism, and shows the adjuster in position to permit the work to be placed on the needles; Fig. 2 is an elevation similar to Fig. 1, but showing the adjuster pressing the work on the needles; Fig. 3 is an elevation of the work adjuster as it is seen from the right of an observer of Fig. 1, showing the looper needles bent; and Fig. 4 is an elevation similar to Fig. 3, showing the looper needles straightened and the cord feeding needle in cord feeding position.

The machine shown in the drawings is the same in general construction and mode of operation as the machine shown and described in the application above referred to, and is provided with a series of looping needles 25 and cooperating looper fingers 71 for forming a series of loops in a lacing cord and holding them in position to be passed through the eyelet holes of the upper. The looper needles are mounted upon a carrier 15 which is moved longitudinally and transversely of the needles in the operations of forming loops of lacing cord upon the needles and passing a portion of the cord through the loops after they have been passed through the eyelet holes of the upper.

The work adjuster or presser which forces the work into position upon the looper needles comprises a main member 177 from which a projection or plate 178 extends toward the looper needles. The member 177 is pivoted upon the supporting arms 179 which are keyed to a shaft 180 fulcrumed upon a bracket secured to the machine frame. A spring 181 surrounding the pivot pin between the main member and the supporting arm acts to force the member outwardly or away from the looper needles. The shaft 180 is provided with a depending arm 182 which with the supporting arm 179 constitutes a bell crank lever. The lower end of the depending arm 182 lies in front of a contact collar 184 fixed upon an operating rod 184^a which extends through a slot in the main member. The operating rod is moved endwise by connections from the starting treadle of the machine.

When the machine is at rest the work adjuster 177 is held raised and away from the needles by the spring 181 that surrounds its pivot pin and by the engagement of the contact collar 184 on the operating rod with the depending arm 182. The upper S is placed upon the looper needles upon which the loops of cord have been formed in the previous operation of the machine and then the starting treadle is depressed. This moves

the operating rod 184^a inwardly and permits the supporting arms 179 to descend by the reaction of the spring 181 and their own weight until the work adjuster is in front of the work on the needles. Continued inward movement of the operating rod will cause a collar 183 on its outer end to engage the work adjuster and swing it inwardly until the plate or projection 178 on the main member 177 of the adjuster strikes the work and positions it correctly upon the needles. The starting treadle now reaches its lower limit and throws the machine into operation. The carrier of the looper needles is next raised to bring the needles into position to receive a portion of the locking cord through the loops on the needles; the cord being passed through the loops by a cord feeding needle 86 that travels in a path that is transverse to the direction in which the looper needles extend.

In order that the work adjuster 177 may be stopped in cooperative position opposite to the looper needles and accompany them in their upward movement, the carrier of said needles has a cam A mounted upon it which engages a roller B carried upon the depending arm 182 of the bell crank lever that supports the adjuster. If desired, the cam A may be so mounted that its position can be adjusted. By the action of this cam the depending arm 182 is moved outwardly and the supporting arms 179 upwardly thus raising the work adjuster.

When a stiff upper is placed upon the needles and its eyelets do not exactly register with the needles, these latter are frequently sprung out of the plane in which they should lie, and consequently the cord feeding needle 86 is liable to foul one or more of the looper needles or to fail in passing the cord through one or more of the loops on the looper needles. To overcome this defect the cam A on the carrier of the looper needles is so shaped that it imparts to the work adjuster a movement that is in excess of that given to the needle carrier so that the projection or plate 178 on the main member of the adjuster engages the looper needles and returns them (if they have been deflected by the stiff upper) into the plane in which they should lie to cooperate properly with the cord feeding needle 86 in the passing of the locking cord through the loops upon them. Or in the case of very thin needles the plate may have a still further movement to slightly deflect all the needles to bring them into alinement with the threading or cord feeding needle. The end of the plate 178 may be provided with a projection or rib R to engage the needles. This may be a plain rib or may be notched where it contacts with the needles so that it will position the needles transversely.

While it is preferred to employ the con-

struction and arrangement of devices shown and described in embodying the invention in a machine such as shown in the application above referred to, it will be understood that this specific construction and arrangement is not material except so far as it is set forth in the claims, and that any suitable means for returning the needles into the position from which they have been deflected by a stiff upper or otherwise may be employed without departing from the invention.

Having explained the nature and object of the invention, and specifically described one form in which it may be embodied, what we claim is:—

1. A machine for lacing uppers, having, in combination, looper needles, means co-operating therewith to insert a lacing in the eyelet holes of an upper, and means for returning a displaced needle to normal position with relation to the coöperating means, substantially as described.

2. A machine for lacing uppers, having, in combination, looper and cord feeding needles, and means for returning a displaced looper needle into position to coöperate with the cord feeding needle, substantially as described.

3. A machine for lacing uppers, having, in combination, looper needles, means co-operating therewith to insert a lacing in the eyelet holes of an upper, and means for bending the looper needles into coöperative relation to said means, substantially as described.

4. A machine for lacing uppers, having, in combination, looper and cord feeding needles, and means for bending the looper needles into coöperative relation to the cord feeding needle, substantially as described.

5. A machine for lacing uppers, having, in combination, looper needles, and a needle positioning device relatively movable transversely of the needles to force the needles into a predetermined position, substantially as described.

6. A machine for lacing uppers, having, in combination, a cord feeding needle, looper needles, and a needle positioning device relatively movable transversely of the needles for forcing the looper needles into coöperative relation to the cord feeding needle, substantially as described.

7. A machine for lacing uppers, having, in combination, looper needles, a carrier therefor, a needle positioning device arranged to engage the needles on the side of the work opposite to that on which the needles are supported by the carrier, and means for relatively moving the needles and needle positioning device transversely of the needles to force the needles into a predetermined position, substantially as described.

8. A machine for lacing uppers, having, in combination, looper needles, a work adjuster, and actuating means for moving the adjuster longitudinally of the needles to adjust the work thereon and transversely of the needles to force the needles into a predetermined position, substantially as described.

9. A machine for lacing uppers, having, in combination, a cord feeding needle, looper needles, a work adjuster, and actuating means for moving the adjuster longitudinally of the needles to adjust the work thereon and transversely of the needles to bring them into coöperative relation with the cord feeding needle, substantially as described.

10. A machine for lacing uppers, having, in combination, looper needles, a carrier therefor, a needle positioning device arranged to engage the needles on the side of the work opposite to that on which the needles are supported by the carrier, and means for actuating the needle positioning device to bring the needles into a predetermined position, substantially as described.

11. A machine for lacing uppers, having, in combination, looper needles, a needle positioning device, and means for actuating the device to force the needles laterally into a predetermined position, substantially as described.

12. A machine for lacing uppers, having, in combination, a cord feeding needle, looper needles, and a needle positioning device for engaging the needles and positioning them in coöperative relation to the cord feeding needle, substantially as described.

CHARLES STONEHALL WELLS.
WALTER WILFRID DARNILL.

Witnesses:

ARTHUR ERNEST JERRAM,
ELEANOR PYWELL.