G. LEWIS.

METHOD OF LACING OR FASTENING BOOT AND SHOE UPPERS.

APPLICATION FILED NOV. 22, 1913.

1,161,871.

Patented Nov. 30, 1915.

2 SHEETS—SHEET 1.

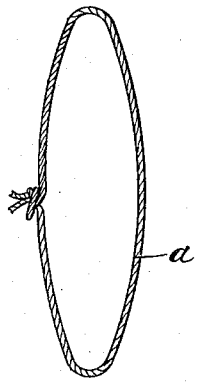


Fig. 1.

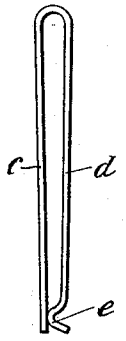


Fig. 2.

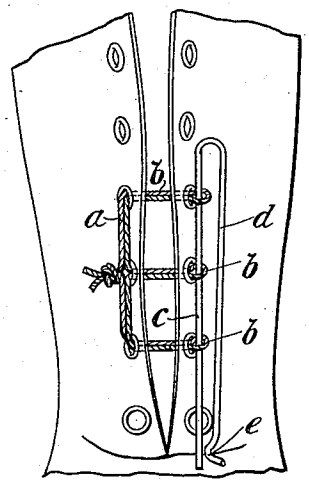


Fig. 3.

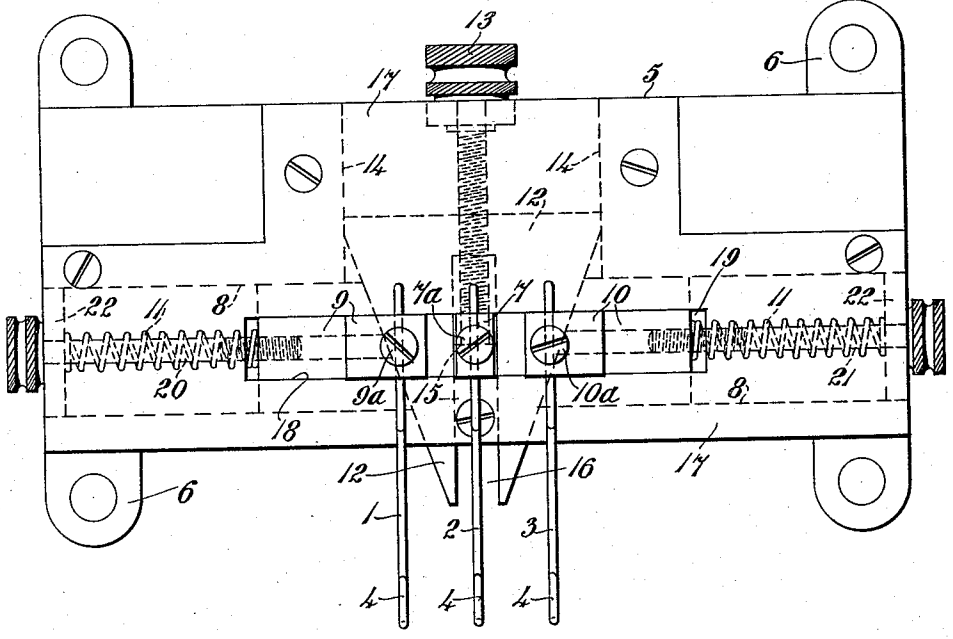


Fig. 4.

Witnesses.
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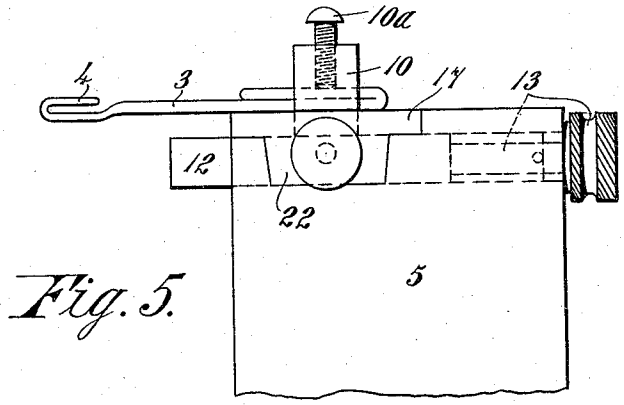


Fig. 5.

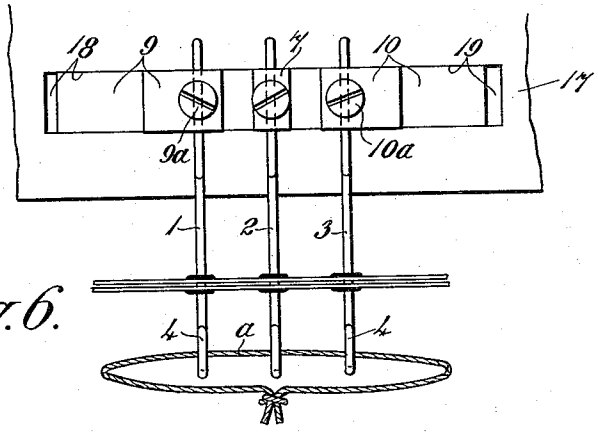


Fig. 6.

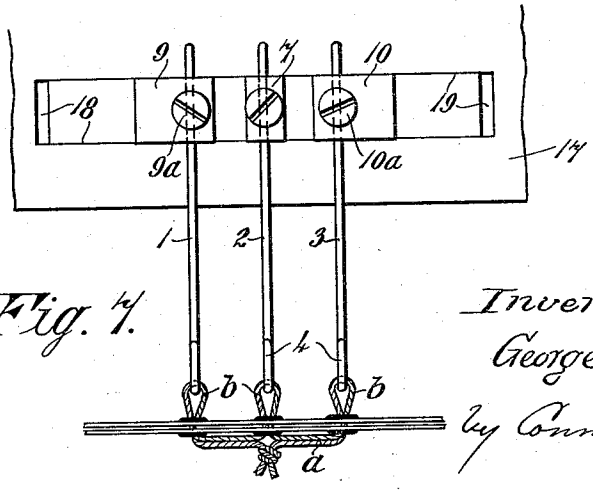


Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE LEWIS, OF NORTHAMPTON, ENGLAND.

METHOD OF LACING OR FASTENING BOOT AND SHOE UPPERS.

1,161,871. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed November 22, 1913. Serial No. 802,488.

To all whom it may concern:

Be it known that I, GEORGE LEWIS, a subject of the King of Great Britain, residing at Northampton, in the county of Northampton, England, have invented certain new and useful Improvements in Methods of Lacing or Fastening Boot and Shoe Uppers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a new or improved device for and method of lacing or fastening boot and shoe uppers during the process of manufacture.

It is customary, during the process of manufacture of boots and shoes, to fasten the fronts of the uppers together at one or more places for the purpose of keeping them closed, and more particularly when the boot or shoe is being lasted, to enable the upper to be drawn tightly down to the last and at the same time retain the original lines of the upper pattern. This fastening is usually effected by the insertion of a lace, rigid metal hook, or string or cord through the eyelets in the edges of the upper.

The present invention comprehends a new or improved method of and means for securing boot and shoe uppers in the manner above mentioned, such method and means being of simple character and operation, and which will not injure the eyelets, and will enable the upper to be readily fastened, and instantaneously unfastened when required, and will also allow the upper to fit down to the last no matter whether instep of last be wide or narrow.

The device of this invention is adapted to deal with uppers of various shapes and with eyelets of any size, and may be readily adjusted to suit variations in the length of spacing of eyelets.

According to this invention there is employed a length of cord or other lacing material, a device for threading said cord through the eyelets of the upper to be fastened, and a hook or other suitable member to secure the cord in position when threaded through the eyelets.

The method adopted consists in using a length of woven thread, cord or the like (preferably formed by tying or otherwise into an endless loop, as and for a purpose hereinafter described) the said thread or cord being applied to the boot or shoe upper by drawing it through a suitable number of corresponding eyelets on each side of the upper, the cord being drawn through said eyelets in the form of loops from one side of the boot or shoe to the other. After being drawn through the eyelets in the two edges of the upper as described, a hook, rod or other suitable locking device is passed through the ends of the loops which are thereby prevented from being pulled out.

It will be understood that a separate loop of the lace or fastening cord is drawn through each pair of corresponding or coinciding eyelets in the edges of the upper and that the device for securing said loops passes through all of them. Upon withdrawal of the locking hook or the like from the loops the fastening lace or cord may be pulled out to unfasten the upper.

For the purpose of drawing the loops of the fastening lace or cord through two or more of the lacing eyelets of the boot or shoe upper, a device or apparatus is provided comprising a plurality of members adapted and arranged for a number of the eyelets to be passed thereon, and to engage each a portion of the lacing cord so that when the upper is drawn off said members, the latter will each draw a loop of the fastening lace or cord through the eyelet which is drawn off it.

These threading members conveniently consist of needles provided at their end with a hook to engage the fastening cord. The threading needles are arranged in a suitable carrier and provision is made whereby they may be relatively adjusted to accommodate uppers having different lengths of eyelet spacing.

In order that the invention may be clearly understood reference will be made in the following further description to the accompanying drawings which illustrate a practical example of the manner in which the invention may be carried into effect.

In the drawings referred to:—Figure 1 represents a loop of cord to be used for fastening a boot upper. Fig. 2 shows a convenient form of locking pin. Fig. 3 represents a boot upper laced or fastened according to the method included in this invention. Fig. 4 is a plan of a threading device. Fig. 5 is a side view of same. Figs. 6 and 7 are

plan views showing the method of threading the eyelets of the upper by the device of Figs. 4 and 5.

Like parts are designated by the same reference characters in those figures where they are repeated.

The method of lacing involved consists in using a loop *a*, of cord or the like such as shown in Fig. 1, and drawing it through coinciding eyelets in the sides of the upper in the form of loops *b*, in the manner represented in Fig. 3, a locking pin *c*, being then passed through the loops *b*, between their ends and the outside of the upper, which pin serves to prevent the withdrawal of the loops *b*. The fastening pin *c*, conveniently consists of a wire loop having one side approximately straight and adapted, as shown in Fig. 3, to constitute a bolt when passed through the ends of the loops *b*, as aforesaid. The other side *d*, of the wire loop forms a spring bow the end *e*, of which makes contact with the aforesaid straight side *c*, and serves to prevent the accidental withdrawal of the hook from the loops *b*. The contacting end *e*, of the spring bow *d*, is bent outward as shown in Fig. 2 to enable the pin *c* to be forcibly passed through and withdrawn from the loops when required. By using the lace or fastening cord in the form of an endless loop such as *a*, the same is prevented from being pulled right through the eyelets when the individual loops *b*, are drawn through from one side of the boot to the other, with the result that when in use, the lace or cord holds one side of the upper closed by reason of its being endless in form (as shown at the left hand side of Fig. 3) while the other side of the upper is held by the ends of the loops *b*, being secured on the outside thereof by the fastening pin *c*, the individual loops *b*, extending from one side of the upper to the other and through the corresponding eyelets in each. Obviously, instead of using the fastening cord in the form of an endless loop such as previously described, it may be provided at each end with a button or some similar means or a knot to prevent the ends drawing through the eyelet holes. The endless loop is however more convenient as it automatically adjusts itself to give the effective length of fastening required.

In dealing with a number of boots of the same size and kind it is desirable that the uppers of each should be fastened together to the same extent and in order that the fastening loops *a*, used shall be of the same length, such loops may be formed by tying the fastening lace or cord around a block of the size required, or two or more fingers, pins or the like set to the required distance apart. By forming all the endless loops on this block or other means, they may all be made the same definite length. The block or other means may be adjustable for making loops of the different lengths which may be required.

The ends of the fastening lace or cord may be secured together to form the endless loop otherwise than by tying if desirable, as for instance by means of a tag or clip or by some such auxiliary device.

The device for performing the threading operation comprises a plurality of needles 1, 2, 3, (Fig. 4) each provided at its operative end with a hook 4 (Fig. 5) to receive the fastening cord. These needles are adapted for the upper to be passed thereon as will be described later.

According to a concrete form of the threading device, illustrated in Figs. 4 and 5 of the drawings, the needles 1, 2, 3, are mounted upon a block 5 adapted for attachment to a bench or other support such for instance as by the lugs 6 through which suitable holding means may be passed. The central needle 2 is clamped in a fixed block 7 by a screw 7^a. Movable to and fro along guideways 8 in the block 5 are blocks 9 and 10—one on each side of the fixed block 7—these blocks carrying the needles 1 and 3 respectively which are clamped in position by screws 9^a, and 10^a. The movable blocks 9 and 10 are pressed toward the fixed block 7 by springs 11 and are simultaneously adjustable relatively to said fixed block to vary the spacing between the three needles by means of a transversely slidable wedge 12 which engages said movable needle blocks and is moved between same by a rotary screw 13. It will be understood that the springs 11 and wedge 12 coöperate to effect the beforementioned adjustment of the needle blocks 9 and 10, that is to say the needle spacing is increased by an outward movement of the wedge 12 which moves the blocks 9 and 10 against the action of the springs 11, while the needle spacing is decreased by an inward movement of the wedge 12 the spring 11 pressing the blocks 9 and 10 against the sides of the wedge.

The wedge 12 is guided in its movements by the sides 14 of a guideway in the block 5, and also by a projection 15 on the block the wedge 12 being bifurcated centrally at 16 to embrace said projection. The blocks 9 and 10 and the wedge 12 are prevented from upward displacement from their guideways in the block 5 by a corner plate 17 which is slotted at 18 and 19 for the reduced parts of the blocks 9 and 10 to project through and move along.

By means of the adjusting means just described the needles 1 and 3 are adjusted equally in relation to the intermediate needle 2 but by means of screw threaded rods 20, 21, an unequal adjustment of the movable blocks 9, 10, may be effected if desired, or by means of these rods the inward relative

movement of the blocks 9 and 10 may be restricted to give a desired minimum needle spacing. The rods 20, 21, are screw threaded into the blocks 9 and 10, and are slidable through bearings 22 on the block 5.

In a variation of the constructional form shown, the movable needle carrying blocks 9, 10 may be formed to engage or be engaged by the coöperating wedge 12 so that the latter will actuate the blocks in both directions thus eliminating the use of the before mentioned springs 11. One manner of effecting this may consist in providing undercut grooves in the slide or block which grooves are engaged by projections on the blocks or slide.

By increasing the number of movable needle carrying blocks and the number of inclined faces on the actuating slide a device such as that hereinbefore described may have more than three needles (for example it might have four or five) these being adjustable in the manner set forth so that they may be spaced to suit the pitch of the eyelets in the upper. When, as just mentioned, more than three needles are provided, the adjusting means are constructed to move the needles so that they always bear the same ratio.

In using the device the needles are adjusted so that their spacing corresponds with the spacing of the eyelets in the boot upper to be threaded. The eyelets in the sides of the upper which are to be threaded are placed upon the needles 1, 2, 3 the coinciding or corresponding eyelets in the two sides of the upper being placed upon the same needles in the manner shown in Fig. 6. After the upper has been placed on the needles—the latter penetrating the eyelets—the fastening loop *a*, is placed in the hooks 4 and then the upper is drawn off, whereupon each needle 1, 2, 3 holds a loop *b* of the cord which loops consequently extend through the eyelets as shown in Fig. 7. The fastening pin *c* may be passed through the ends of the loops *b* either before or after the latter are removed from the hooks 4.

To facilitate the withdrawal of the eyelets from the threading needles, the hooks of the latter may have pivoted latches or guards (not shown) combined therewith which will close or guard the open hook and prevent the latter catching the eyelets. Such latches may or may not be spring controlled.

Instead of the hooks at the ends of threading members other suitable means such as clips may be used to engage the lace or cord for the purpose of drawing it through the eyelet.

It may be necessary, in order to accommodate the threader device to the curvature of some uppers, to adjust the threader needles transversely *i. e.* so that they may form a curved row instead of straight. This may be provided for in a convenient manner, for example the needles may be inserted in different holes in the carrying blocks, or the latter may be capable of adjustment by screwing, or bent or cranked needles may be used.

Instead of the locking pin heretofore described, a pin or bolt having a head at one end might be used, the said bolt or pin having combined therewith a cord or an expansible opposite end or some device for attachment to its opposite end to prevent its withdrawal from the loops through which it passes.

What I claim then is:—

1. The herein described method of fastening the two sides of a boot or shoe upper, which consists in forming an endless loop of flexible cord, doubling the same at intervals into shorter loops, passing the latter through the coinciding eyelets on opposite sides of the upper, and inserting a wire fastening pin through the protruding ends of said short loops, substantially as described.

2. The herein described method of fastening the two sides of a boot or shoe upper, which consists in the forming of a length of flexible cord into an endless loop, forming in the loop a plurality of shorter loops, drawing the shorter loops through the coinciding eyelets of the opposite sides of the upper and securing said short loops from withdrawal, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE LEWIS.

Witnesses:
E. N. Lewis,
George Lester.

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