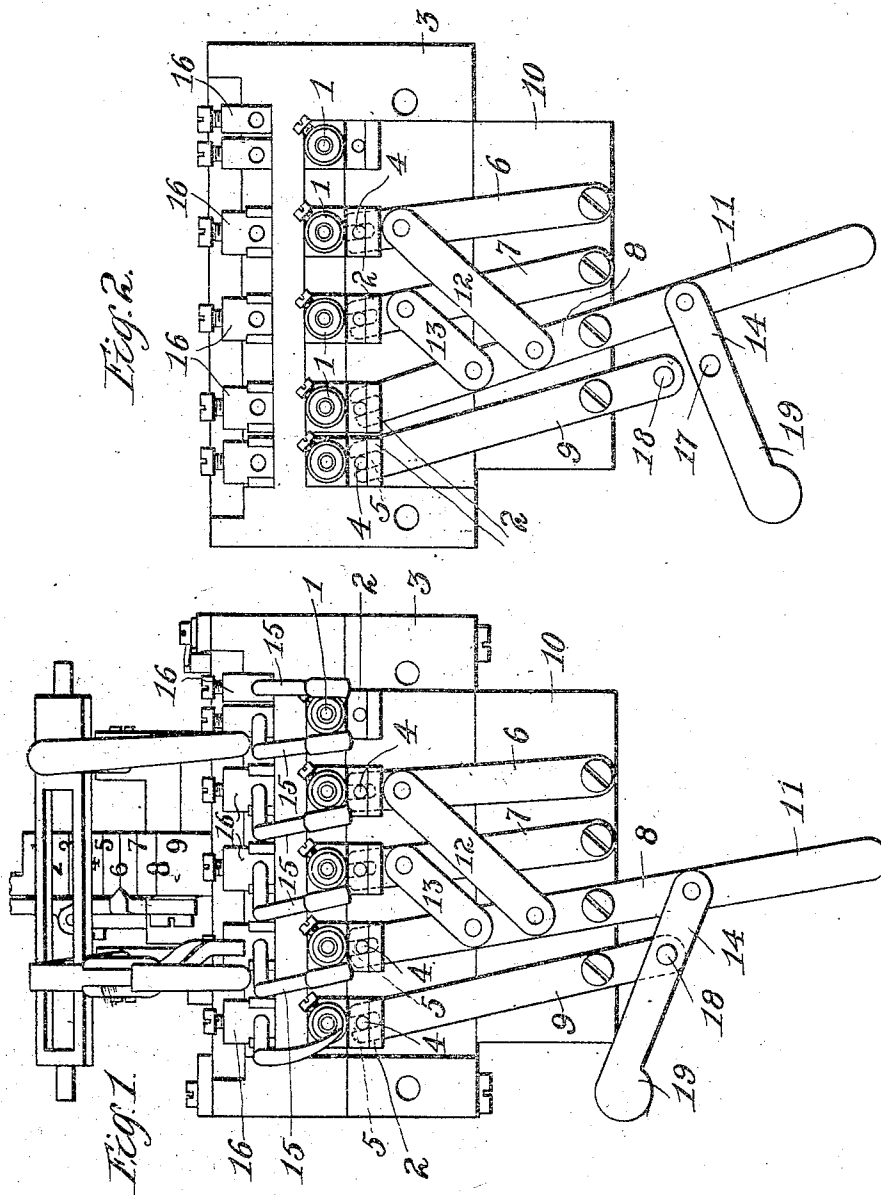


H. E. ENSLIN.
UPPER LACING MACHINE.
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Witnesses
Wm. M. Rheem
H. D. McPhail

Inventor
Herbert E. Enslin
by Phillips Van Euren Fresh
attys.

UNITED STATES PATENT OFFICE.

HERBERT E. ENSLIN, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

UPPER-LACING MACHINE.

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To all whom it may concern:

Be it known that I, HERBERT E. ENSLIN, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Upper-Lacing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to that class of upper lacing machines in which a series of loops of lacing cord are held by a series of needles or spindles and cooperating loopers in position to be passed through the eyelet holes of the upper, and more particularly to the devices for spacing the spindles in accordance with the spacing of the eyelet holes in the upper to be laced. In this type of machines the spindles have usually been secured in a series of carrier blocks which may be adjusted laterally to vary the spacing of the needles, and devices have been provided for simultaneously adjusting the blocks. The spacing of the spindles may be increased until the end spindle reaches the limit of its movement, when further increase in the spacing is prevented by the arrest of the end block. It is frequently desirable to use a machine to insert lacing in a number of eyelets less than the number of spindles with which a machine is provided. For instance, machines provided with five spindles may frequently be used for inserting lacing in but four eyelets. In such case it is sometimes desirable that the spacing of the four spindles which are to be used be increased beyond that which can be secured when using the full number of spindles.

It is accordingly the object of the present invention to provide novel and improved means for simultaneously adjusting the spindle carriers which will enable the spacing of the spindles to be increased in case the number of loops of lacing to be inserted by the spindles is less than the number of spindles with which the machine is provided.

To this end the invention contemplates the provision in an upper lacing machine provided with a series of spindle carriers for inserting loops in the eyelet holes of the upper, of devices for simultaneously adjust-

ing the spindle carriers in accordance with the spacing of the eyelet holes in the upper to be laced, having provision for disconnecting a spindle carrier at the end of the series to permit increased spacing of the remaining spindle carriers. With this construction the spindle carrier at the end of the series may be moved to the limit of its movement and then disconnected from the adjusting means so that the next adjacent spindle carrier becomes the end carrier of the active series, and the spacing of the active spindles may be increased until this carrier brings up against the inactive carrier.

The invention will be readily understood from an inspection of the accompanying drawings and the following detailed description of the mechanism illustrated therein.

In the drawings, Figure 1 is a front elevation of the spindle carrying head of an upper lacing machine embodying the invention, the front plate which normally covers the spindle adjusting devices being removed, and Fig. 2 is a similar view, the spindles, loopers and certain other parts being removed.

In the drawings the invention is illustrated as embodied in an upper lacing machine having the same general construction and mode of operation as the upper lacing machine shown and described in the patent to Smith, No. 962,105, June 21, 1910.

As shown in the drawings, the spindles 1 are secured in spindle carrier blocks 2 which are mounted in guideways formed in the front of a carrier head 3 so that the blocks may be adjusted to vary the spacing of the spindles. The block shown at the right is secured in fixed position, while the others are mounted to slide laterally in the head 3 in changing the spacing of the spindles. The adjustable blocks are provided with pins 4 engaging slots 5 in the upper ends of a series of levers 6, 7, 8 and 9 which are pivoted to a plate 10 depending from the head 3. The lever 8 is extended to form a handle 11 which may be manipulated by the operator in adjusting the spindle carrier blocks. The levers 6 and 7 are connected to the lever 8 by links 12 and 13, and the lever 9 is connected to the lever 8 by a link 14. The connections between the spindle carrier blocks are such that the blocks will be moved

varying distances by movement of the handle 11 and the equal spacing of the blocks will be maintained whatever the adjustment of the blocks. The loopers 15 which cooperate with the spindles in forming and holding the loops are secured in laterally adjustable blocks 16, those looper carrying blocks which correspond to the movable spindles being connected to the movable spindle carrying blocks so that they will move in unison therewith. In the construction shown there are five spindle carrying blocks, and in case loops of lacing cord are to be inserted in five eyelet holes the spindle adjusting devices will be connected, as indicated in Fig. 1, so that the four spindle blocks at the left will be moved simultaneously and in such manner as to maintain an equal spacing of the spindles when the spindle blocks are adjusted to secure a spacing of the spindles corresponding to the spacing of the eyelet holes in the upper to be laced. In case the machine is to be used for inserting loops of lacing cord in but four eyelet holes, the spindle and cooperating looper may be removed from the carrier blocks at the left of the series, and these carrier blocks disconnected from the adjusting devices to enable the spacing of the remaining spindles and loopers to be increased. Provision for thus disconnecting the spindle carrier block at the end of the series from the adjusting devices is made in the construction shown by forming the link 14 of spring metal so that it may be sprung toward or away from the lever 9, and providing the link with a hole 17 adapted to fit over a pin 18 on the lower end of the link 9. To enable the link 14 to be readily engaged with or disengaged from the pin 18 the link is extended to form a handle 19. When the link is disengaged from the pin 18 it may be swung down so that it overlies and is parallel with the adjusting handle 11. When the link is disconnected the spindle carrying block 2 at the left of the series may remain in its extreme left-hand position, as indicated in Fig. 2, and the spacing of the remaining spindles may be increased until the further movement of the block at the upper end of the lever 8 is prevented by its engagement with the block at the left of the series. This enables

a greater spacing of the spindles when using less than the full number with which the machine is provided than can be secured with all the movable spindle carriers permanently connected to the adjusting devices, with a resulting increase in the variety of work which may be done upon the same machine.

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

1. An upper lacing machine, having, in combination, a series of spindle carriers and means for simultaneously adjusting the spindle carriers having provision for disconnecting one of the carriers to permit increased spacing of the remaining carriers, substantially as described.

2. An upper lacing machine, having, in combination, a series of spindle carriers, a series of looper carriers, means for simultaneously adjusting the spindle and looper carriers in accordance with the spacing of the eyelet holes in the upper to be laced including means for disconnecting the carriers at the end of the series to permit increased spacing of the remaining carriers, substantially as described.

3. An upper lacing machine, having, in combination, a plurality of spindle carriers, a series of adjusting levers connected to the carriers, links connecting the levers to maintain an equal spacing of the carriers having provision for disconnecting the lever at the end of the series to permit increased spacing of the remaining spindle carriers, substantially as described.

4. An upper lacing machine, having, in combination, a carrier head 3, a series of spindle carrier blocks 2 mounted for lateral adjustment in the head, a series of levers having their upper ends connected to the blocks, links connecting the levers to secure an equal spacing of the blocks, the link connecting the lever for the end block having provision for disconnecting it from the lever, substantially as described.

HERBERT E. ENSLIN.

Witnesses:

O. BLACHE HARGRAVES,
ELIZABETH C. COUPE.