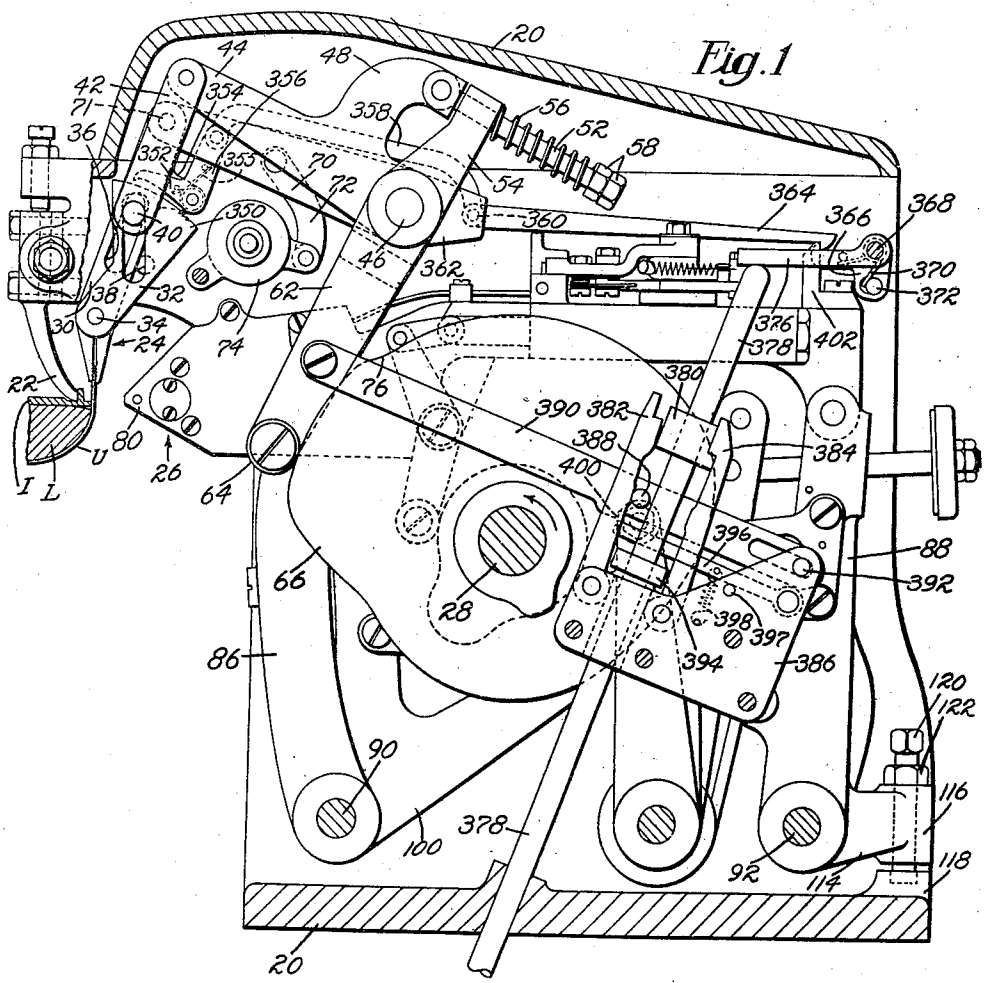
Dec. 9, 1947. R. H. LAWSON 2,432,165

SHOE LASTING MACHINE

Original Filed March 14, 1945 4 Sheets-Sheet 1

Fig. 1



Inventor

Robert H. Lawson

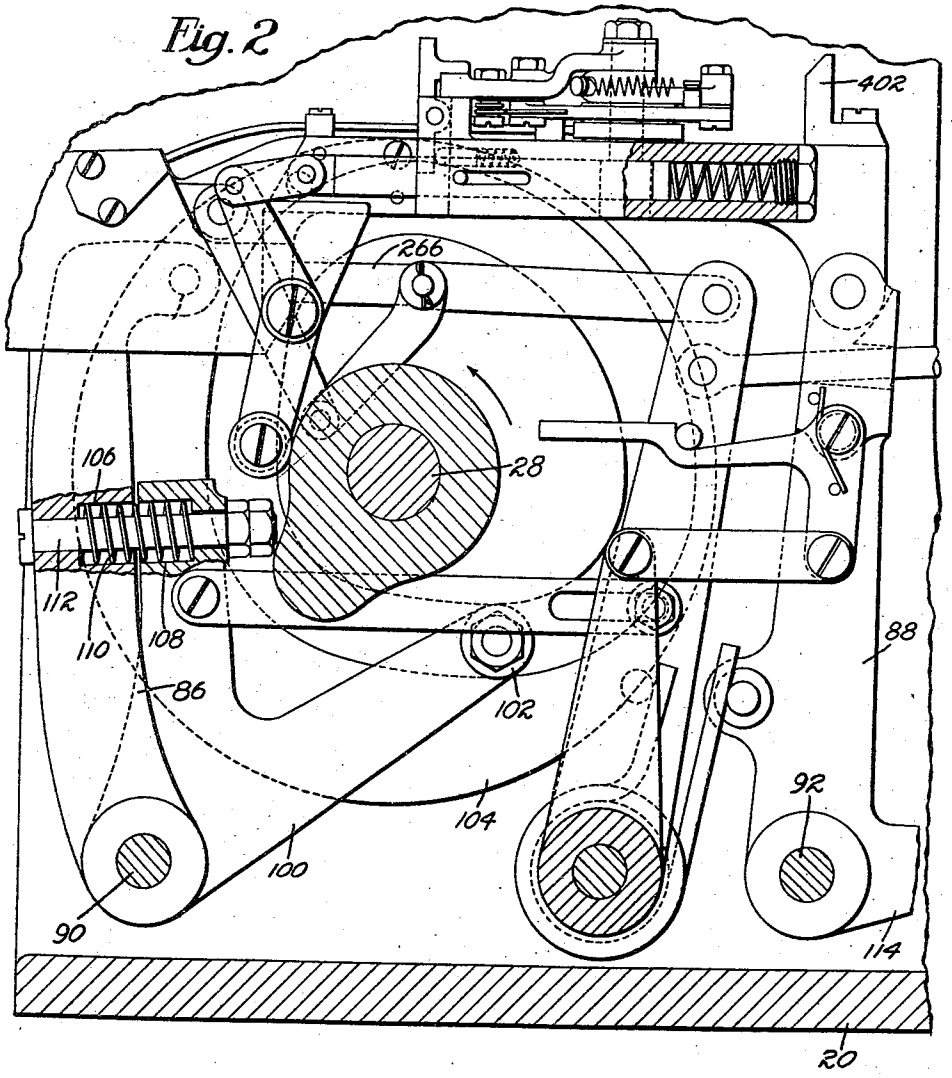
By his Attorney

Dec. 9, 1947. R. H. LAWSON 2,432,165

SHOE LASTING MACHINE

Original Filed March 14, 1945 4 Sheets-Sheet 2

Fig. 2



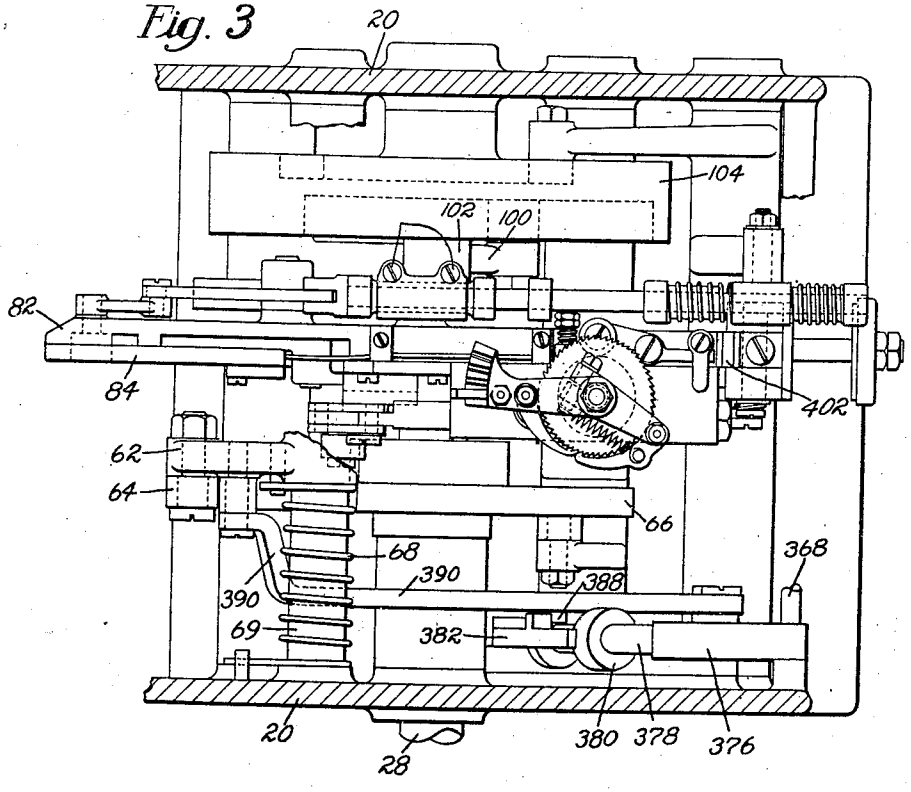
Inventor
Robert H. Lawson
By ~~his Attorney~~

Dec. 9, 1947. R. H. LAWSON 2,432,165

SHOE LASTING MACHINE

Original Filed March 14, 1945 4 Sheets-Sheet 3

Fig. 3



Inventor
Robert H. Lawson
By his Attorney

Dec. 9, 1947. R. H. LAWSON 2,432,165

SHOE LASTING MACHINE

Original Filed March 14, 1945 4 Sheets-Sheet 4

Fig. 4

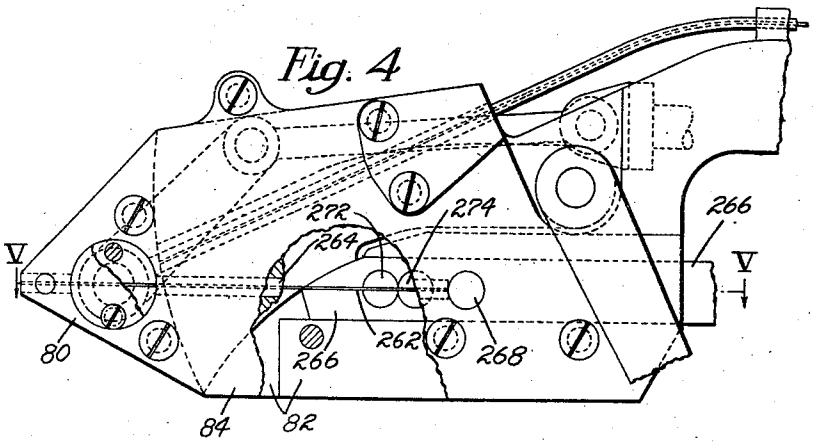


Fig. 5

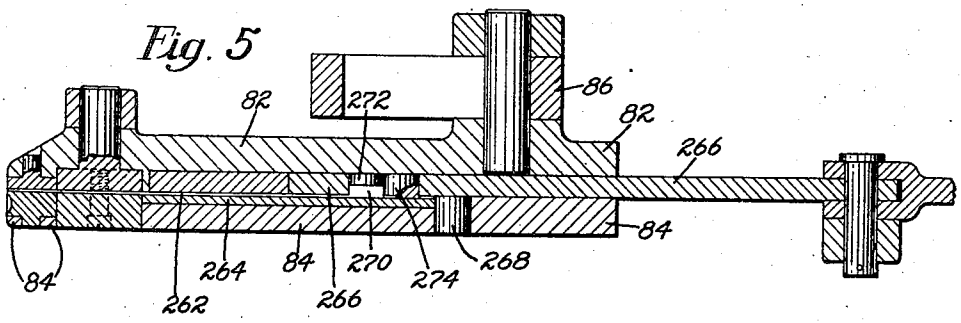
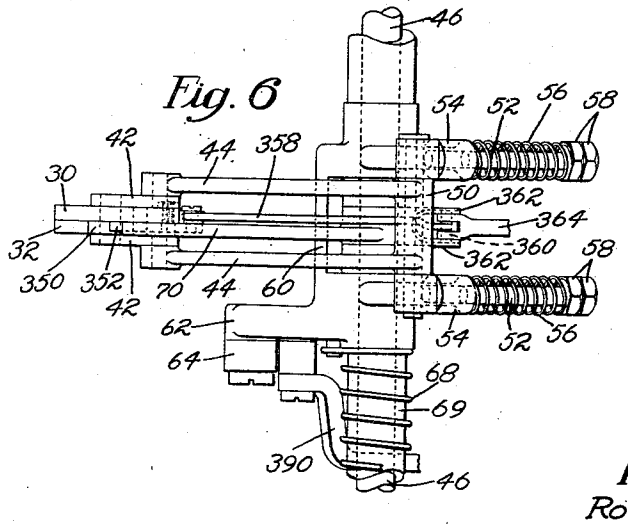


Fig. 6



Inventor

Robert H. Lawson

By his Attorney

Patented Dec. 9, 1947 2,432,165

UNITED STATES PATENT OFFICE

2,432,165

SHOE LASTING MACHINE

Robert H. Lawson, Beverly, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Original application March 14, 1945, Serial No. 582,647. Divided and this application May 7, 1946, Serial No. 667,843

6 Claims. (Cl. 12—2)

1

This invention relates to shoe lasting machines and is herein illustrated as applied to a welt shoe lasting machine of the type disclosed in an application for United States Letters Patent Serial No. 582,647, filed March 14, 1945, of which this application is a division.

Shoe lasting machines of the above identified type usually comprise a lasting gripper adapted to tension a shoe upper over a last, and a fastening inserting mechanism, including a throat member, adapted to wipe the marginal portion of the tensioned upper into lasted relation to a sole member on the last bottom and thereafter to secure the marginal portion of the upper in lasted position.

It is sometimes desirable when operating on certain portions of certain kinds of shoes temporarily to dispense with the gripper operation. Or, sometimes, it may be desired to use the above identified machine purely as a fastening inserting machine for the operation upon other types of work not calling for a gripper and a tensioning operation. It is therefore the purpose of this invention to provide an effective gripper throw-out mechanism easily operable at the will of the operator at any time during the machine operation without interfering with the latter.

According to one feature of the invention there is provided a gripper throw-out mechanism controlled by the operator and so acting on the gripper operating mechanism that the gripper jaws are locked against closing to prevent the seizing of the upper, whereupon the gripper is moved to an inoperative position in which it is held as long as it is desired to eliminate the gripper operation. In particular, the locking of the gripper jaws against closing occurs when the gripper is in its lowermost position in readiness to seize the upper, whereupon the gripper is raised to an inoperative elevated position with its jaws open, in which position it is held against downward movement.

These and other features of the invention will now be described with reference to the accompanying drawings and will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a view in right hand side elevation of the principal parts of a machine embodying the present invention, with certain parts of the machine broken away;

Fig. 2 is a view in right hand side elevation of mechanism for operating the fastening inserting mechanism;

Fig. 3 is a plan view of the machine illustrated in Fig. 1, with certain parts broken away;

Fig. 4 is a detail view of the throat member and associated mechanism;

Fig. 5 is a sectional view taken along the line V—V of Fig. 4; and

2

Fig. 6 is a detail view in plan of the gripper operating mechanism.

General organization of the machine

The principal operating instrumentalities of the machine and their actuating mechanisms are contained in or secured to a box-like frame **20** (Figs. 1, 2 and 3) which is adapted to rest on a support (not shown). The principal work engaging operating instrumentalities of the illustrated machine are a stationary anvil **22** (Fig. 1), an upper tensioning gripper **24**, and a wiper **26** through which the fastenings are inserted, by mechanism to be described, into the work. The work is a shoe comprising an upper U on a last L, the last carrying on its bottom a ribbed or lipped insole I into lasted relation with which the upper is worked and then secured in this relation by fastenings inserted through the margin of the upper and the lip of the insole. The shoe is manually presented to the machine in a position in which the anvil **22** engages the rear face or inner side of the lip of the insole I on the bottom of the last L over which the upper U is to be tensioned by the gripper **24**. The anvil **22**, of course, is caused initially to engage and support that portion of the insole lip where the fastening inserting operation is to begin, the operation being repeated and progressing along the lip first at one side and then at the other side of the insole while the shoe is held in the operator's hands and is successively moved or fed by him with relation to the machine to present different portions of the shoe successively to the operating instrumentalities of the machine.

The actuating mechanisms of the various movable operating instrumentalities of the machine are driven from a single cam shaft **28** (Figs. 1, 2 and 3) extending transversely of the machine and arranged for rotation in suitable bearings provided in the frame **20**. The cam shaft **28** is driven by connections (not shown) to a suitable source of power, the connections including an operator controlled clutch (not shown) which, when maintained engaged, will continue to rotate the cam shaft and thus cause the machine to run through an indefinite number of cycles, one cycle corresponding to one complete revolution of the cam shaft.

The gripper mechanism

For tensioning the upper U of a shoe presented to the machine in the position illustrated in Fig. 1, heightwise of the last, the illustrated machine is provided with the previously mentioned gripper **24** comprising two jaws **30** and **32** which are rotatable about a common pivot pin **34** and which have upward extensions provided with slots **36**, **38** inclined with relation to each other. A transverse pin **40** extends through both slots **36**, **38** and is carried at opposite ends by parallel

links 42 (Figs. 1 and 6) pivotally secured at their upper ends to parallel arms 44 mounted for free rotary movement on a transverse rod or shaft 46 fast at opposite ends in the frame 20. As will be described, the pin 40 is movable heightwise of the machine so as to open and close the gripper jaws. Upward movement of the pin 40 in the slots 36, 38 closes the gripper 24. The heightwise movement of the pin 40 is produced by rocking the parallel arms 44. To this end each arm 44 has an upwardly and rearwardly extending projection 48, the two projections 48 being interconnected by a web 50. Each projection 48 has secured to it a rearwardly extending rod 52 which passes through a boss provided at the upper end of an arm 54, each arm being freely rotatable about the rod 46. A spring 56 is mounted on each rod 52 and is confined between the boss of the arm 54 at one end and nuts 58 on the rod at the other end. As will be noted, operation of both arms 54 in a clockwise direction, as viewed in Fig. 1, will produce a yielding movement in the same direction of the parallel arms 44, with the result that the pin 40 will be elevated to close the gripper. Thus the gripper is closed by a yieldingly operated mechanism. The two arms 54 are interconnected by a web 60 (Fig. 6). The right hand arm 54 (as viewed from the front of the machine) is part of a two armed lever 62 (Fig. 1) rotatable about the rod 46 and carrying at its lower end a cam roll or cam follower 64 held against the periphery of a cam disk 66 on the shaft 28 by a torsion spring 68 (Figs. 3 and 6) coiled about a spacer 69 between the hub of the lever 62 and the bearing of the rod 46, one end of the spring 68 being in engagement with the lever 62 and the other end with a fixed portion of the frame. Rotation of the cam disk 66 thus causes operation of the transverse pin 40 to open and close the gripper. However, this motion is utilized not only for opening and closing the gripper but for moving the gripper heightwise of the machine either to tension the upper after it has been seized by the gripper or to move the gripper into a position in which it can seize the margin of the upper. As has been pointed out, in the lowermost position of the pin 40 the gripper jaws are open and, assuming that the gripper itself is positioned at the lower end of its heightwise travel, it is to be noted that the movement of the lever 62 by the cam disk 66 in a clockwise direction, as viewed in Fig. 1, will cause an upward movement of the transverse pin 40, with the result that the gripper jaws are closed upon the margin of the upper presented thereto, while the gripper remains in its lowermost position. It is only after the gripper jaws have been firmly closed upon the margin of the upper that the gripper begins its heightwise movement to tension the upper heightwise of the last. To accomplish this the upper extension of the gripper jaw 30 is pivoted by a pin 71 to an arm 70 (Figs. 1 and 6) rotatably mounted on the rod 46. The pin 71 is the main support of the entire gripper 24 which is adapted to move about the pin 71 in a direction transverse to the shoe presented to the machine. The arm 70 is connected by a link 72 (Fig. 1) to a friction device or retarder 74 of a conventional type which functions to prevent an upward movement of the gripper jaws while they are being firmly closed upon the upper. On continued upward movement of the transverse pin 40 after the closing of the gripper the resistance of the friction device 74 is overcome and the gripper is moved heightwise of the machine, moving the arm 70 at the same time in a clockwise direction (Fig. 1) about the rod 46. Reversely, when the gripper is in its elevated position with the jaws closed, downward movement of the transverse pin 40 serves to open the gripper jaws while the gripper is maintained in its uppermost position due to the retarding action of the friction device 74, which action is overcome only after the gripper jaws have been opened by the continued downward movement of the transverse pin. As illustrated in Fig. 1 the cam disk 66 is provided near its high portion with a depression or dip 76 which reaches the cam roll 64 after the high portion has passed it and causes in the elevated and upper tensioning position of the gripper a slight opening of the jaws to permit slippage of the margin of the upper when the latter is being worked into lasted relation to the insole.

The wiper head or throat member

To wipe each portion of the upper U over the insole feather and against the upstanding lip of the insole I after that portion of the upper has been tensioned by the gripper and is held under tension, there is provided a wiper head 80 (Figs. 1 and 4) which also functions as a throat member or nozzle in that the fastenings are inserted into the work through that member. The wiper head 80 is of a substantially rectangular shape having a tapering front end and being arranged for reciprocating movement substantially in a horizontal path into and out of engagement with the shoe presented to the machine. The wiper head 80 comprises a main portion 82 (Figs. 4 and 5) which is provided at its right hand side (as seen from the front of the machine) with a cover plate 84. The wiper head is supported for movement toward and from the work on a front link 86 (Figs. 1 and 2) and a parallel back link 88, the two links having the same effective length. The upper ends of the links are pivotally connected to the wiper head 80. The lower end of the front link 86 is mounted to rotate freely on a rod 90 secured in the machine frame and the lower end of the back link 88 is mounted to rotate freely on a rod 92 secured in the machine frame. To actuate the wiper head there is provided a bell crank lever 100 (Fig. 2) which acts yieldingly on the front link 86 to advance the wiper head 80 toward the work. One arm of the bell crank lever 100 carries a roll or cam follower 102 engaging a cam groove provided in one face of a cam disk 104. The just mentioned yielding operation of the link 86 by the bell crank lever 100 is accomplished in the following manner: There is provided in the front link 86 a socket 106 and a similar socket 108 is provided in the upwardly extending arm of the bell crank lever 100. The two sockets are axially alined and house a spring 110 surrounding a headed bolt 112 extending from the front side of the link 86 through both sockets and through to the rear side of the upwardly extending arm of the bell crank lever 100 where it carries lock nuts bearing against said arm. As will be noted from an inspection of Fig. 2, movement of the bell crank member 100 in a counterclockwise direction will cause a yielding movement of the link 86 in the same direction to advance the wiper head toward the work, but movement of the bell crank member 100 in a clockwise direction will produce a positive movement of the link 86 in the same direction for purposes to be described, this being due to the provision of the bolt 112 and the lock nuts carried by it.

It should be noted that, since the two links 86, 88 carrying the wiper head 80 have the same effective length, a parallel motion results. The rearward movement of the wiper head 80 is adjustably determined by the following mechanism. The back link 88 is provided with a tail piece 114 which has a socket 116 carrying a screw 120 secured in place by a nut 122, the lower end of the screw on rearward movement of the wiper head 80 being adapted to engage an abutment 118 provided on the lower portion of the machine frame.

The wire feeding mechanism

The fastenings to be inserted by the illustrated machine are formed therein from a continuous strand of fastening material, such as wire, which is fed forwardly in the machine step by step and the leading end portion of which is severed to form a single legged straight fastening. The strand of fastening material is preferably wound on a reel (not shown) which is conveniently mounted for rotation on the machine frame and from which the wire passes through suitable guides (not shown) into a wire feeding mechanism.

The leading end portion of the wire, each time the wire has been advanced in the machine, is cut off to form a fastening which then is transferred into the line of drive and inserted endwise into the work.

The fastening driving mechanism

For inserting fastenings into the work presented to the machine there is provided a reciprocating driver 262 (Figs. 4 and 5) which, in the illustrated example, is extremely thin and of the same gage as the wire from which the fastenings are formed. The driver is movable in and with relation to the wiper head 80 and, as fully disclosed in the above-mentioned application for Letters Patent of the United States it is guided and covered all around and over its entire length during the entire course of its travel. The driver 262 is movable in a bar shaped guiding member 264 of rectangular cross section which is seated flush in a longitudinal recess provided in the back face or inside face of the cover 84. The guiding member 264 has extending along the exposed face thereof a groove which serves as the driver passage and which is covered or bridged over, as will be presently described. The driver 262 is connected to a driver bar 266 which is reciprocated in a longitudinal recess provided in the main portion 82 of the wiper head. To hold the guiding member 264 in place there is provided a stop pin 268 (Fig. 5) driven into the cover 84 and abutting the rear end of the guiding member 264. The driver 262 is secured to the driver bar 266 as follows: The rear end of the driver has a lateral fin 270 which extends into a slot provided in one end of a pin 272 carried by the driver bar 266. The rear end of the driver 262 is engaged by a hardened pin 274 also carried by the driver bar 266 and positioned in tangential relation to the pin 272. The pin 274 is provided with a ridge which extends into the groove of the guiding member 264 and engages the rear end of the driver.

It is understood that the machine is provided with mechanism (not shown) adapted to reciprocate the driver so as to cause it to drive a fastening into the work or to return into an inoperative retracted position in which a new fastening may be transferred into the line of drive in front of the driver.

The gripper throw-out mechanism

To adapt the illustrated machine to insert fastenings without utilizing the gripper mechanism either to process certain portions of the workpiece where the gripper operation is unnecessary or undesired, or to insert fastenings into other types of work where no gripper operation at all is required, mechanism is provided to render the gripper mechanism inoperative and maintain it in an inoperative out-of-the-way position. To this end the gripper jaw 32 is provided at its upper portion with a toothed segment 350 (Fig. 1) which is adapted to be engaged by a locking pawl 352 pivoted to a boss 354 provided on the other gripper jaw 30. A torsion spring 355, mounted on the hub of the pawl 352 and having one end engaging the pawl and the other the boss 354, tends to depress the pawl 352 into locking engagement with the segment 350. The pawl has an upwardly extending arm 356 the upper end of which is pivotally connected to a link 358 arranged for lengthwise reciprocation and carrying at its rear end a pin 360 (Figs. 1 and 6) the opposite ends of which engage slideways provided in a forked tail piece 362 of the arm 70. Sliding movement of the link 358 toward the left of Fig. 1 permits the spring 355 to move the pawl 352 into locking engagement with the segment 350 and sliding movement of the link 358 toward the right of Fig. 1 lifts the pawl 352 out of engagement with the segment 350. The link 358 is connected at its rear end by the pin 360 to a latch 364 of substantial length. The rear end of the latch 364 is of considerable width, and, in order to maintain the pawl 352 in its elevated inoperative position and thus to maintain the gripper operative, the hooked rear end of the latch 364 is normally engaged by a pawl 366 freely rotatable on a transverse shaft 368 rotatably mounted in the machine frame. The pawl 366 is biased by a torsion spring 370 which tends to move the pawl in a clockwise direction, as viewed in Fig. 1, into locking engagement with the latch 364. This movement is limited by a fixed stop pin 372 engaging a slot provided in a depending portion of the pawl 366. To render the gripper mechanism inoperative the latch 364 is elevated out of engagement with the pawl 366 and this is effected by a plate (not shown) secured to the shaft 368 and underlying a portion of the rear end of the latch 364. Secured to the shaft 368 and spaced from the just mentioned plate is a similar plate 376 which overlies the end of a treadle rod 378 upward movement of which, when permitted, causes the plate to be raised with the result that the latch 364 is freed. As soon as the latch 364 is disengaged from the pawl 366 the spring 355 becomes active to slide the link 358 toward the left of Fig. 1 and to depress the pawl 352 into locking engagement with the segment 350 so as to prevent the gripper from closing. Mechanism is provided to prevent the upward movement of the treadle rod 378, even though the rod may be stressed in that direction, until a predetermined point in the cycle of gripper operation has been reached, namely when the gripper is substantially in its down position and its jaws are open. In this position of the gripper the cam roll 64 is near the low portion of the cam disk 66. The purpose of this arrangement is to insure that the gripper is open when it is being rendered inoperative, the gripper jaws being locked in their open position, whereupon the gripper is elevated into its inoperative position and held in that

position, as will be described. To accomplish this the treadle rod 378 has secured to it a collar 380 the right side of which is provided with a shoulder, as illustrated in Fig. 1. With the collar 380 cooperate two pawls, namely, a left hand pawl 382, adapted to engage beneath the collar 380 and hold it and thus the treadle rod 378 in an elevated position and a right hand pawl 384 which normally engages the shoulder portion of the collar 380 so as to prevent upward movement of the collar and the treadle rod 378. The two pawls 382, 384 are biased by springs (not shown) toward the collar 380 and are pivotally secured to a bracket 386 mounted in the machine frame. To operate the pawls there is provided a pin 388 extending laterally from a link 390 the front end of which is pivotally secured to the gripper operating cam lever 62 and the rear end of which is slotted, the slot being engaged by a pin 392 extending laterally from the bracket 386, this to permit lengthwise reciprocation of the link 390 upon rocking movement of the cam lever 62. As will be described, the pin 388, when being reciprocated by the link 390, is adapted to release either pawl 382 or 384 from engagement with the collar 380. For the purpose of maintaining the gripper mechanism locked out there is secured on the treadle rod 378 a collar 394 which is adapted on upward movement of the treadle rod to engage a latch 396 pivotally secured at its right hand end (Fig. 1) to the bracket 386 and normally maintained in a low position against a stop pin 397 by a spring 398. The latch 396 when raised by the collar 394 is adapted to engage behind a shoulder 400 provided on the link 390 when that link is in its forward position in which the gripper is elevated, this preventing the link from returning. Thus the gripper is locked in its elevated inoperative position.

In the position of the machine parts illustrated in Fig. 1, the gripper mechanism is operative and the gripper throw-out mechanism is inoperative with the treadle rod 378 down and and its upward movement prevented by the engagement of the pawl 384 with the collar 380. Let it be assumed now that upward pressure is applied to the treadle rod 378. Nothing happens until the low portion of the cam 66 is opposite the cam follower 64 and the link 390 has been moved rearwardly by the cam lever 62, causing the pin 388 to engage the pawl 384 and knock it off the collar 380. Now the treadle rod 378 is free to move up. As will be noted, the upward movement of the treadle rod is thus possible only when the low portion of the cam 66 is opposite the roll 64 or, in other words, when the gripper is down and open. The upward movement of the treadle rod 378 accomplishes two things. First, the plate 376 is elevated, freeing the latch 364 to enable the torsion spring 355 to depress the pawl 352 into locking engagement with the toothed segment 350. Accordingly, the gripper cannot be closed. The other function exercised by the treadle rod is, as already described, the elevation of the latch 396 into a position in which, upon forward movement of the link 390, as the cam roll 64 approaches the high portion of the cam 66, it can snap behind the shoulder 400 and thus hold the cam lever 62 locked out in a position similar to that shown in Fig. 1. It should be noted that this outward movement of the link 390 by the corresponding movement of the cam lever 62 in a clockwise direction, as viewed in Fig. 1, causes elevation of the gripper into its inoperative position with the gripper jaws open, the gripper being then maintained in that position by reason of the locking of the link 390 against rearward movement by the latch 396. However, the link 390 is not locked in its frontmost position, thus enabling the pawl 382 to engage beneath the collar 380 to hold the treadle rod 378 up. Thus, a slight forward movement of the link 390 occurs even while the gripper mechanism is locked out when the cam roll 64 passes over the highest portion of the cam 66 with the result that the pawl 382 is moved out of engagement with the collar 380 once during each cycle, namely when the highest point of the cam 66 is opposite the cam roll 64. Accordingly, the treadle rod 378 can be lowered again only at that time. When it is desired to throw the gripper mechanism into operation, the treadle (not shown) operating the treadle rod 378 is released but, as pointed out, the treadle rod cannot move down since it is locked by the pawl 382. The pawl 382 becomes automatically unlocked when the cam roll 64 passes over the highest portion of the cam 66, causing the above mentioned slight forward movement of the link 390 and the pawl releasing pin 388. As the treadle rod 378 goes down the collar 394 also is lowered, permitting the spring 398 to pull the latch 396 out of engagement with the shoulder 400, thus enabling the link 390 again to move rearwardly in the machine and accordingly permitting the gripper to descend and to be operated in the normal way. Of course, the lowering of the treadle rod 378 also causes the plate 376 to be lowered, with the result that the latch 364 is lowered. To unlock the gripper jaw 32 by raising the locking pawl 352 there is secured on a rearward extension of the wiper head 80 a catch 402 (Figs. 1 and 2) which, during the rearward movement of the wiper head, engages the hooked end of the latch 364 and pulls the latch rearwardly into locking engagement with the pawl 366, thereby sliding the link 358 rearwardly in the machine and elevating the pawl 352 against the pressure of its spring 355.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a shoe lasting machine, a lasting gripper adapted to tension a shoe upper on a last heightwise of the last, a throat member movable into engagement with the tensioned upper, a driver movable in the throat member to insert fastenings into the work so as to secure the tensioned upper in lasted relation thereto, means for both moving the gripper heightwise of the machine and for opening and closing the gripper, and operator controlled means adapted to lock the gripper against closing and to arrest the gripper in an elevated position without affecting the operation of the machine.

2. In a shoe lasting machine, a lasting gripper adapted to tension a shoe upper on a last heightwise of the last, a throat member movable into engagement with the tensioned upper, a driver movable in the throat member to insert fastenings into the work so as to secure the tensioned upper in lasted relation thereto, means for both moving the gripper heightwise of the machine and for opening and closing the gripper, and operator controlled means adapted to lock the gripper against closing and to arrest the gripper in an elevated position, and means permitting the operation of said operator controlled means only when the gripper is substantially in its lowermost position.

3. In a shoe lasting machine, a lasting gripper

adapted to tension a shoe upper on a last heightwise of the last, a throat member movable into engagement with the tensioned upper, a driver movable in the throat member to insert fastenings into the work so as to secure the tensioned upper in lasted relation thereto, means for both moving the gripper heightwise of the machine and for opening and closing the gripper, means for arresting the gripper in an inoperative elevated and open position, operator controlled means for initiating the operation of said arresting means, and means for preventing the operation of said operator controlled means unless the gripper is substantially in its lowermost position.

4. In a shoe lasting machine, a lasting gripper adapted to tension a shoe upper on a last heightwise of the last, a throat member movable into engagement with the tensioned upper, a driver movable in the throat member to insert fastenings into the work so as to secure the tensioned upper in lasted relation thereto, gripper operating means for both moving the gripper heightwise of the machine and for opening and closing the gripper, a cam lever adapted to actuate the gripper operating means, a cam provided with a high and a low portion and adapted to oscillate the cam lever, means for arresting the gripper in an inoperative and open position, and means for releasing the gripper, the releasing means being operative only when the high portion of the cam is acting on the cam lever.

5. In a shoe lasting machine, a lasting gripper adapted to tension a shoe upper on a last heightwise of the last, a throat member movable into engagement with the tensioned upper, a driver movable in the throat member to insert fastenings into the work so as to secure the tensioned upper in lasted relation thereto, gripper operating means for both moving the gripper heightwise of the machine and for opening and closing the

gripper, a cam lever adapted to actuate the gripper operating means, a cam provided with a high and a low portion and adapted to oscillate the cam lever, means for arresting the gripper in an inoperative position, means for preventing the operation of the arresting means unless the low portion of the cam is acting on the cam lever, means for releasing the gripper out of inoperative position, and means for preventing the operation of the releasing means unless the high portion of the cam is acting on the cam lever.

6. In a shoe lasting machine, a lasting gripper adapted to tension a shoe upper on a last heightwise of the last, a throat member movable into and out of engagement with the work, a driver movable in the throat member to insert fastenings into the work so as to secure the tensioned upper in lasted relation thereto, locking means adapted to prevent the closing of the gripper, cam operated means adapted to move the open gripper into an inoperative position and to hold the gripper in that position, operator controlled means for initiating the operation of both the aforementioned locking means and the cam operated means, means automatically active at a predetermined point in each cycle of operation to release the gripper from its inoperative position, and means associated with the throat member and adapted on movement of the throat member out of engagement with the work to render the locking means inoperative.

ROBERT H. LAWSON.

REFERENCES CITED

The following references are of record in the file of this patent:

Number	Name	Date
456,225	Sinning	July 21, 1891