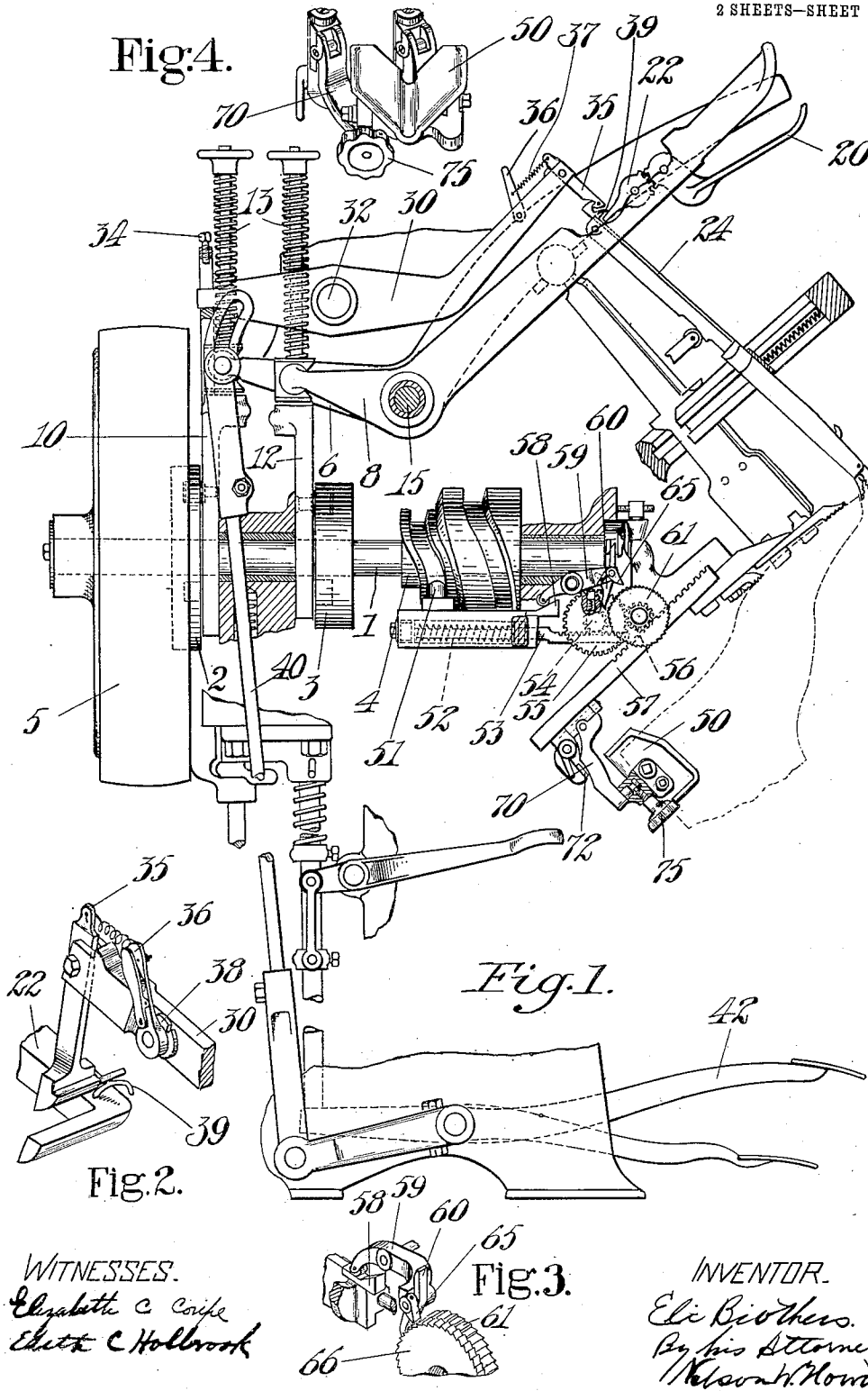


E. BROTHERS.
PULLING OVER MACHINE.
APPLICATION FILED MAY 18, 1910.

1,017,736.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 1.



UNITED STATES PATENT OFFICE.

ELI BROTHERS, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PULLING-OVER MACHINE.

1,017,736.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed May 18, 1910. Serial No. 562,072.

To all whom it may concern:

Be it known that I, ELI BROTHERS, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain Improvements in Pulling-Over 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 pulling-over machines and has for its object to effect certain improvements in machines of the type shown in United States Letters Patent No. 663,777.

One feature of this invention consists in means for automatically releasing the toe gripper of the machine after it has properly pulled the upper lengthwise and preferably after the side grippers have pulled the upper transversely to a sufficient extent to hold it from undesirably drawing back after the release of the toe gripper. A special object of this mechanism is to facilitate the application of molded box toes or toe stiffeners to shoes. If a molded stiffener is put into place between the shoe lining and the shoe tip before the upper pulling operation it is liable to be displaced during the stretching of the upper so that it will not be in position to fit the toe portion of the last as it should do after the upper has been overdrawn and secured in pulled over position. In view of these conditions it has heretofore been proposed to release the toe gripper manually after the upper has been pulled, then turn back the toe tip, and insert and adjust the molded stiffener, after which the toe tip is returned to normal position and reengaged by the gripper for carrying the stock over the last bottom into position to be tacked by the further automatic operation of the machine. By the use of the present invention the labor of manually releasing the toe gripper is eliminated. There is also an advantage secured by this automatic release of the toe gripper when pulling over shoes on some shapes of lasts which have high toes and low balls between the toe and the instep incline into which difficulty is frequently experienced in pulling the upper down to the wood of the last. A similar advantage might be obtained by relaxing the pull effected by the toe gripper to permit the upper to be more readily pulled down by the side grippers

into this low portion of a last, and such an arrangement is within the broad aspect of this invention. Preferably provision is made for rendering this automatic releasing mechanism for the toe gripper operative or inoperative as conditions may require.

Preferably also the machine is provided with means, such for example as that shown in my prior application Serial No. 454,440, for relaxing the tension effected by the side grippers to facilitate the insertion of the molded toe stiffener. By so doing the stiffener can more easily be forced backwardly between the upper and the lining into proper relation to the toe tip seam. In the combination of the described actuating mechanisms for the toe and side grippers resides another feature of this invention.

Another feature of this invention consists in provision for locking the heel rest. As herein shown the heel rest is automatically locked against forward movement while in shoe holding position. When the toe gripper is released as described, particularly if the tension effected by the side grippers is relaxed as suggested, the heel rest which is under spring pressure is liable to push the shoe forwardly and a particular object of this feature of the invention is to obviate such displacement of the last.

Another feature which is sometimes useful in making shoes on crooked lasts provides means for locking the heel rest in a selected lateral position before the shoe is presented thereto. The heel rest of this machine is suspended for normally free lateral movement to permit it to adapt itself to the lateral position of the heel end of the last after the position of the latter has become substantially determined by the uplift of the shoe against the usual bottom rest. In some extreme cases it has been found that the advancing heel rest has some tendency to displace the shoe laterally as it comes into bearing with the shoe and adjusts itself thereto. To overcome this the machine of the present invention is provided with means for securing the normally free heel rest in positions of lateral adjustment preliminary to the operation of the machine.

These and other features of this invention will now be described in connection with the drawings and then pointed out more definitely in the claims.

Figure 1 is a side elevation showing so

much of said machine as is needed for explaining this invention; Figs. 2 and 3 are perspective details; Fig. 4 is a view of the heel rest; Fig. 5 is a detail of the toe gripper releasing devices.

The main shaft 1 of the machine carries cams 2, 3 and 4 among others and receives movement from the pulley 5 through speed reducing gears and an automatic clutch which divides the cycle into two steps with a dwell between the power driven upper stretching operation and the overlaying and tacking of the upper. The cams 2 and 3 are connected respectively to the side and toe gripper levers 6 and 8 through slides 10 and 12 and springs 13. The levers are fulcrumed on a rod 15 and from near their front ends the grippers are suspended. The front end portions of the levers are formed as handles and to the toe gripper lever is pivoted a hand piece 20 having toothed engagement with a rocker 22 the rear end of which engages a slide 24 that extends down the operating bar of the front gripper to the gripper carrier for effecting manual opening and closing of the grippers while the shoe is in the machine, all as shown and described in said prior patent.

A new lever 30 is fulcrumed at 32 with its rear end under an adjustable bolt 34 in a yoke that extends upwardly from the slide 10. The front end of the lever 30 carries a latch 35 adapted to have a hooking engagement with an extension of the slide 24. By this arrangement the toe gripper is first operated automatically from the cam 3 and slide 12 to seize and pull the upper and the slide 24 is operated automatically from the cam 2 and slide 10 to open the toe gripper in the last portion of the effective movement of said cam and slide and at a time determined by the adjustment of the bolt 34. In practice the cams 2 and 3 are formed relatively so that the toe gripper is automatically closed and uplifted to stretch the upper lengthwise in advance of the operation of the side grippers to stretch the upper transversely so that the automatic opening of the toe gripper occurs after its full forward stretching movement has been completed and during the last portion of the transverse stretching by the side grippers, all of which occurs before the overdrawing movement which is effected in well known manner described in said prior patent by springs X³¹⁰.

The latch 35 is pivoted to the lever 30 and is connected to a pivoted arm 36 having a pawl to engage a notch in a disk 38, Fig. 2, for securing the latch out of operative relation to the slide 24 when automatic opening of the toe gripper thereby is not desired.

The levers 8 and 30 move about different centers as has been suggested so that the hook of the latch 35 and the co-acting hook

on the gripper slide 24 are moved, during the operation of the machine in the arcs indicated by broken lines in Fig. 5. These lines intersect at a point which is approximately the location occupied by the slide hook when the gripper is depressed to its shoe receiving position. At this time the latch carrying arm of the lever 30 is also in its lowest position to which it is moved when the slide 10 rises see Fig. 1. The latch is then in position to interlock automatically with the slide 24 in readiness for the described gripper opening operation when the slide 10 with its bolt 34 descends. The opening of the toe gripper takes place when the levers 8 and 30 are raised as in Fig. 5 and in moving to that position the latch 35 is turned about its pivot from the dotted line relation to its lever 30 to the full line relation thereto because of the different locations of the two lever fulcrums 32 and 15. This turning movement of the latch 35 takes place against the tension of a spring 37. In the upward movement of lever 30 and latch 35 the hook of the latch is carried forwardly in its arc out of engagement with slide 24 so that the slide is automatically released and allowed to descend and close the toe gripper again while the latch is turned by the spring 37 to the dotted line position Fig. 5 where it rests against a stop shoulder on its lever. But in the meantime the upper has been freed from the gripper jaws. The machine is then in condition for permitting the use of the hand piece 20 to reopen the jaws at the will of the workman to engage the toe gripper again with the upper. If for any reason the latch 35 should not automatically disengage itself from the slide 24 provision is made in a stud 39 on the rocker 22 for effecting such disengagement by the use of the hand piece 20.

The side gripper levers are engaged at their rear ends by rods one of which is indicated at 40 and connected to a treadle by which the rear ends of said levers may be uplifted against the tension of their springs 13 to lower the side grippers while they hold the upper under tension. This invention is explained in my prior application Serial No. 454,440, in which it is claimed. It is herein combined with the previously described invention and is employed for relaxing the tension with which the upper is held by the side grippers whereby the insertion of the molded box toe or toe stiffener between the toe tip and the upper lining is facilitated. This is particularly desirable when, as is usual, the side gripper engages the upper at the tip seam and the toe stiffener is of a length to extend substantially to that seam.

The heel rest 50, which is employed to support the heel end of the shoe during the upper pulling operation, is yieldingly ad-

vanced to shoe resting position when the machine is first started. This is effected from the cam 4 through the roll 51, spring 52, rack bar 53, pinions 54, 55, 56 and rack bar 57 from which the heel rest is hung. Provision is also made for giving a final positive advance to the heel rest from the incline 58, lever 59, pawl 60 and ratchet 61 on the shaft of pinion 56 which acts through the pinion 56 upon the rack bar 57 as appears in Fig. 1 and as described in British Patent No. 12,304 of 1903. When the toe gripper is released from the upper and the tension effected by the side grippers is relaxed for inserting the toe stiffener as above described there is a tendency for the spring 52 to push the heel rest and the shoe farther forwardly. To prevent this the lever 59 is provided with a second pawl or leg 65 which engages a disk 66 that is fast on the ratchet disk shaft and has rearwardly faced teeth by which the heel rest is locked against such advance after it has been adjusted to the shoe.

The heel rest is suspended from the rack bar 57 and a like bar symmetrically arranged at the opposite side of the machine and hidden from view in Fig. 1, this hanging of the rest being effected by links 70 which are mounted to permit a slight backward tilting of the rest into contact with a laterally stationary bar 72. This allows the heel rest a normal free laterally swinging movement by which, as it advances into engagement with the heel end of the shoe, it adapts itself automatically to the lateral position of the heel end of the shoe. A screw lock 75 is herein provided to cooperate with the rest and with one of its pivots to secure the heel rest in laterally adjusted position independently of the shoe and preliminary to the engagement of the shoe therewith.

In the use of the machine equipped with this invention for pulling over shoes which are to be made with molded box toes or toe stiffeners the shoe is assembled without the toe stiffener and presented to the machine with the toe tip in the toe gripper and the sides in the side grippers, the tip seam being positioned in suitable relation to the side grippers to provide the desired length and angularity of tip. In the first step in the cycle of automatically effected operations the cams 2, 3 and 4 close and uplift the toe and side grippers successively whereby the upper is pulled lengthwise before the side grippers seize it and stretch it transversely. During the pull of the side grippers and at a time determined by the adjustment of the bolt 34 the new lever 30 is rocked to open the toe gripper so that the transverse stretching is finished with the toe end of the upper free and the machine comes to rest with the toe gripper released from the shoe and raised by its spring 13 to a position out of

the operator's way. During this movement of the cam shaft the cam 4 has advanced the heel rest into shoe supporting position and the leg 65 has locked it against further forward movement while the pawl 60 locks said rest against backward displacement. While the machine is at rest with the upper held under tension by the side grippers any necessary adjustments of the upper and the last are made and then the toe tip is turned or folded backwardly and the molded toe stiffener is applied by pushing its rear edge backwardly between the tip and the lining, usually to the tip seam. To facilitate this work the tension with which the upper is held is relaxed by depressing the treadle 42 and the side grippers, the pawls 60, 65 maintaining the heel rest stationary. With the stiffener in place the tip is returned to normal position thereover and the tip, and also the lining if desired, is reengaged by the toe gripper for the purpose of holding and carrying these parts into position to be tacked when the machine is restarted. To reengage the toe gripper the lever 8 is depressed by its handle against the pressure of its spring 13 while at the same time the hand piece 20 is lifted to raise the slide 24 for opening the gripper as it is lowered into gripping position. The hand piece 20 is then released to allow the gripper to close upon the upper after which the lever is released and the toe gripper is lifted by the force of its spring 13. If shoes are to be operated upon which do not require the insertion of a toe stiffener after the upper is pulled then the latch 35 will be moved out of position to engage the slide 24 by turning the lever 36 and will be secured by the plate 38 whereby the movement of lever 30 will be rendered ineffective. The heel rest may at any time be secured by the lock 70 in a laterally adjusted position.

Having explained the nature of this invention and described one embodiment thereof I claim as new and desire to secure by Letters Patent of the United States:—

1. A pulling-over machine having, in combination, toe and side grippers, means for actuating said grippers to pull the upper and means for automatically releasing the toe gripper while the side grippers continue to hold the upper said machine having provision for manually reengaging the toe gripper with the upper, and means for effecting overdrawing and securing of the upper at the toe and sides of the shoe.

2. A pulling-over machine having, in combination, toe and side grippers, means for actuating the toe gripper to pull the upper lengthwise, means for subsequently actuating the side grippers to pull the upper and means for automatically releasing the toe gripper from the upper while the side grippers hold it.

3. A pulling-over machine having, in combination, toe and side grippers, means for actuating the toe gripper to pull the upper lengthwise, means for subsequently actuating the side grippers to pull the upper and means for automatically relieving the longitudinal tension on the upper while the transverse tension is maintained.
4. A pulling-over machine having, in combination, toe and side grippers, means for actuating the toe gripper to pull the upper lengthwise, means for subsequently actuating the side grippers to pull the upper and means for automatically relieving the longitudinal tension effected by the toe gripper while the side grippers are moving to pull the upper transversely.
5. A pulling-over machine, having, in combination, the toe gripper, the lever 8 from which it is suspended, the cam 3 and slide 12 from which the lever is rocked, the unlocking lever 20, and the adjustable member 34 for actuating the unlocking lever at a selected time in the operation of the machine.
6. A pulling-over machine having, in combination, toe and side grippers, mechanism to actuate them to pull an upper and means for automatically opening the toe gripper which is arranged for adjustment to open the gripper at a selected time, substantially as described.
7. A pulling-over machine having, in combination, toe and side grippers, mechanism to actuate them to pull an upper and means adapted to be rendered operative or inoperative for automatically opening the toe gripper while the side grippers continue to hold the upper.
8. A pulling-over machine having, in combination, means for pulling over a shoe, a rest for the heel of the shoe, means for yieldingly actuating said rest forwardly, and means operating automatically for locking said rest against further forward movement after it has reached a shoe supporting position determined by the length of the particular shoe being operated upon.
9. A pulling-over machine having, in combination, means for pulling over a shoe, a rest for the heel of the shoe, means for yieldingly actuating said rest forwardly, and means operating automatically for locking said rest against additional movement either forwardly or backwardly after it has been advanced into shoe supporting position.
10. A pulling-over machine having, in combination, means for pulling over a shoe, a rest for the heel of the shoe, means for yieldingly actuating said rest forwardly, and oppositely arranged pawls and ratchets to lock the heel rest against movement forwardly or backwardly from its shoe supporting position.
11. In a pulling-over machine means for pulling an upper over a last, in combination with a heel rest freely movable laterally for crooked lasts, and means whereby said rests may be secured in laterally adjusted position preliminary to the presentation of the shoe to the machine.
12. In a pulling-over machine means for pulling an upper over a last, in combination with a laterally movable heel rest, a holder on which the rest is normally free to move laterally to support crooked lasts, and means arranged for manual operation after such movement for locking the rest in lateral position preliminary to its engagement with the shoe.
13. A pulling-over machine having, in combination, toe and side grippers arranged symmetrically with relation to the median line of the machine, automatic actuating means for said grippers and a heel rest for the shoe arranged for lateral adjustment independently of the shoe into unsymmetrical relation to the median line of the machine for supporting right and left crooked lasts.
14. A pulling-over machine having, in combination, toe and side grippers arranged symmetrically with relation to the median line of the machine, automatic actuating means for said grippers and a heel rest for the shoe, and means for securing said rest in unsymmetrical lateral relation to the median line of the machine preliminary to the operation of the grippers.
15. A pulling-over machine having, in combination, toe and side grippers and actuating mechanism therefor, and means for automatically releasing the toe gripper from the upper in advance of the release of the other gripper.
16. A pulling-over machine having, in combination, toe and side grippers and actuating mechanism therefor, and means arranged for adjustment to control the time at which the toe gripper shall be released from the upper without similarly changing the time when the side grippers shall be released.
17. A pulling-over machine having, in combination, toe and side grippers, means for actuating said grippers to pull the upper, means for automatically releasing the toe gripper and a single means connected with both side grippers for moving them to relax the tension on the upper without releasing the upper.
18. A pulling-over machine having, in combination, toe and side grippers, means for actuating said grippers to pull the upper, means for automatically relaxing the tension with which the toe gripper pulls the upper and a single means connected with both side grippers for moving them to relax the tension with which they hold the upper.
19. A pulling-over machine having, in

combination, toe and side grippers and actuating mechanism therefor arranged to cause said grippers to seize and pull an upper lengthwise and transversely and then cause the toe gripper to release the upper automatically, and additional means for moving the side grippers to relax the tension on the upper to facilitate the insertion of a toe stiffener.

20. A pulling-over machine having, in combination, toe and side grippers, mechanism to actuate them to pull an upper, means for automatically opening the toe gripper and a single foot actuated means to lower the side grippers substantially as and for the purpose herein described.

21. A pulling-over machine having, in combination, a gripper, means for actuating the gripper to seize and pull an upper, an opening device 24, an opening lever 30, and a latch 35 carried by the lever, said parts being arranged for automatic engagement and disengagement of the latch and the opening device.

22. A pulling-over machine having, in combination, a gripper, a lever for raising the gripper, a second lever and a device thereon for opening the grippers, and means for moving said levers about different centers to effect automatic connection and disconnection of the opening device and the gripper.

23. A pulling-over machine having, in combination, the gripper and its opening slide 24, the latch 35 and actuating means for causing the latch to move the slide to open the grippers and then automatically disengage itself from the slide to free the grippers again.

24. A pulling-over machine having, in combination, the gripper and its opening slide 24, the latch 35 and actuating means for causing the latch to move the slide to open the grippers and means arranged to permit manual operation to free the latch from the slide for allowing further use of the grippers.

25. A pulling-over machine having, in combination, the gripper and its opening slide 24, the latch 35 and actuating means for causing the latch to move the slide to open the gripper and additional means for effecting manual closing and opening of the gripper.

26. A pulling-over machine having, in combination, a gripper, automatic means for actuating it including provision for bringing the machine to rest with the gripper holding the stock, means for opening the gripper, and additional means arranged to be rendered operative or inoperative for opening the gripper automatically.

27. A pulling-over machine having, in combination, a gripper, automatic means for actuating it including provision for opening the grippers at a predetermined point in the machine's operation, and means adapted to be rendered operative or inoperative to open the grippers automatically at an earlier point in the machine's operation.

28. A machine of the class described having, in combination, a gripper, actuating mechanism for causing the gripper to seize, pull, overdraw and then release an upper, and means adapted to be rendered operative or inoperative to cause the gripper automatically to release the upper before the overdrawing movement of the gripper.

29. A machine of the class described having, in combination, a gripper, actuating mechanism therefor including devices by which automatic opening of the gripper at one point or at a substantially different point in the cycle of the machine's operation may be predetermined by the operator.

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

ELI BROTHERS.

Witnesses:

ELMER B. GRUSH,
ARTHUR L. RUSSELL.