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J. A. BATA

2,116,819

SHOE AND BOOT MAKING MACHINE

Filed June 16, 1936

2 Sheets-Sheet 1

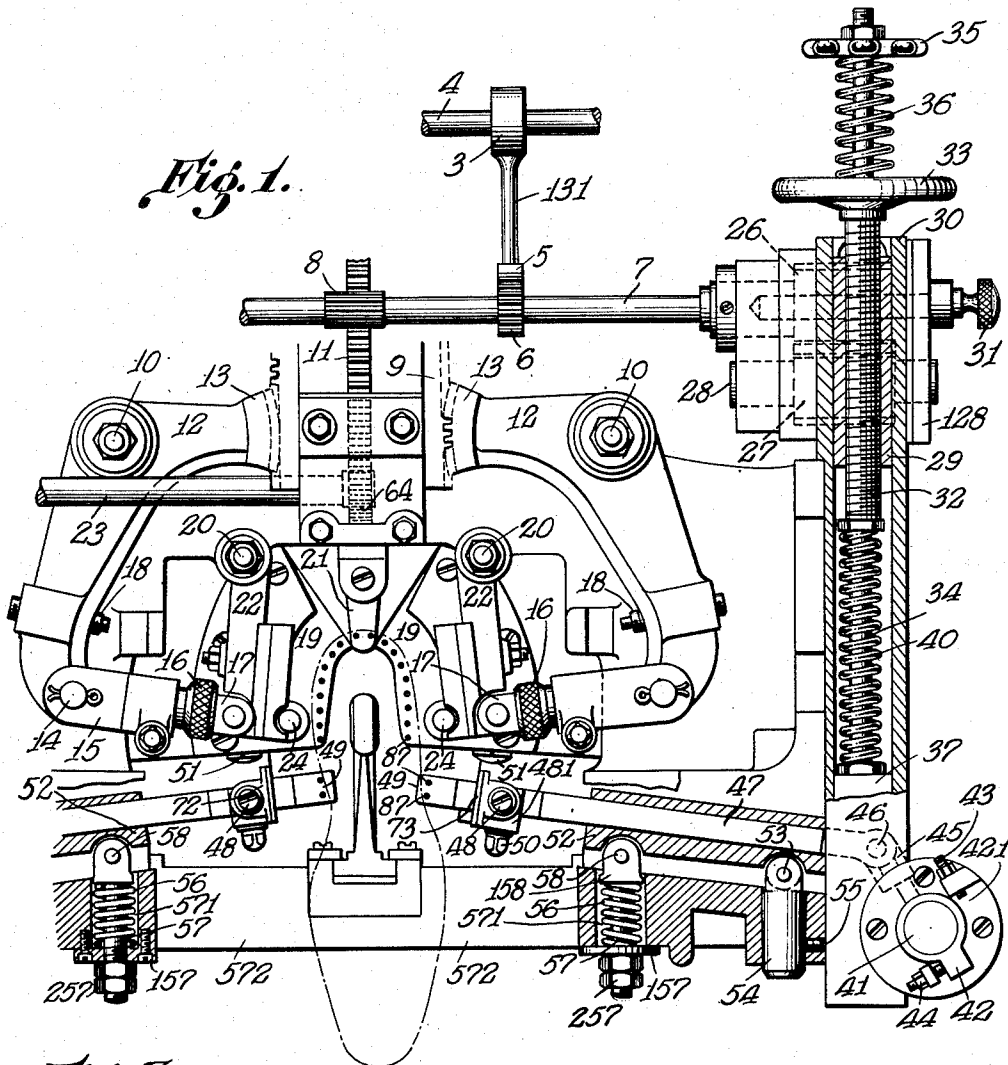


Fig. 3.

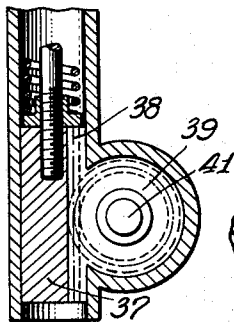


Fig. 6.

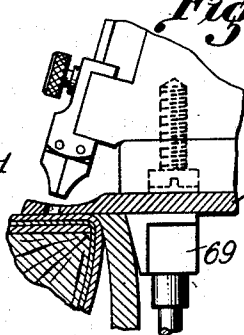
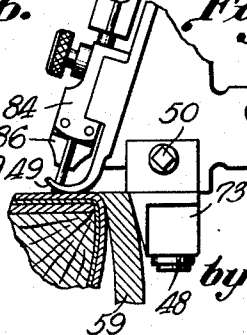


Fig. 7.



Inventor:
J. A. Bata
Glascock
by Downing & Leblond
Attorneys

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2 Sheets-Sheet 2

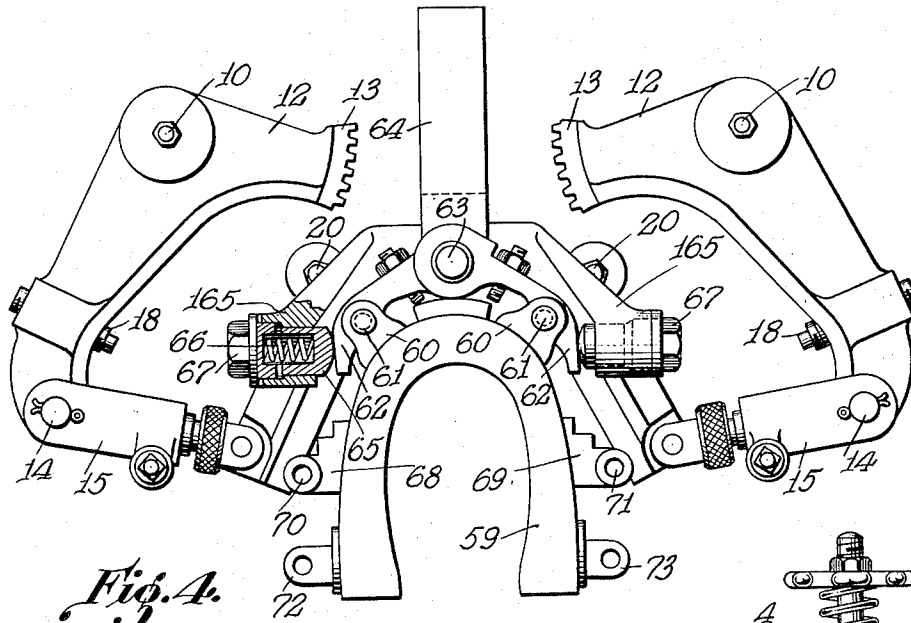


Fig. 4.

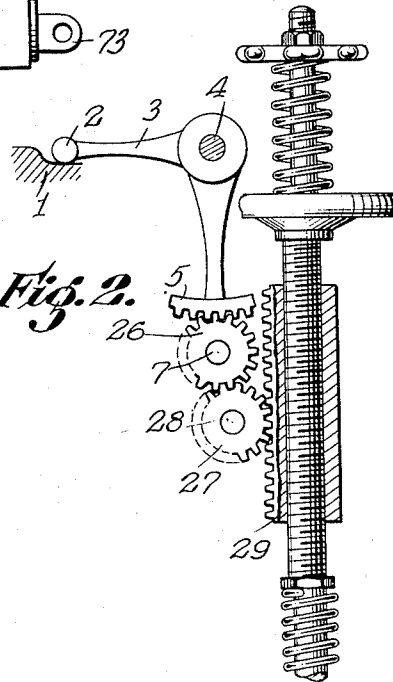
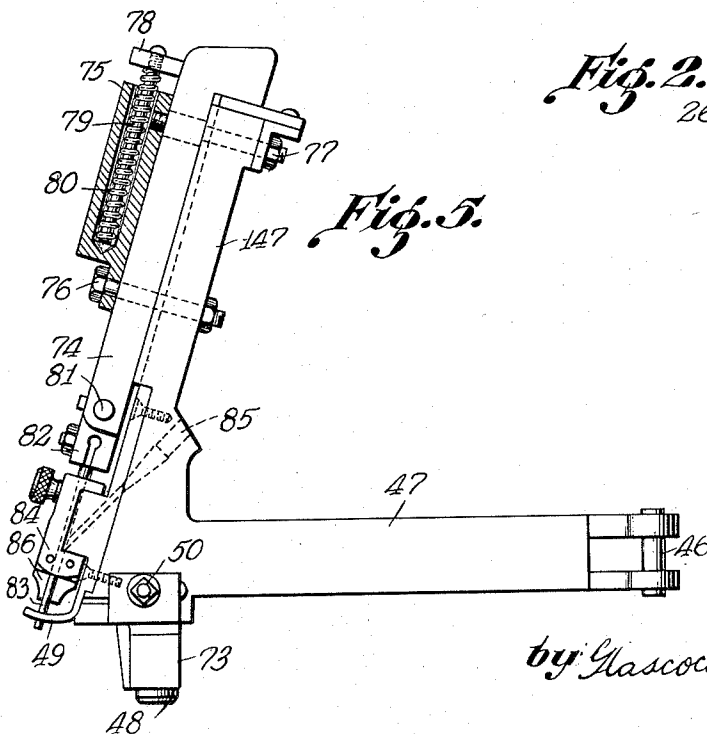


Fig. 2.



UNITED STATES PATENT OFFICE

2,116,819

SHOE AND BOOT MAKING MACHINE

Jan A. Bata, Zlin, Czechoslovakia

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6 Claims. (Cl. 12-4)

This invention relates to lasting machines for footwear and more particularly to heel seat lasting machines which stretch the upper on the last and at the same time attach the shoe heel to the insole by fixing means, for instance tacks, of the kind disclosed for example in Patent No. 1,852,015 issued to J. C. Jorgensen.

In the manufacture of shoes of various kinds, for instance welted shoes, it is the usual practice to pull over the upper on the last in one machine while the heel is seated and tacked on by another machine. According to a further method the heel part of the upper is moulded to the last and at the same time attached by tacks to the insole, in the same machine. In footwear made by this method, however, the leather of the upper frequently exhibits fullness, wrinkles or folds in front of the heel part. This is due to the forward motion of the heel wipers in the direction of the toe which stretch the leather, particularly soft leather and leave the above-mentioned defects which have to be removed by hand.

The present invention has for its objects to improve this method and provide a machine which is free from the defects referred to. The machine, according to the present invention is provided with a resilient heel grip member shaped to conform approximately to the shape of the heel of the last on which the heel seats are to be lasted and by means of which the heel part of the upper is held close against the last, the said heel grip member being operatively connected to lateral wipers which push and stretch the upper over the last and which co-operate with heel wipers of the known type which bend over the edges of the upper in such a manner that the actual tacking on of the shoe heel can be effected.

A constructional example of the machine according to the invention is illustrated in the accompanying drawings, in which

Fig. 1 is a view from below of the main wipers and lasting tools of the machine constructed according to the invention, including a section through the driving and relief arrangement of the lateral wipers,

Fig. 2 is a cross-section of the driving means for the lateral wipers with diagrammatically indicated drive from the main cam disc,

Fig. 3 is a section through a detail of the transmission gear of a lateral wiper,

Fig. 4 is a view of the heel clamping part with the elastic heel grip member,

Fig. 5 is a side view of the lateral wiper combined with the tacking tool,

Fig. 6 is a side view, partly in section, of the

heel push-over member and the known tacking tool and

Fig. 7 is a view, partly in section, of the lateral wipers combined with the tacking tool.

The individual working motions of all the parts of the machine hereinafter described are derived from the main cam disc 1 (Fig. 2), only a fragment of which is shown, the said cam disc being operatively engaged by an antifriction roller 2 rotatably mounted on one arm 3 of a bell crank pivoted on a pin 4 fixed on the machine frame. The other arm 131 of the bell crank is provided at its free end with a toothed segment 5 which meshes with a pinion 6 fixed on a shaft 7. On the shaft 7 is also fixed a toothed pinion 8 (Fig. 1) which meshes with the teeth of a rack 11, which is rigidly connected to a pair of toothed racks 9. The teeth of the racks 9 mesh with toothed segments 13 on the levers 12 which are arranged, one on each side of the last. The levers 12 are pivoted on pins 10 fixed on the machine frame and are connected up by means of links 15 pivotally connected to the levers by means of pins 14, the links 15 being provided with forked ends 17 which are screwed into the links, knurled grips 16 on the forked ends 17 enabling the latter to be screwed into and out of the links for adjusting the length of the link. The inward motion of the links 15 is limited by abutment screws 18.

The forked ends 17 are pivotally connected to lateral pressure applying levers 22 which are pivoted on pins 20 fixed to the machine frame. The levers 22 are provided with apertures 24 for the pivotal attachment of jaws 68, 69 on the resilient heel grip member 59 (Fig. 4). The jaws 68, 69 are provided with apertures 70, 71 and are attached to the levers 22 by means of pins inserted through the said apertures and through the apertures 24 in the levers 22. By means of the jaws 68, 69 the resilient heel grip member 59 is forced against the heel portion of the shoe so as to exert lateral pressure thereon when the levers 22 are moved inwardly.

On the cam 1 being rotated it rocks the bell crank 3, 131 and through the intermediary of the rock shaft 7, the racks 11 and 9 the levers 12 are rocked inwardly forcing the resilient heel grip member 59 around the heel part of the shoe and holding the said heel part ready for wiping by the heel wipers 19 and 21.

The wiper plates 19 are mounted, one on each side of a central heel wiper 21, in arcuate guiding means in the well-known manner so as to be capable of turning about the wiper 21 for enabling

them to be adjusted for the size of shoe, the said guiding means together with the wipers 19 being moved forward in a straight line during the wiping motion by the action of the cam 1. The wiper 21 is screwed to the middle of the body of the guiding means so as to move forward with the wiper plates 19. The plates 19 and the wiper 21 come into action after the heel part of the shoe has been gripped by the resilient heel grip member 59 and work just sufficiently high above the level of the insole tacked on the last to bend the upper over the insole and apply sufficient pressure to it to lay the margin of the upper tightly over the insole ready for tacking it on.

The resilient heel grip member, 59 as shown in Fig. 4, in addition to being acted on by the jaws 68, 69, is also acted on by presser members 60 which are pivoted on pins 61 on a pair of scissors-like levers 62 pivoted on a central pin 63 fixed on the toothed rack 64. This rack is mounted on the frame of the machine and its teeth mesh with a pinion fixed on a shaft 23 (Fig. 1) which is turned by means of a hand lever (not shown). The presser members 60 are caused to bear resiliently against the heel grip member 59 by means of hollow tumblers 65 which are slidable in the arms 165 of a yoke forming part of the rack 64 against the force of helical springs 66, the outer ends of which bear against abutment screws 67.

At the lower ends of the heel grip member 59, which is U-shaped, are provided additional jaw members 72, 73 which apply pressure to the said lower ends. The jaw members 72, 73 are pivotally connected by means of pins 48 to the supports 47 of a pair of lateral wipers 49 the said pins being fixed on carriers 481 which are slidable on the supports 47 and are secured in the adjusted position by means of screws 50. The wipers 49 are fixed to the supports 47 and co-operate with the lower ends of the heel grip member 59 to smooth out any wrinkles which may appear in the upper at this point. The supports 47 are slidable endwise in housings 52 which are mounted towards their outer-ends, on pins 53 fixed on vertically adjustable bearing members 54 mounted in the frame of the machine and secured in the adjusted position by means of adjusting screws 55 in the machine frame. The housings 52 are at their inner ends pivoted on pins 58 fixed on vertical bearing rods 57 which are passed through openings 571 in the bar 572 forming part of the machine frame. The rods 57 are encircled by helical springs 56 which at one end bear against shoulders on the upper ends of the rods 57 and at their lower ends against abutment plates 157 screw secured to the underside of the bar 572. The rods 57 pass through the abutment plates 157 and at their lower ends are provided with nuts 257 enabling the force of the springs 56 to be adjusted.

The supports 47 are reciprocated in the housings 52 through yielding driving mechanism driven from the shaft 7 on which are mounted on each side of the machine a toothed wheel 26 (Figs. 1 and 2) which meshes with a toothed wheel 27 mounted on a shaft 28 journaled in a housing 128 which also enclosed the wheel 26. The wheel 26 can be brought into and out of driving connection with the shaft 7 by means of a dog clutch actuated by a knob 31. The toothed wheel 27 meshes with rack teeth provided on a sleeve 29 which is slidable in a guide tube 30. In the sleeve 29 is a screw spindle 32 provided at its upper end with a hand wheel 33 by means of which the spindle can be turned to displace it axially with respect to the sleeve 29. The screw spindle 32 has an axial bore

through which passes loosely a rod 34, the lower end of which is screwed into a plunger 37 provided with rack teeth 38 and slidable in the tube 30. The teeth 38 mesh with a toothed wheel 39 (Fig. 3) fixed on a shaft 41 journaled in a housing 421 at the lower end of the guide tube 30. The upper end of the rod 34 is screw-threaded and the part of the rod which extends above the hand wheel 33 is encircled by a helical spring 36, the lower end of which bears against the hand wheel 33 and the upper end against a hand wheel 35 screwed on the upper end of the rod 34. Between the plunger 37 and the lower end of the screw spindle 32 is interposed a helical spring 40. The two springs 36, 40 provide a resilient driving connection between the wheel 26 and the wheel 39, the spring force of which can be adjusted in both directions to enable different kinds of shoes to be tacked on. Only the mechanism for driving the right hand support 47, is shown and it is to be understood that the mechanism for driving the other support 47 is identical.

The rotary motion of shaft 41 produced by reciprocation of the sleeve 29 is limited by a stop 42 fixed on the shaft and movable therewith between two abutment screws 43, 44 on the housing 421. The shaft 41 has also fixed on it a slotted arm 45, in the slot of which is slidable a pin 46 fixed on the support 47.

On the shaft 7 being rotated, the racks 13 are reciprocated, thereby rocking the levers 13 inwardly to apply the heel grip member against the heel part of the upper, the sleeves 29 being at the same time reciprocated in the tubular guides 30, whereby the lateral wipers on the supports 47 are moved in a straight line obliquely over the bottom surface of the shoe, and the lower ends of the elastic heel grip member 59 are also applied to the rear part of the shoe upper. By this means the upper is effectively bent over the insole and all creases at the marginal parts are smoothed out.

On the rack 64 being moved towards the shoe, the stops 51 on the wiper plates 19 strike against the angular supports 47 and depress them against the action of the springs 56. The lateral wipers 49 not only stretch the upper over the last inside and smooth the path for the wiper plates 19 but smooth out any wrinkles or folds which may be caused by the latter. To prevent these wrinkles or folds from reforming after the lateral wipers have returned to their inoperative position, the upper is secured in place by means of tacks driven in by tack driving devices 84, 86 mounted on the wiper supports 47, the said tacks being driven in simultaneously with the tacks in the heel part which are driven in by the usual tack driving means.

The tack driving devices, one of which is shown in Fig. 5 are mounted on inclined arms 147 of the supports 47, between which arms and a casing 75 slides a plunger 74. The casing 75 of each tack driving device is fixed by bolts 76 and 77 to the arm 147 and the plunger 74 is provided with a slot which is a loose sliding fit on the bolts 76 and 77. The upper end of the plunger 74 is provided with a lug 78 to which is fixed a pin 70 which is encircled by a helical spring 80 which at its lower end bears against the bottom of a bore in the casing 75. The lower end of the plunger 74 is pivotally connected by means of a pin 81 to a socket 82 which holds the tack driving member 83 which is movable in a guide in a nozzle piece 84 provided with a feed opening in communication with a bore 85 through which the tacks are

fed from a container (not shown). The lower part of the nozzle piece 84 is provided with a pair of jaws 86 for holding the tacks prior to being driven in by the driving member 83. The tacks are driven into the shoe through openings 87 in the lateral wipers 49.

What I claim is:—

1. In a heel-seat lasting machine, the combination of heel wipers for pushing the heel portion of the upper over the insole with wiper supports having lateral wipers thereon, housings for said wiper supports, said wiper supports being slidable in said housings towards and away from the insole and the upper thereon for moving the lateral wipers over the edge of the upper and the bottom of the insole and said housings being pivotally mounted on the machine so as to be capable of swinging transversely with respect to the direction of the sliding motion of wiper supports, yielding supporting means for said housings, means for reciprocating said heel wipers for laying the margin of the upper over the insole, stop members connected to said heel wipers and arranged to bear against the lateral wiper supports and rock said supports together with the housings thereof against the action of the yielding supporting means and yielding driving means for reciprocating the lateral wiper supports.

2. In a heel-seat lasting machine, the combination as set forth in claim 1, in which the driving means for reciprocating the lateral wiper supports comprise a drive shaft, reciprocable sleeves having rack teeth thereon, a toothed wheel meshing with said rack teeth and operatively connected to said drive shaft so as to reciprocate the sleeves on rotary motion being imparted to the drive shaft, a hollow screw spindle screwed into each of said sleeves, a rod passed through said screw spindle and having a plunger thereon, a spring interposed between said plunger and one end of the screw spindle, a hand wheel screwed on the end of the rod remote from the plunger and a spring interposed between said hand wheel and the other end of the spindle, so as to enable the spindle to move endwise relatively to the sleeve against the force of said springs, rack teeth on said plunger, a toothed wheel meshing with the rack teeth on the plunger and a lever operatively

connected to said toothed wheel and to the respective lateral wiper support for reciprocating the said support on the toothed wheel meshing with the teeth on the plunger having rotary motion imparted thereto by the reciprocation of the sleeve.

3. In a heel-seat lasting machine, the combination as set forth in claim 1, in which the driving means for reciprocating the lateral wipers comprise a rotary cam member, a bell crank arranged for operation by said cam member, said bell crank having a toothed segment thereon, a drive shaft having a toothed pinion thereon meshing with said toothed segment, sleeves having rack teeth thereon, toothed wheels meshing with said rack teeth and operatively connected to said drive shaft so as to reciprocate the sleeves on rotary motion being imparted to the drive shaft by said toothed segment, plungers having rack teeth thereon, toothed wheels meshing with said rack teeth, levers operatively connected to said last-mentioned toothed wheels and to the lateral wiper supports and yielding connecting means for transmitting the reciprocating motion of the sleeves to the plungers.

4. In a heel-seat lasting machine, the combination as set forth in claim 1, with an elastic U-shaped heel grip member arranged to encircle the heel portion of the shoe and having its lower ends operatively connected to the lateral wipers so as to be forced against the heel part of the shoe on the lateral wipers being moved over the edge of the upper.

5. In a heel-seat lasting machine, the combination as set forth in claim 1, in which the lateral wipers have holes therein for enabling tacks to be passed through the lateral wipers to secure the parts of the upper below the lateral wipers to the insole.

6. In a heel-seat lasting machine, the combination as set forth in claim 1, with tack-driving means on the lateral wiper supports, the lateral wipers having holes therein for enabling tacks to be passed through the lateral wipers to secure the parts of the upper below the lateral wipers to the insole.

JAN A. BATA.