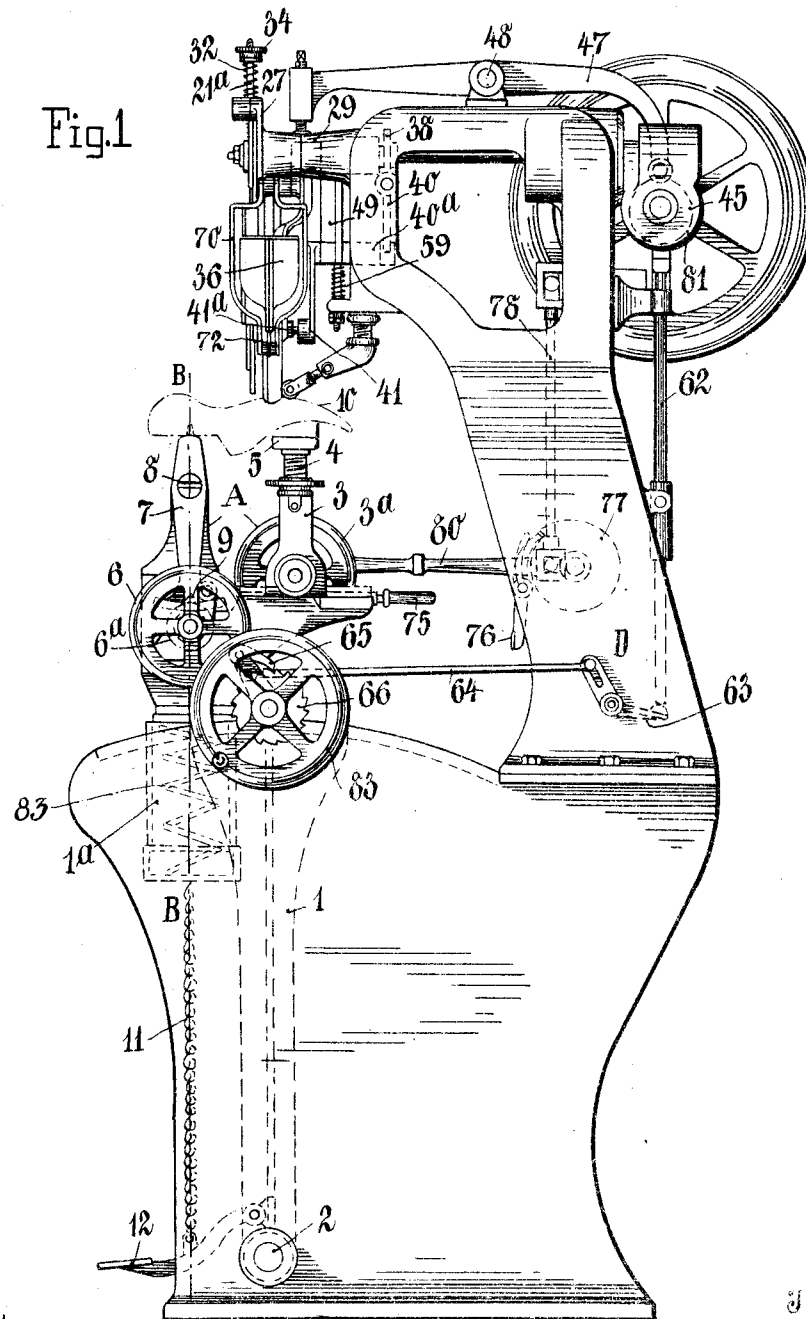


H. RAAB.
MACHINE FOR LASTING BOOTS AND SHOES.
APPLICATION FILED JUNE 22, 1911.

1,036,146.

Patented Aug. 20, 1912.
3 SHEETS—SHEET 1.

Fig.1



Witnesses
J. R. Pierce
L. O. Hilton

Inventor
H. Raab
by H. B. Willson & Co.
Attorneys

H. RAAB.
MACHINE FOR LASTING BOOTS AND SHOES.
APPLICATION FILED JUNE 22, 1911.

1,036,146.

Patented Aug. 20, 1912
3 SHEETS—SHEET 2.

Fig. 2

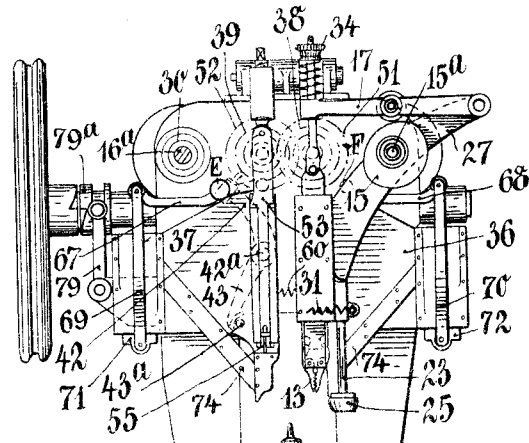
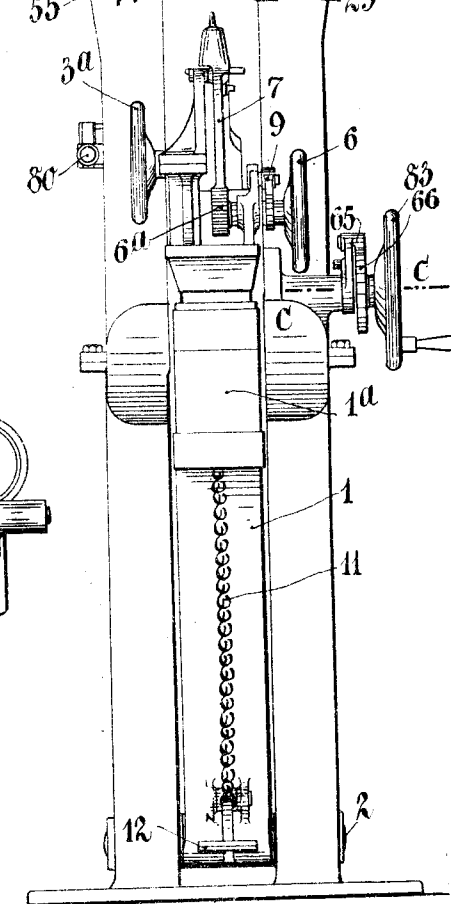
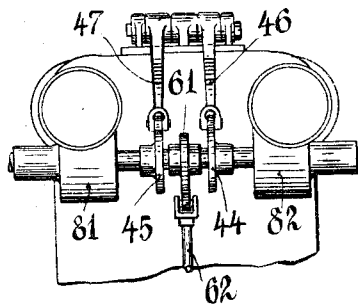


Fig. 3



Witnesses
J. R. Pierce
L. O. Hilton

Inventor
H. Raab
by *H. B. Willson & Co.*
Attorneys

H. RAAB.
MACHINE FOR LASTING BOOTS AND SHOES.
APPLICATION FILED JUNE 22, 1911.

1,036,146.

Patented Aug. 20, 1912.
3 SHEETS—SHEET 3.

Fig. 4

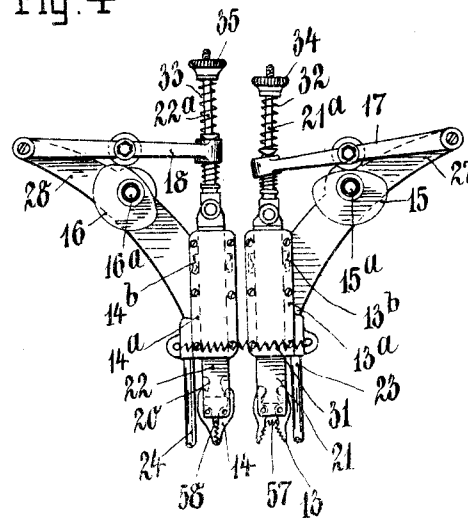


Fig. 5

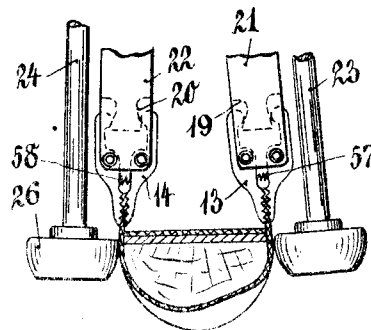
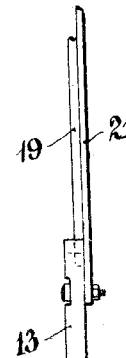


Fig. 6



Witnesses
2 R. Pierce
L. O. Kellton

Inventor
H. Raab.
by *H. W. Willson & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

HEINRICH RAAB, OF PIRMASENS, GERMANY.

MACHINE FOR LASTING BOOTS AND SHOES.

1,036,146.

Specification of Letters Patent.

Patented Aug. 20, 1912.

Application filed June 22, 1911. Serial No. 634,719.

To all whom it may concern:

Be it known that I, HEINRICH RAAB, citizen of Germany, subject of the King of Bavaria and Emperor of Germany, residing at Lembergerstrasse 64, Pirmasens, in the Kingdom of Bavaria and Empire of Germany, have invented new and useful Improvements in Machines for Lasting Boots and Shoes, of which the following is a specification.

The present invention relates to a machine for lasting boots and shoes by means of which it is possible to stretch any kind of boot or shoe over the last and to nail it to the insole secured to the last in an entirely automatic manner. This is effected without adjusting the operative parts no matter whether the boot or shoe is large or small.

An embodiment of the invention is illustrated by way of example in the accompanying drawing in which:

Figure 1 is a side elevation of the machine with the guide roll 25 (Figs. 2 and 5) omitted. Fig. 2 is a front elevation the pincers on the left hand side being omitted. Fig. 3 is a rear elevation of the head of the machine. Fig. 4 is a front elevation of the pincers with the right hand pincers open and the left hand pincers closed. Fig. 5 shows the pincers and the guide rollers in operative position, the boot and the last being shown in cross section. Fig. 6 is a side elevation of the pincers without the pincers guide.

The head of the machine is symmetrical in all its parts, that is to say, all the parts comprised on the left hand side are also arranged on the right hand side.

The numerals in brackets in the following description indicate parts omitted on one side of the drawing to enable the parts located behind them to be better seen. It is possible to do this without impairing the clearness of the drawing because as already stated the arrangement of the tools on the head is symmetrical.

After the insole has been secured to the last in the usual manner with flat headed pins the boot upper is secured thereon at the toe and at the heel and thereupon arranged on the last support A of the machine which is supported by the part 1, rockable about the pivot 2. The various sizes of boots and shoes are provided for owing to the fact that the support 3 of the last support is

displaceable in the longitudinal direction of the boot for example by means of a rack, toothed wheel and hand wheel 3^a. By setting the spindle 4, which at its upper part carries a cushion 5, higher or lower the height of the instep of the boot may be varied. The work is clamped by rotating the hand wheel 6 upon the shaft of which a toothed wheel 6^a is mounted and gears with a toothed segment 7 rotatable about the bolt 8 and holding the last above this bolt. The pawl 9 holds the hand wheel firmly in the position in which it is set. In order that the boot may invariably retain its correct position in front of the tools the entire last support is pressed upward by means of a spring 83 arranged in the cylinder 1^a cast on the part 1. By this means the insole is caused to bear against the guide roll 10 which is adjustable in the vertical direction. In order to enable the operating mechanism to follow the lateral confines of the last the last support A is also rotatable about the vertical central line B B. Before the boot is arranged on the machine the last support A is drawn downward by means of the chain 11 and pedal 12 (Fig. 2) in opposition to the pressure of the spring in the casing 1^a and this last support is only released when the toe of the boot is beneath the roll 10.

When the machine is rendered operative in the first place the pincers 13 and 14 close and seize the leather as shown in Fig. 5. This is effected owing to the fact that in the rotation of the cam plates 15 and 16 the levers 17 and 18 and with them the rear rods 19 and 20 are lifted. The dove-tail end of these rods (Figs. 4 and 5) presses the arms of the pincers apart thus closing the pincer jaws. The front rods 21 and 22 which are not connected with the levers 17 and 18 do not at first participate in the upward movement of the rear rods 19 and 20 as they are braked by springs 13^b 14^b laterally arranged in their guides. It is only upon the further rotation of the cam plates 15, 16 that the front rods 21 and 22 are also lifted thus stretching the leather. In order to hold the pincers at the correct distance from the edge of the last the guides 13^a and 14^a carrying the pincers are rockable on the arms 27, 28 about the shafts 15^a 16^a and are automatically adjusted by means of the guide rolls 25 and 26 mounted on the rods 23 and 24

(Fig. 3). The rolls may, however, be replaced by any other suitable devices which will not injure the leather. The arms 27, 28 are supported in bearings 29, 30 in the head of the machine. The rolls 25, 26 are pressed against the last by the tension spring 31 (Fig. 4). In order to prevent excessive stretching of the leather springs 32, 33 are provided on the extensions 21^a 22^a of the rods 19 and 20 and these springs can be extended by the nuts 34, 35.

When the cam plates 15, 16 have effected about one-sixth of a revolution the nailing devices 36, 37, thumb-shaped on their lower end are pressed from the side against the gradually stretching upper leather. This is effected owing to the fact that the cam plates 38, 39 by means of the levers 40 and 41 or 42 and 43 mounted at 40^a and 42^a rotate the nailing devices around their points of suspension which coincide with the axes of the cam plates. The levers 41 and 43 engage the stops 41^a and 43^a while the levers 40 and 42 are caused to bear against the cam plates 38 and 39 by the intermediary of springs. About one-twelfth of the revolution of the plates 15, 16 later a downwardly directed movement of the parts 36, 37 begins; this is possible owing to the fact that the cam plates 14, 15 (Figs. 1 and 3) rotate the levers 16, 17 about the bolts 48, whereby the levers depress the nailing devices which are not connected with the machine frame directly but by means of rectilinear guides 49 (50). As the cam plates 38, 39 must join in this downward movement their driving shafts are divided by ball joints. Owing to this vertical and horizontal movement of the nailing devices a stroking of the leather directed obliquely downward is produced so that it is drawn tightly over the last. Now as the cam plates 15, 16 have effected about one-half their revolution and the nailing devices have been completely applied so that they rest close against the leather the cam plates 51, 52 release the striking rods 53 (54) each of which at its lower end carries a hammer 55 (56). Being drawn downward by springs these hammers drive the nails in, whereupon they are at once lifted by the cam plate. The nails are fed in the following manner: By means of the cam plates 38, 39 the levers 67, 68 are simultaneously displaced about their suspension shafts E and F and draw the rods 69, 70 (Figs. 1 and 2) and the slides 71, 72 secured thereto upward. Each of these slides comprises at its upper part a slot in which the nails are suspended and at the end of the travel slide down in the channel 73, 74. When the preceding nail has been driven in and a slide drawn back horizontally by the hammer rod 53 (54) has freed the channel, the next nail falls into the nailing device where, after the hammer has

moved back, it is held by two spring bolts so that it cannot fall through. After the nail has been driven in the pincers open, owing to the fact that in the first place the rods 19, 20 move downward and the lower ends of the pincers are pressed apart by the springs 57, 58. While the pincers open the nailing devices again ascend under the influence of the springs 59 and as soon as the levers 40, 41 and 42, 43 are released they are forced apart by the compression spring 60 (Fig. 2). The boot is now entirely released by the tools and the cam 61 (Fig. 3) becomes operative and depresses the rod 62 (Figs. 1 and 3). This rod presses on the lever 63, the rod 64 displacing the pawl 65 about the pivot C C (Fig. 2) thereby rotating the ratchet wheel 66 and the toothed wheel mounted on its shaft to the extent of a given number of teeth. This gear wheel meshes with a toothed segment mounted on the arm 1 and thus presses the last support A forward to the extent of the distance between the nails. By adjusting the nut D (Fig. 1) this distance can be varied. The several movements then recommence.

When the boot has been completely lasted the lasting machine automatically comes to rest owing to the fact that the bolt 75 arranged on the last support A strikes against the pawl 76 which then releases the crank plate 77 connected to the rod 78 so that the rod 78 can be drawn downward by a spring and can disengage the lever 79 and consequently the claw coupling 79^a. When the rod 78 is drawn downward the crank plate rotates and a pin arranged on its shaft strikes against the hub of the handle 80 mounted loosely on this shaft and resting normally in horizontal position. When the machine is rendered operative, it is therefore possible to rotate the plate 77 by means of the handle 80 in the other direction until the pawl 76 again snaps into the crank plate 77, whereupon the handle 80 returns to its normal position.

The shafts carrying the cam plates 15 and 16 are driven by worm wheels mounted in the protecting casings 81 and 82. The shafts of the cam plates 38 and 39 are driven by those shafts, through spur wheels.

The last support is returned to its initial position for the purpose of removing the work by means of the hand wheel 83.

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

1. A machine for lasting boots and shoes, comprising pincers for gripping the upper on both sides of the last, a support for the shoe, nailing devices for securing the leather to the inner sole, means for pressing said nailing devices against the leather for stroking the same, mechanism for advancing said support to the extent of the desired nail

distance, and a device for automatically stopping the machine when the operation is completed.

2. In a machine for lasting boots and shoes, lasting pincers and nailing devices on both sides of the last, a last support for the shoe, mechanism for advancing said last support to the extent of the desired nail distance, and a stopping device, said last support having means for engaging said stopping device when the operation is completed.

3. In a machine for lasting boots and shoes a lasting pincers and nailing devices on both sides of the last, said pincers and nailing devices having guide members moving along the edge of the last, a support for the shoe, a mechanism for advancing said support and a device for automatically stopping the machine.

4. In a machine for lasting boots and shoes a lasting pincers and nailing devices on both sides of the last, said pincers having arms, traction rods with dove-tail shaped ends, connected with said arms, a support for the shoe, a mechanism for advancing said support and a device for automatically stopping the machine.

5. In a machine for lasting boots and shoes having lasting pincers and nailing devices on both sides of the last, a last support for the shoe, a vertical lever hinged at its lower end movable in a vertical plane, said last support being arranged on the upper end of said lever, a spring for pressing said last support upward, mechanism for advancing said last support, and a device for automatically stopping the machine.

6. In a machine for lasting boots and

shoes, lasting pincers and nailing devices, a support for the shoe, a vertical lever hinged at its lower end, a toothed segment near the upper end of said lever, a gear meshing with said segment, said shoe support being arranged on the upper end of said lever, a shaft, a ratchet wheel on said shaft, said gear being mounted on said ratchet wheel shaft, shaft bearings for said shaft on the machine frame, a pawl engaging said ratchet wheel and hinged on the machine frame, a rod moved by the main shaft of the machine, said pawl being connected to said rod.

7. In a machine for lasting boots and shoes, lasting pincers and nailing devices, a support for the shoe having an adjustable bolt, a pawl of the same height as said bolt, said pawl being hinged on the machine frame, the bolt being adapted to abut against said pawl, a crank plate having its bearings on the machine frame and being normally held against turning in one direction by said pawl and being released when said bolt abuts against said pawl, a rod connecting said crank plate with the main coupling of the machine, and a spring for pressing said support upward, said coupling being disengaged when the released crank plate turns under the weight of said connecting rod and under the pressure of said spring.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HEINRICH RAAB.

Witnesses:

HEINRICH THEILMANN,
FRIEDRICH MÜLLER.