

P. BOHÁČEK.

PULLING OVER AND TOE LASTING MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES.

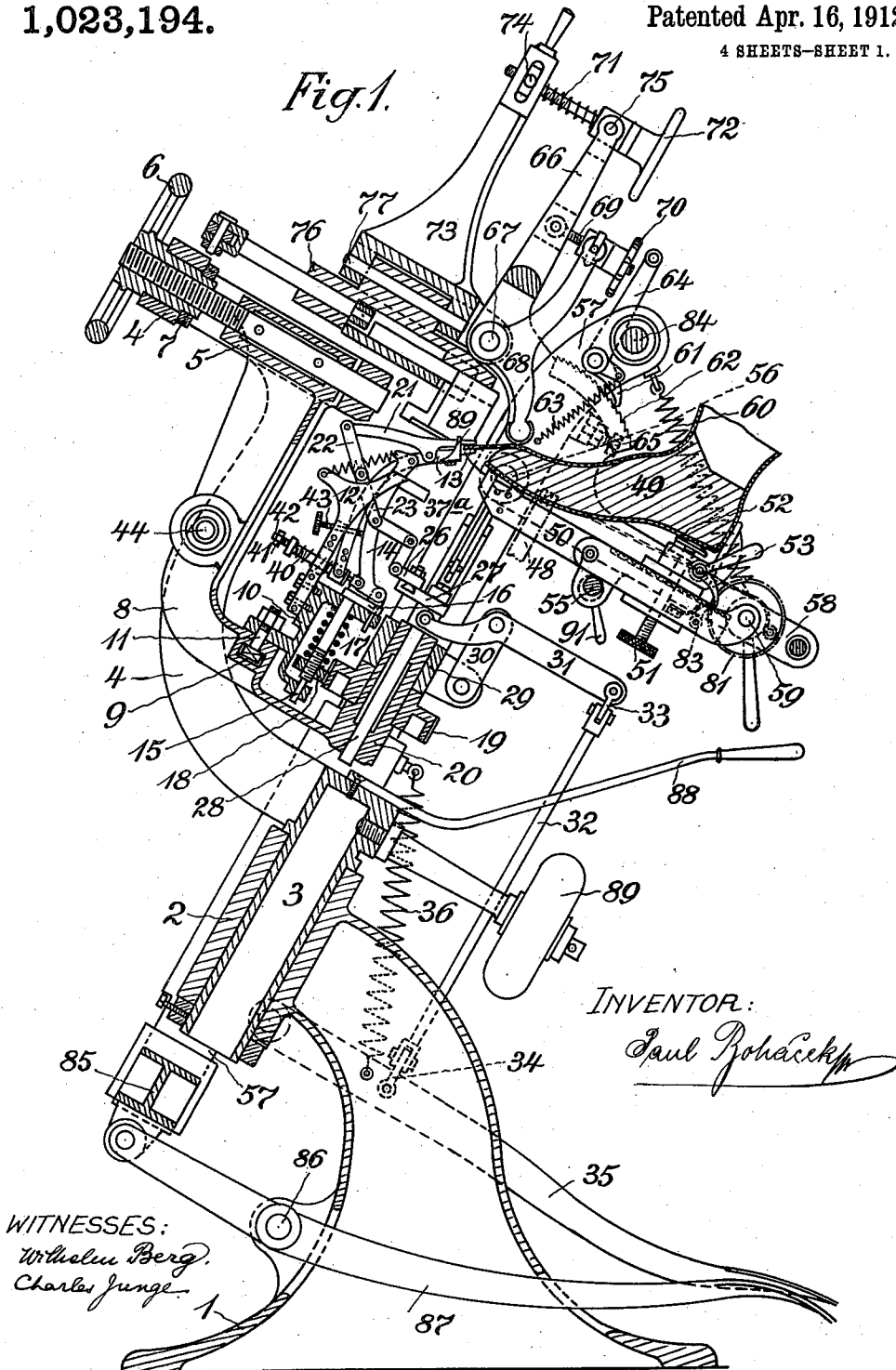
APPLICATION FILED JULY 11, 1911.

1,023,194.

Patented Apr. 16, 1912.

4 SHEETS—SHEET 1.

Fig. 1.

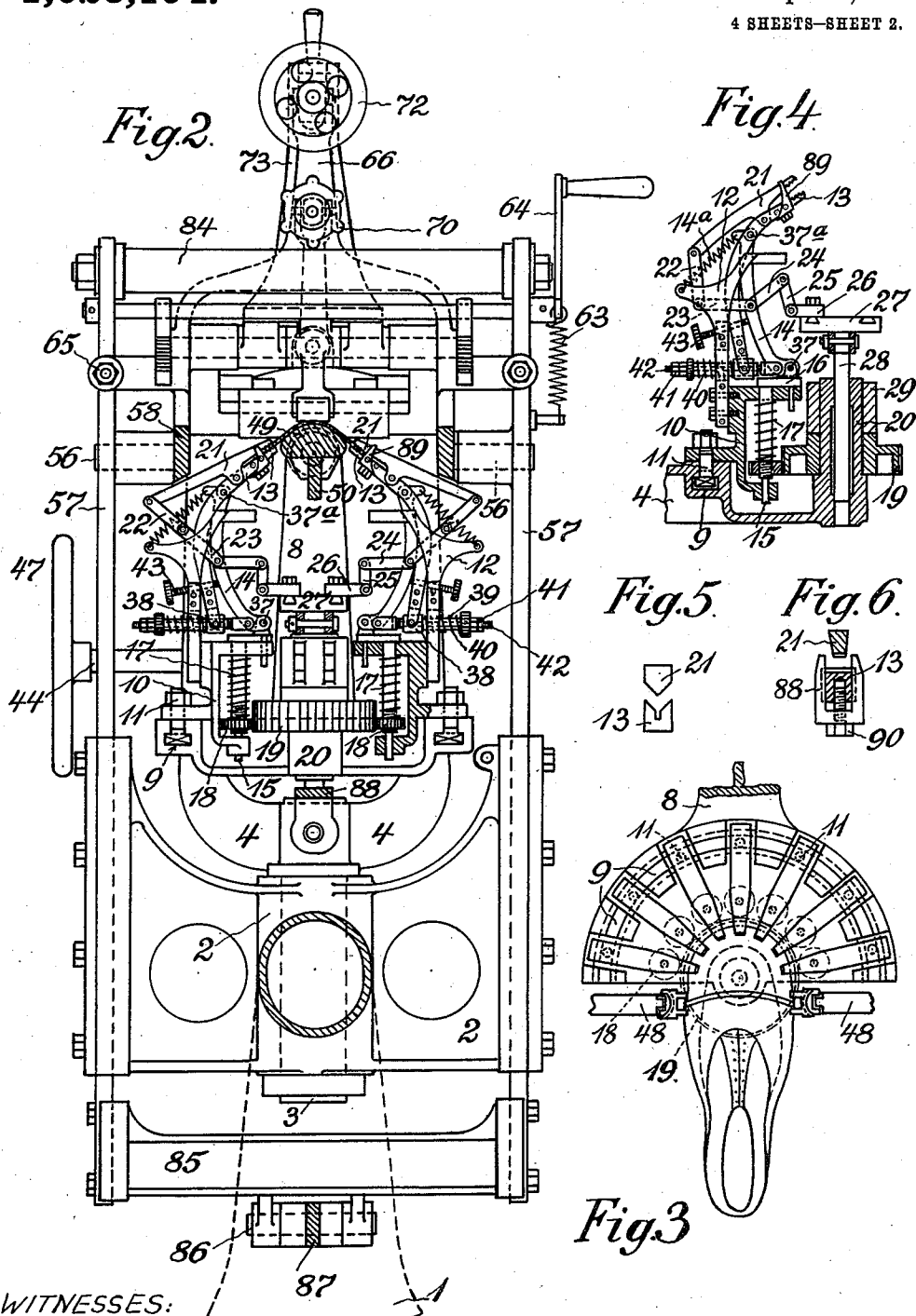


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WITNESSES:

Wilhelm Berg.
Charles Jung.

INVENTOR:

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4 SHEETS—SHEET 3.

Fig. 8.

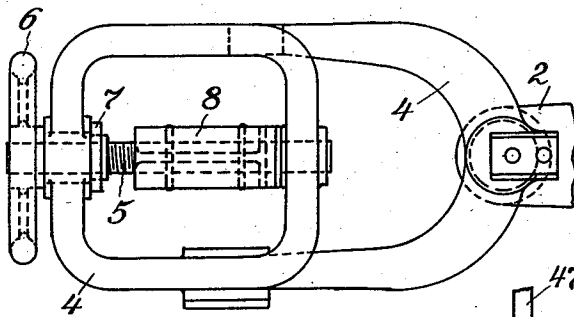


Fig. 7.

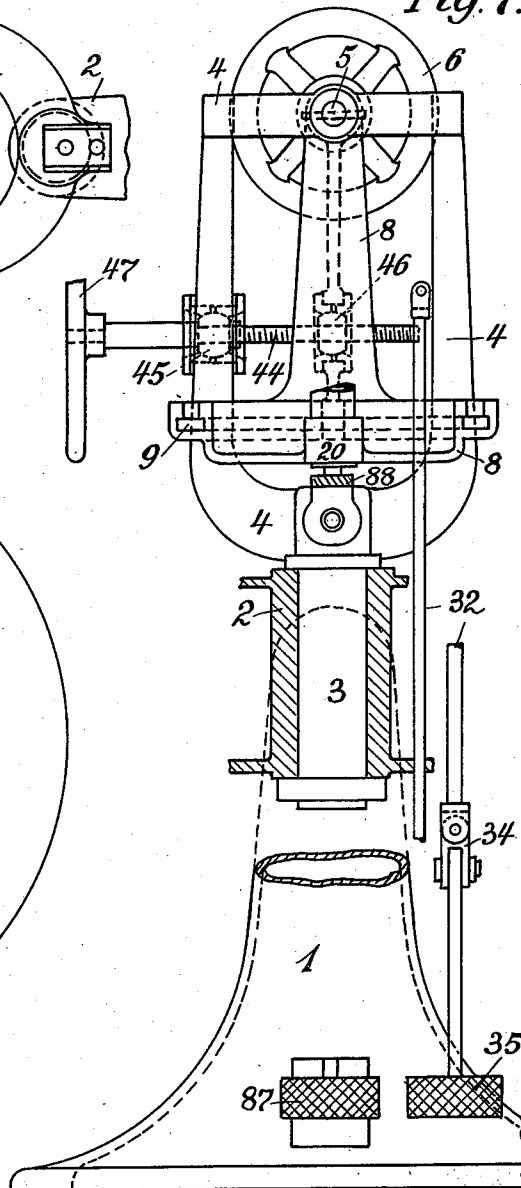
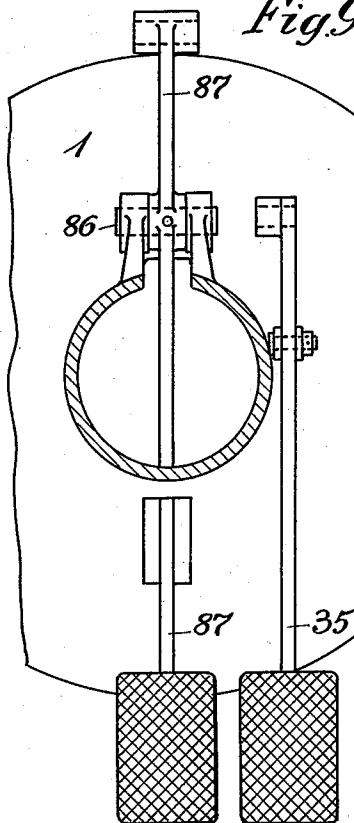


Fig. 9.



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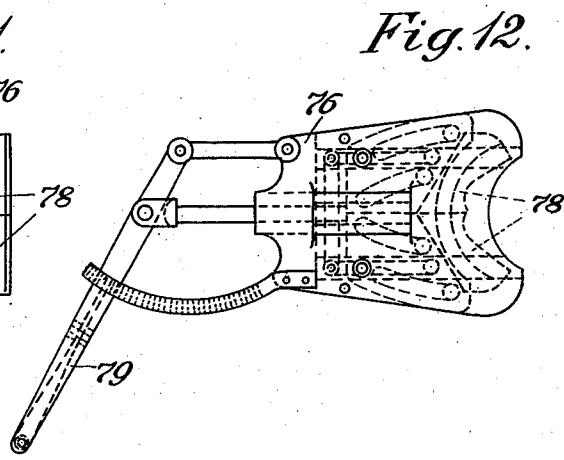
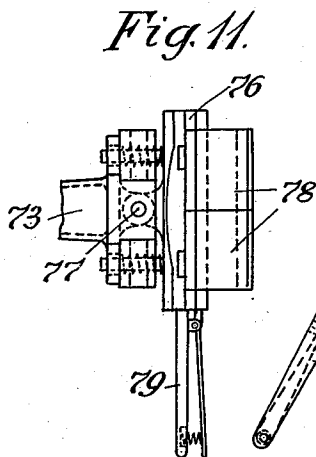
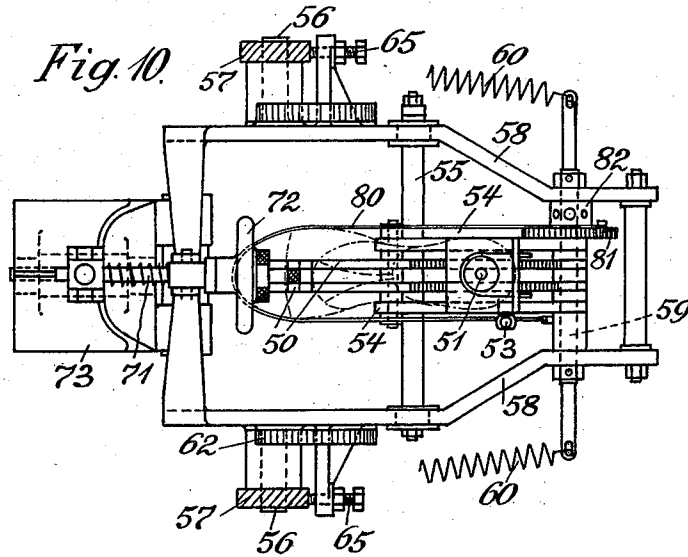
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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PULLING-OVER AND TOE-LASTING MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES.

1,023,194.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PAUL BOHAČEK, a subject of the Emperor of Austria-Hungary, residing at 63 Moltke Allee, Frankfort-on-the-Main, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in Pulling-Over and Toe-Lasting Machine for Use in the Manufacture of Boots and Shoes, of which the following is a specification.

This invention consists in improvements in machines for pulling-over and lasting the uppers of boots and shoes (especially in welt work) by means of pulling-over and tacking members on both sides of the last and of a special device for dealing with the toe end, whereby the operations are facilitated, the said means permitting of properly positioning the upper relatively to the last in three directions at right angles to one another or approximately so, and also of laying the edge of the upper on the toe in small plaits; in addition to this the pulled-over upper which is temporarily held in its position for binding-in, can be turned with the last, so that the surface of the last is upward and the work can be tested and the subsequent binding-in of the upper with the toe end, by means of wire, or lacing, can be done. The device for positioning the upper in three directions at right angles to one another is characterized by a kind of Cardan joint, within which the pincers which seize the upper at the toe are held in position and can be displaced relatively to the last. The pincers are arranged in a group around the toe end, and some, or all, of them can be arranged to yield in the direction of the pull. They bear a definite relation to the wipers at the inner sole, so that, during the advancement of the wipers, the pincers move in guides nearly radial to the work and lay the edge of the upper in suitably distributed short plaits, which do not extend to the edge of the last and are not visible in the finished boot, or shoe.

Further improvement of the machine consist in the special construction of the pincers which may be either moved independently of one another or be all moved together, the construction and arrangement of the pincers being such as to suit the quality of the leather employed.

By means of the improvements the upper

is fully pulled over, the toe being thoroughly dealt with and no further subsequent operations, such as are required in pulling-over machines as hitherto constructed, are required.

In the accompanying drawings, Figure 1 is a vertical side elevation partly in section of a machine constructed in accordance with this invention, and Fig. 2 a front view (partly in section) of the main parts of the machine, the last being shown in section. Several of the pincers are omitted from these two figures, for the sake of clearness. Fig. 3 shows diagrammatically, in plan, the arrangement of the pincers, Fig. 4 shows in side view a pair of pincers in the open position, Figs. 5 and 6 show forms of pincer jaws seen from the front, Fig. 7 is a front view, and Fig. 8 is a plan of the principal parts which hold and operate the pincers. Fig. 9 shows a part plan of the lower part of the machine framing, and two treadles. Fig. 10 shows, in plan, the frame, and the support proper, for the last, and the binding-in device. Figs. 11 and 12 show, in views, at right angles to each other, the construction of the wipers.

The upper part of the base frame 1 is formed with a socket bracket 2, which receives the stem 3 of a two-armed supporting body 4, the upper part of which constitutes a closed frame carrying a screw-spindle, or pivot 5, in engagement with a hand-wheel 6, formed with a nut, prevented from moving forward by a collar 7, so that, on turning the hand-wheel 6 the screw spindle 5 is moved longitudinally. From the said spindle is suspended a supporting arm 8, which is enlarged at its lower part and provided with a curved groove 9 which corresponds to the nearly semicircular shape of the toe of the boot, or shoe, and receives the supports of the group of pull-over pincers which are so guided that they always occupy radial relative positions, their movement relatively to the work taking place radially.

Each pair of pincers is secured to a base-piece 10 which can be adjusted and fixed in the curved groove 9 by means of a bolt and nut 11 and carries a pincers support 12 consisting of two flat members. Within this support 12 is a link 14 pivoted at its upper end to the lower pincers jaw 13 and at its lower end to the head-plate 16 of a

bolt 15 carried in the base piece 10, the upper end of the link 14 being connected to a spring 14^a secured to the support 12. The bolt 15 is surrounded by a spring 17 which bears, at one end, on the base piece 10, and at its other end against a pinion 18 mounted on a screw on the bolt 15 and thus presses downward the link 14 and consequently the pincers so that they can follow the pull exerted on the leather during the pulling-over operation. Each of the pinions 18 belonging to the several pairs of pincers gears with a toothed wheel 19 rotatably mounted on a hollow projection 20 on the supporting arm 8. When the toothed wheel 19 is turned, the tension of all the springs 17 is uniformly regulated. In order that the opening and closing of all the pincers may be effected at once, the upper jaws 21 of the pincers are connected to the link 14 by toggle-links 22, 23, which, in their turn, engage by means of the links 24, 25, with sliding blocks 26, the links 23 and 24 being rigidly connected. By means of dovetail projections, the block 26 engages a semi-circular groove in a plate 27 which is carried by a pin 28 capable of turning within the hollow projection 20. On the projection 20 is a collar 29 carrying a lever 30 which supports a lever 31, one arm of which bears upon the underside of the plate 27, the other arm being connected by the rod 32 and links 33 and 34 to a treadle 35, which is normally held upward by the spring 36. When this treadle 35 is depressed, the pincers are all simultaneously opened, while they close when the treadle 35 is released. The pincers are separately adjustable radially relatively to each other for the purpose of adapting them to the particular shape of the last in use while they also act yieldingly in the same direction. For this purpose the link 14 mounted on the center-pin 37 of the head plate 16 and carrying the lower jaw 13 (*i. e.* the whole jaw) can rock on the pin 37. The lower end of the jaw 13 is connected to a collar 38 slidably mounted on a sleeve 39 and acted upon by an adjustable tension spring 40. The sleeve 39, together with the collar 38 and spring 40 being passed over a bolt 42 and held thereon by a nut 41 pivoted to the link 14. An adjusting screw 43 passes through the lower part of the jaw 13 and bears against the part 14. By operating this screw 43 the pincers can be adjusted, *i. e.*, set at an angle on the center pin 37^a, the spring 40 furnishing elastic support so as to be capable of effecting a further small oscillation, corresponding with the tension of the spring 40, which further small oscillation may be required on account of the thickness of the leather.

In the example shown in the drawings, the group of pincers is composed of seven pairs, the greater part of which have been

omitted from Figs. 1 and 2 for the sake of clearness. Of course in accordance with this invention a greater, or lesser, number of pairs of pincers may be used in accordance with the required number of plaits to be formed around the toe end. In order to increase the number of plaits in the leather with a lesser number of pairs of pincers, the jaw of the pincers may be given the forms shown in Figs. 5 and 6. One of the jaws (13) of the pincers is provided with a longitudinal V-shaped groove with which the other jaw 21 engages, so that the leather seized will be plaited within the pincers. For the purpose of increasing at the same time their holding power, the pincers may have the profile shown in Fig. 5. In the form shown in Fig. 6, the jaw 21, has an operating surface which is narrower than that of the other jaw which is adjustably held in a stirrup 88, and which passes over the jaw 21, so as to cause the leather to be plaited. The stirrup 88 is arranged so as to be rendered, in a simple manner, independent of the stop 89 (Fig. 4) provided for limiting the length of the grip of the pincers, and the said jaw can be adjusted by means of an adjusting screw 90, whereby alteration of the depth of the plait can be effected.

The group of pincers can, in addition to the alteration of position effected by the shifting of the arm 8, longitudinally to the last, also accomplish an oscillating motion on the pivot 5, for the purpose of shifting the upper over the toe during the adjustment transversely to the longitudinal axis of the last. This is rendered possible by a screw spindle 44, passing through a spherically shaped piece 45, mounted in bearings in the supporting body 4, and screwing through a spherical nut 46 carried on the supporting arm 8 of the group of pincers. On turning the spindle 44 by means of the hand-wheel 47 (Fig. 7) the position of the group of pincers can be altered as desired in the aforesaid manner.

In addition to the group of pincers, further pincers, or gripping devices, 48 (Figs. 1 and 3) of any known, or suitable, type may be provided; which, as in ordinary pulling-over machines, come into action and accomplish the tacking of the firmly pulled-over upper into the inner sole. The devices for operating these last named appliances are not shown in the drawings, as they may be of the usual kind.

The last stands up in the machine, so that the sole is downward. In the proper operating position, the center line of the spindle 5 lies in the same direction as the longitudinal axis of the last, while the perpendicular, or nearly perpendicular, pivot 3 is in such position that its produced center line passes approximately to the middle of the front cap

of the shoe, and the produced center of the spindle 5 intersects with the produced axis 28 of the group of pincers at a point at the center line of the sole of the last, through 5 which point passes also a further center line of a bearing 56, hereinafter described, and serving as a tilting axis for the last and work. In consequence of this peculiar axial arrangement it is possible to always effect in 10 a uniform ratio changes of position of the group of pincers relatively to the work, as well as changes of position of the individual pairs of pincers in all directions running from an imaginary point, so that the upper 15 leather can be adjusted and positioned as required for the proper treatment of the toe part.

The toe end of the last 49, and work, rest on the small supporting surface of rails 50 20 (Figs. 1 and 10) the upper sides of which are provided with ratchet teeth, over which a heel supporting body 52, provided with an adjusting screw 51, can be adjusted and held in position by means of a locking device 53. 25 The rails 50 are connected by two articulated levers 54 and rest on a cross-bar 55 which is eccentrically formed at the ends and can be turned, by a lever 91, for the purpose of raising, or lowering, the sole support. 30 The cross-bar 55, is mounted on a supporting frame 58, resting in a framing 57, in which frame 58 the levers 54 are held in an axis 59. The center line of the pivot 56 lies in the vicinity of the cap seam, so that the 35 last and work can be brought into an inclined position by turning the supporting frame 58, and the preliminary pulling-over can take place. Two springs 60, secured to the frame 57, constitute a yielding support 40 for the frame 58, which is held in its inclined positions by means of the pawl 61, engaging a rack 62 and acted upon by a spring 63 and capable of being released by the hand-lever 64. The swinging motion of 45 the frame 58 is limited by screw stops 65 which bear on the frame 57.

Above the pivot of the frame 58 is a lever-shaped extension 66 carrying a pin 67, on which is pivoted a lever 68, acting as a 50 presser, which can be adjusted by means of screw 69, pivoted on the arm 66, and operated by a hand-wheel 70. To the pin 67, is also connected a device for pressing on the inner sole the upper pulled over by the pin- 55 cers, the said device acting in the usual manner on the work by means of wipers moved sidewise to one another (Figs. 11 and 12). The whole device can, for the purpose of adapting it to the work, be turned on the 60 pin 67, by means of a screw 71, and a small hand-wheel 72. The screw 71, enters a nut 74, provided in the support 73, and is surrounded by a spiral spring which constantly keeps the hand-wheel in contact with the 65 bearing 75 of the screwed spindle which

bearing is mounted in the arm 66. The support 73 can be moved by hand against the pressure of the spring, thereby lifting the wipers away from the work. The wiper proper consists of the casing 76, mounted so 70 as to be capable of swinging transversely to the longitudinal axis of the last, on a pin 77, in the support 73. The casing carries in its inside the two wiper jaws 78. The movement of the wipers is effected by the hand- 75 lever 79.

For the purpose of binding-in the edge of the upper, pressed down by the wiper jaws 78, with wire, or cord, an auxiliary device is provided as illustrated by Figs. 1 and 10. 80 In this arrangement a wire 80 in the shape of a loop is used, which wire is at one end fastened directly to the pin 59 of the carrying frame 58, while the other end is connected to a toothed disk 81 provided with a 85 collar 82, with holes permitting of turning the disk 81 by means of a lever and thereby pulling the loop. A pawl 83 prevents the disk 81 from turning back. As soon as the fixing of the pulled over upper leather has 90 been effected by pulling the loop; and the other pulling-over pincers 48 and their tacking devices (Figs. 1 and 3) have performed their work, the group of pincers at the toe end can be thrown out of action. The last 95 and work end of the supporting rails can be turned to the front on the pin 59 in such a way that the sole is directed upward, whereupon the final binding means to be used (wire, or cord) can be pulled around the 100 upper leather plait. The two ends of this wire, or cord, are secured to pegs driven in the vicinity of the cap seam, or each end may be wound around tacks which have not been fully driven in by the tacking devices 105 of the pull-over pincers. The wire loop 80 can be again loosened and the pulled-over, and tacked boot, or shoe, on the last can be removed from the machine.

The auxiliary devices consisting of the 110 upper last presser 68, and the wiping and binding devices, form in some measure, with the last carrying frame 58, a whole and participate in the movements of the latter device and can be adjusted also at right- 115 angles to the work. For this purpose the framing 57, which holds the frame 58 and consists of two side rails with an upper cross bar 84 and a lower one 85, is guided in the part 2 of the standard 1. The lower 120 cross bar 85 is connected to a treadle 87, fulcrumed at 86, by which treadle the vertical movement of the frame 57 is effected.

The operation of the hereinbefore described machine is as follows:—The operator 125 places the last 49 and the ready cut upper on the last supporting rails 50 and introduces the edge of the upper into the pincers which he has opened. Then the pincers are closed and the operator, by means of the 130

foot-lever 87, raises the last into the upper. By this means he can, according to requirements, adjust the upper last presser 68. He will then test whether the upper is properly positioned. If he finds that the cap seam is not at right-angles to the longitudinal axis of the last, the whole group of pincers can be readily and quickly turned accordingly on the post 3. The handle 88 is provided, for this purpose, on the supporting arm 4. The balancing weight 89, assists in this turning operation. By turning the shoe uniformly on the axis 56, the proper adjustment of the cap length can be obtained. If the upper requires to be shifted to one side, or the other, the whole group of pincers is turned on the part 5, to the required extent. When the upper is finally adjusted, a depression of the treadle 87, will pull on the upper leather powerfully so that the tension comes out of the leather and it lies smoothly on the last. Then the two wipers 78 are advanced by means of the hand lever 79, and thereby the upper leather is pressed around the edge of the inner sole, the pincers being capable of following the pull on the leather. The upper is then completely pulled over, and only the binding-in as yet to take place. For this purpose the whole of the pincers are first opened and the wipers raised a little, the loop 80 is passed around the toe of the boot, or shoe, and powerfully drawn. Next the work and its support are turned on the pin 59, so that the sole is directed upward. After this the operator drives, in the part of the work corresponding to the vicinity of the ball of the foot, say two tacks and passes the binding wire, or cord, proper around the pulled over edge of the upper and winds the ends of the wire, or cord, around the tacks. The binding loop 80, can then be loosened and the work is removed from the machine.

45 I claim:

1. In pulling over and toe lasting machines having a group of toe pincers suitably mounted, links 14, toggle links connecting link 14 to the upper jaws of each

of said pincers, sliding blocks, other toggle 50 links connecting said blocks to said link 14, a plate 27 engaged by said blocks, a pin 28, carrying said plate, a hollow projection in which said pins turn, a collar on said projection, a link 30 on said collar; a lever 31 55 supported by said lever 30; one arm of said lever 31 engaging the under side of said plate 27, a treadle and a rod and links connecting the other arm of said lever with said treadle. 60

2. In a pulling over and toe lasting machine, toe pincers, an adjustable link 14 supporting said toe pincers, a center pin upon which said link is mounted, a bolt pivoted to said link, a sleeve on said bolt, a collar 65 slidably mounted upon said sleeve, said collar supporting one of said pincer-jaws and a spring mounted upon said sleeve and adapted to act upon said collar.

3. In a machine of the character described, a group of pincers, means to operate said pincers comprising a substantially horizontal pivotal support 5, a screw spindle 44, a spherical shaped piece 45, a supporting body 4 on which said piece 45 is mounted and through which said spindle passes, 75 a spherical nut 46 which is also pierced by said spindle, arms carrying said nut, and a wheel to turn said spindle as described.

4. In a machine of the character described, rails on which the toe end of the last rests, articulated levers connecting said rails, a cross-bar 55 eccentrically formed on which said levers rest and a lever 91 to turn said cross-bar, as described. 85

5. In a machine of the character described, rails adjustably mounted to support the last, pincers engaging the shoe upper, means actuated by a foot lever to raise the last into the upper, an adjustable upper 90 last presser mounted adjacent the shoe toe, a pivotal post 3, supporting said mechanism and a handle 88 to operate said post.

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Witnesses:

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