

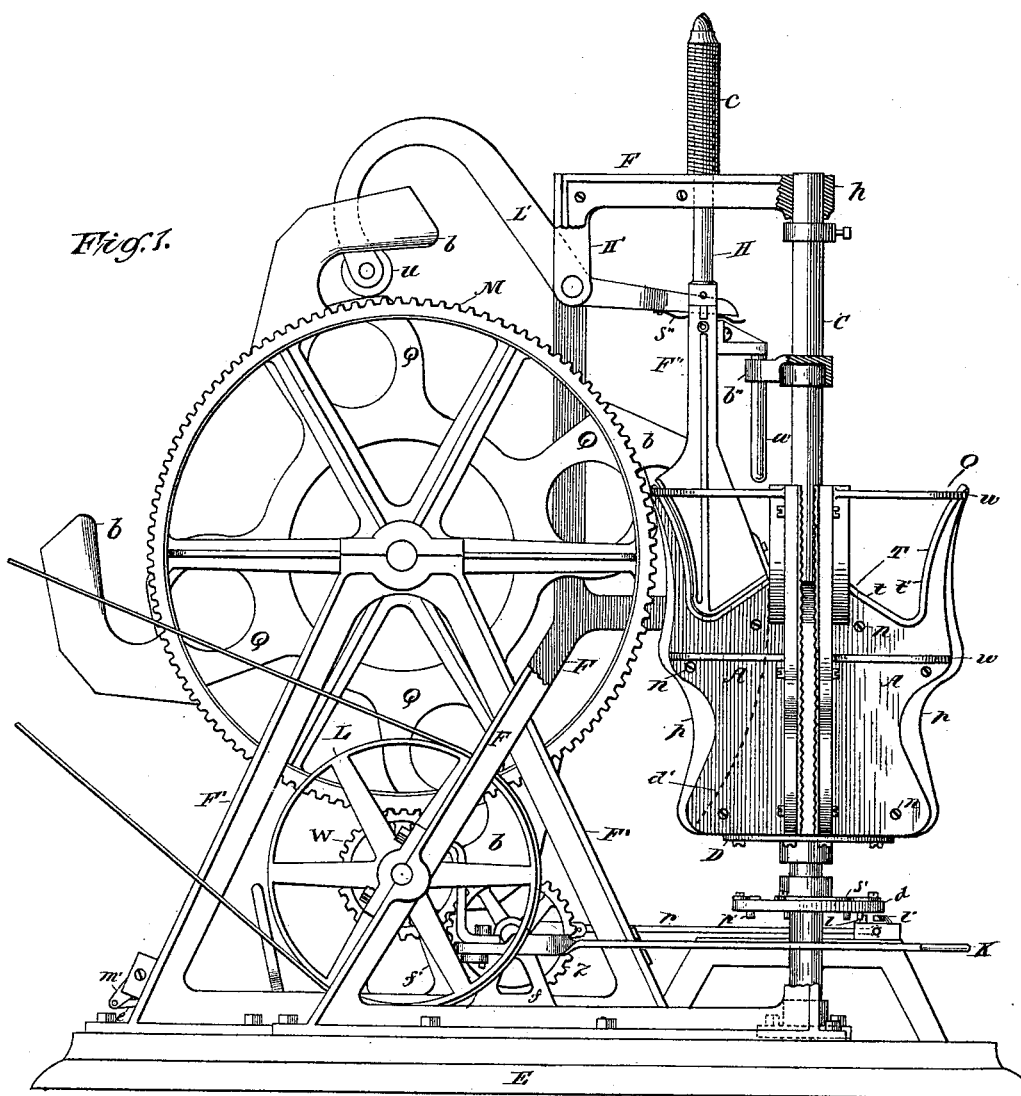
(No Model.)

4 Sheets—Sheet 1.

J. F. K. O'CONNOR.
LEATHER CRIMPING MACHINE.

No. 386,652.

Patented July 24, 1888.



WITNESSES:

C. W. Benjamin
Wm. J. Butler

INVENTOR

J. F. K. O'Connor.

(No Model.)

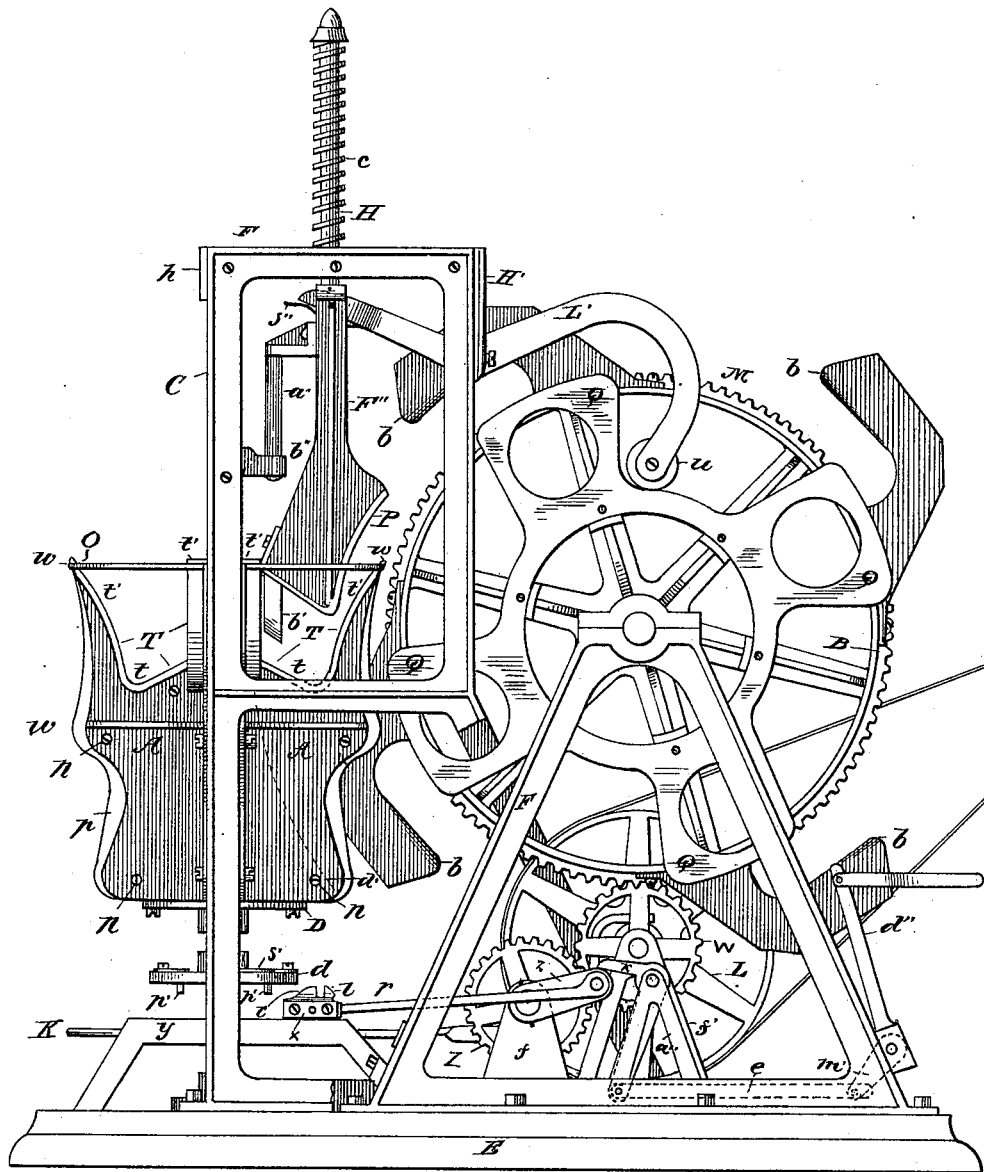
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Fig. 1^a.

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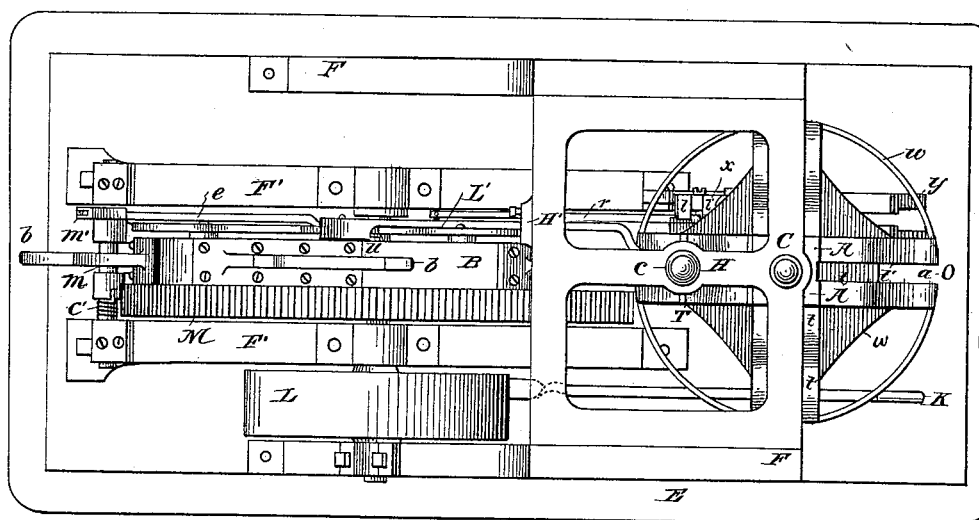


Fig. 2.

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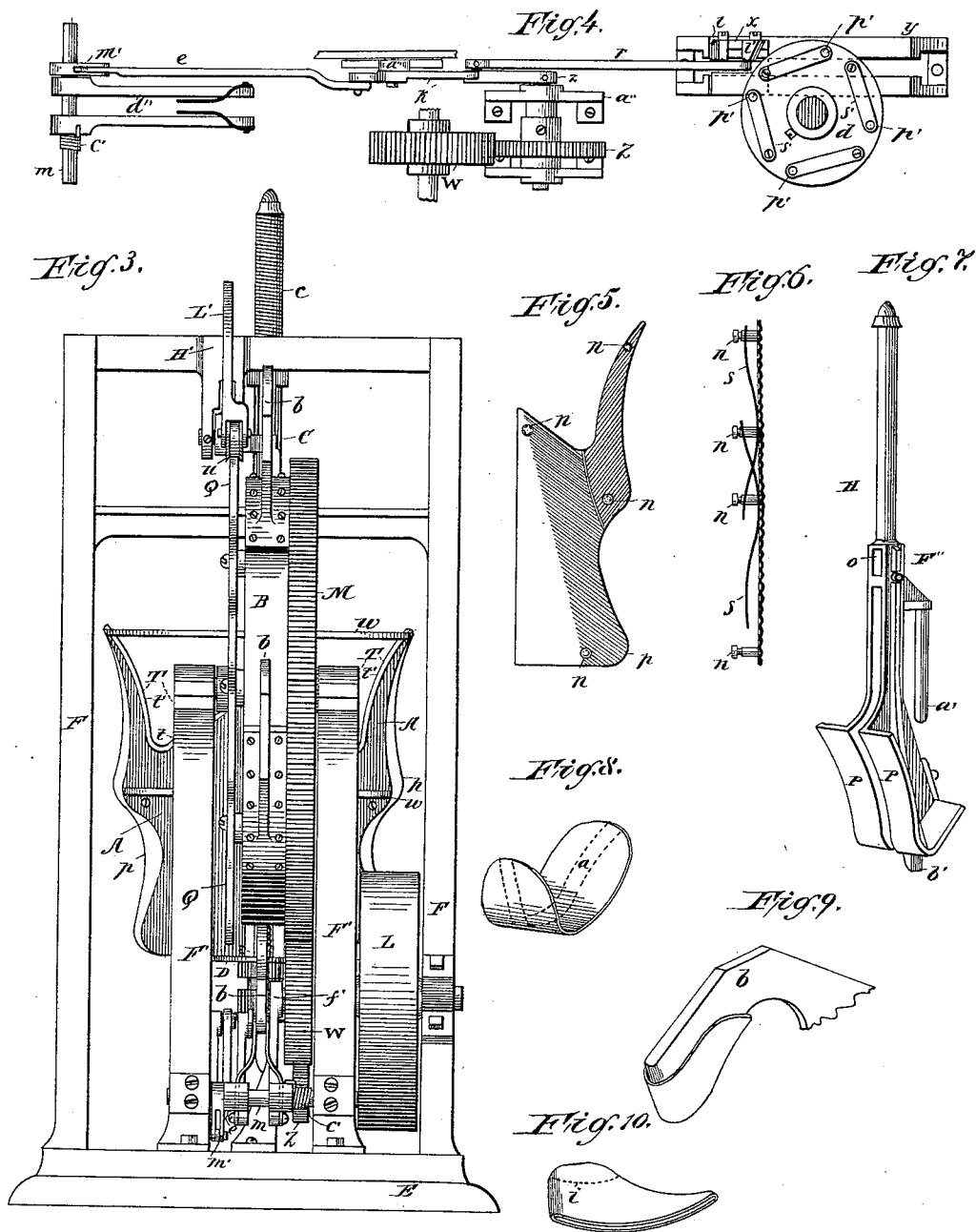
(No Model.)

4 Sheets—Sheet 4.

J. F. K. O'CONNOR.
LEATHER CRIMPING MACHINE.

No. 386,652.

Patented July 24, 1888.



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INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN F. K. O'CONNOR, OF YONKERS, ASSIGNOR TO THE "UNIVERSAL"
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LEATHER-CRIMPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 386,652, dated July 24, 1888.

Application filed April 6, 1888. Serial No. 269,840. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. K. O'CONNOR, a citizen of the United States, residing at the city of Yonkers, in the county of Westchester and State of New York, have invented a new and useful Machine for Crimping the Uppers of Foot-Wear, of which the following is a specification.

My invention is illustrated in the accompanying drawings, which form a part of this specification, in which—

Figure 1 is a side elevation of my machine with a portion of the frame removed. Fig. 1^a is an elevation of the opposite side with a portion of the frame removed. Fig. 2 is a plan view. Fig. 3 is a rear end elevation. Fig. 4 is a detailed plan view of the pawl and ratchet which move the mold-block and of the device which operates the delivery fingers. Fig. 5 is an inside elevation of one of the corrugated removable plates attached to the opposite inner walls of the mold. Fig. 6 is a front elevation of one of these removable plates, showing its relieving-springs and screw adjustments. Fig. 7 is a perspective of the press-plates, which are lowered upon the upper when the latter is in position to be crimped. Fig. 8 is a perspective view of a shoe-upper in condition to be crimped, showing by dotted lines its relation to the mold. Fig. 9 is a perspective view of a crimped upper on the plunger after leaving the mold. Fig. 10 is a perspective view of a crimped upper removed from the plunger.

Similar letters indicate similar parts in the several views.

The object of my invention is to provide a machine which primarily will economize material, labor, and time in the crimping of the uppers of seamless foot-wear and distribute the crimping through the whole of the upper, and which again may be economically employed for crimping uppers which are constituted of parts.

In the preferred form the invention consists of a series of revoluble molds combined with a series of plungers arranged to successively co-operate with the molds to crimp uppers as the said molds in their rotation are brought one after another into operative juxtaposition with the plungers. The number of molds and

plungers used is optional. If it should be desired to use a single mold in connection with one or more plungers, the mold may be stationary or revoluble, as desired; but the plungers, in whatever number used, will be rotated.

The invention also consists in certain details of construction and in the combinations and arrangements of parts, hereinafter more particularly set forth and claimed.

In the embodiment of my invention selected for illustration in the drawings four molds and four plungers are employed. These, as also all other portions of the machine, are constructed of any fit material desired.

A mold-block, A—say of cast-iron—is made with four similar vertical wings, radiating at equal distances apart from a common center and containing the molds *a*, which are made as vertical recesses in said wings. The mold-block is firmly attached to the vertical shaft C, which passes through its center.

The molds are formed by cutting a simple vertical channel in each wing from top to bottom in line with the revolving shaft C. The walls of all the molds will be, therefore, in every way symmetrical. The width of these channels or molds is uniform and their depth at their mouth somewhat greater than the length of the shoe-uppers that are to be crimped. The profile of the wings is two curved lines, the upper curve being such as to bring the mold as close as possible to the master-wheel M and its drum B, to which the plungers *b* are attached, and the lower one conforming to the profile of the bottom of a crimped upper from the toe to the heel, so that all points in this bottom line of the upper, which passes last from the mold, will leave it simultaneously.

An essential feature of the mold is that its channel is open, not only at both ends, but also on the side next the plunger, for a purpose presently appearing.

The inner faces of the two opposite vertical walls of the molds may be either plain or corrugated. In the drawings they are shown as corrugated. The walls of the molds in either case consist of removable plates *p*, which are secured in place and adjusted by screws *n*. Between these removable plates and the supporting-walls of the mold springs *s*, of steel or

any other fit material, are placed, which, co-operating with the corrugations of the plates in the act of crimping, relieve the leather of the otherwise unyielding rigidity of the mold, thus favoring the passage of the leather through the mold and guarding it against tearing. The disposition of the corrugations upon the plates is such as to provide for their most efficient work.

A table, T, is formed with or fitted to the walls of the mold at its mouth, on which the upper of the shoe to be crimped is placed. The mouth of the mold extends up through the middle of this table. The profile of a side elevation of the table shows a plane inclined surface, *t*, and an upright curvilinear surface, *t'*, the line of meeting of these surfaces being at right angles to the walls of the mold. The profile of the mouth of the mold corresponds, therefore, with the profile of the face of this table. The portion of the mouth of the mold which lies in the plane surface of the table co-operates with the plunger to give form to the heel of the crimped upper, and the portion which lies in the curved surface co-operates with the plunger to give form to the front of the crimped upper from the instep to the toe.

The walls of the molds are guarded from springing apart during the process of crimping by the braces or webs *w*.

The mold-block rests upon and is bolted to the circular bracket D, which is firmly secured to the shaft C. The foot of this shaft C is stepped and revolves in a foot-block attached to or formed in the bed-plate E. This bed-plate E is made of any desirable length, breadth, and thickness and upholds the frame F, the standards F', which support the master-wheel M, the bearings *f* of the mold-moving geared wheel, the bearings *f'* of the pinion W, and the support *a''* of the bell-crank *k*. The upper end of the shaft C passes through and is held in position by the hub *h*, formed in the upper portion of the frame F. As thus placed and secured, the shaft C, with the mold-block A, is revolved by means of four pawls, *p*', arranged in the circular plate *d*, which is secured to the shaft, and a single ratchet-tooth, *l*, attached to the reciprocating cross-head *x*. This cross-head is moved forward and backward upon the ways *y* by the connecting-rod *r*, whose rear end is secured to the crank *z*, attached to the mold-moving geared wheel Z, which again is actuated by the pinion W, arranged upon the shaft of the belt pulley L. This pulley takes motion for the machine from some power-shaft.

The peculiar form of pawl I prefer to use is constructed as follows: Four pawl-pins, *p'*, are arranged in holes in the circular plate *d*, bored equidistantly and near its circumference. Each of these pins is suspended at the end of a spring, *s'*. The springs are secured at their other ends to the top of the plate *d*. The pins extend below the plate *d* nearly to the cross-head *x*.

Instead of the ordinary form of ratchet I employ the before-mentioned single tooth *l*,

which is attached to the upper face of the cross-head *x* and extends about half-way across it. When the cross-head is moved backward, one of the pawls *p'* rides up the chamfered face of the ratchet-tooth *l* and drops in front of it and between it and the stop *z*. The forward movement of the cross-head then carries this pawl along with it, and at the same time turns the shaft and mold-block through the intervention of the plate *d*. When a quarter-revolution is thus described, the pawl slides out from behind the stop *z*, which is attached to the cross-head, in front of the ratchet-tooth and prevents the momentum of the mold-block from carrying it too far around. At this moment the bar *b'*, secured to and depending from the press-plates P, moves down and into the mold *a* beyond the reach of the plunger, and holds the mold-block firmly in position while the plunger enters the mold. The cross-head at the same time moves backward to engage the succeeding pawl at the proper moment and repeat the operation just detailed.

A revoluble mold-block with a series of molds will be used in the preferred form of machine, and it has many advantages, among which I mention increased output and the facility for feeding the blanks to be crimped; and in this connection I call attention to the fact that an operator can feed the machine from the front and wholly without danger to himself from the moving parts.

Having described the molds and their subordinate parts, I now proceed to particularize as to the plungers *b* and their accessories.

The profile of the plunger corresponds to the profile of the mouth of the mold, and both to the profile desired for the top of the crimped upper. The depth of the plunger is somewhat greater than the height of the upper when crimped, and its length somewhat greater than the full length of the upper. Its thickness is so much less than the thickness of the mold as to enable it to do the desired crimping of the leather as it forces it through the mold. In the drawings the four plungers correspond to the four molds. They are attached to the drum B of the master-wheel M and are located equidistantly about this drum, its axis being horizontal and at right angles with the axis of the mold-block A. Therefore, while a plunger is passing through its corresponding mold the same vertical plane which cuts each of the four plungers into two equal and similar parts also cuts each of the two opposite molds and the intervening shaft, C, into two equal and similar parts. The spaces between the two vertical faces of the plungers and the opposing faces of the mold are therefore equal. The path of the plunger in passing through the mold is indicated by the dotted line *d'*, and is an arc of a circle concentric with the master-wheel and drum, so that in describing this arc in its passage through that opening in the mold next the master-wheel the blank of the upper will be drawn and crimped about the plunger without wrinkles, and thus the

crimped upper requires no subsequent rubbing to remove wrinkles.

The master-wheel is supported by and revolves in the standard F' . It is geared with and driven by the pinion W , which, as already shown, drives the mold-moving geared wheel Z . Thus the plungers and the molds are alike revolved by the same pinion, while the communicating parts between them and it are so adjusted that the plungers and molds revolve at once about their respective axes in the same period of time.

The shaft of the pinion W revolves in journal-boxes arranged in the frame F and in the bearings f' .

Co-operative with the plungers and molds are the press-plates P , constructed of two similar plates parallel to each other and of sufficient thickness to render them firm. They are separated from each other by a space equal at least to the thickness of the mouth of the mold, and are so located that the plunger may pass between them to the mold. Their profile is similar to that of the table and the mouth of the mold. They are so formed that when the upper is in position upon the table they may be lowered down upon it with sufficient force to hold the whole upper taut while the plunger is giving it its profile by forcing it into and through the mold. These press-plates are suspended at the ends of the two tines of a fork, F'' , whose movements are guided and steadied by an arm, a' , which passes through a hub in the bracket b'' , attached to the front cross-bar of the frame F , and by its handle H , which passes through a bearing in the top of this same frame. The fork is lifted and lowered by the lever L' , which is supported by and operated upon a fulcrum in the jaws of a hanger, H' , attached to the rear of the upper part of the said frame F . The rear end of this lever is furnished with a grooved wheel, u , fitted to travel on the edge of a cam, Q , having as many operating surfaces as there are plungers, and which cam is secured to and revolved by the master-wheel.

The front end of the lever L' passes into a slot, o , in the handle of the press-plate fork. The relative positions of the slot and the fulcrum require an offset in the lever, as indicated in Figs. 2 and 3 and by the shadings in Figs. 1 and 1^a, in order to bring the two into alignment. A small spring, s'' , attached to the under side of the lever within the slot o , provides for any required springing upward of the press-plates, and so for a uniform action upon the upper when the leather varies in thickness. Another spring, e , coiled around the handle of the fork above the frame F , lifts the press-plates when the lever L' is relieved of this function.

The cam Q is so formed and adjusted by its attachment to the master-wheel that when the upper is in place upon the table, and its mold is in position to receive the plunger, the press-plates are at once lowered upon the upper and are immediately followed by the plunger.

The machine is set in motion by the foot or hand of the operator on moving the lever K to the right, whereby the belt-pulley L is thrown into gear by means of a clutch. The opposite movement of this lever will stop its motion. When the machine is set in motion, the upper to be crimped is placed upon the table at O , symmetrically over the mouth of the mold, with the heel portion pointing toward the shaft C . It is then carried around with the mold-block and brought into position to receive the plunger, when at once the press-plates descend, first, to hold the mold-block in position with their bar b' , and, next, to hold the leather taut for the plunger, which now follows the press-plates and forces the blank into and through the mold, thus crimping the upper; and now when the crimp is removed from the plunger and that portion above the dotted line i , Fig. 10, is cut away it is ready to be put upon the last. After the crimped upper leaves the mold it is carried upon the plunger to the rear of the machine, where, at a determined point, it is removed by the delivery-fingers d' , attached to the small shaft m , which is pivoted to the standard F' . These fingers are tilted backward by the action of the crank z of the mold-moving geared wheel Z against the bell-crank k , supported upon its standard a'' and connected by the rod e with the simple crank m' of the shaft m . When so tilted they pass between the leather and the plunger—one on each side of the plunger—and, removing the crimped upper, toss it into a box provided to receive it. This done, the fingers are at once tilted forward again by the spring e' , coiled around the small shaft m . The molds and the delivery-fingers are therefore operated by the geared wheel Z , the plungers and press-plates by the master-wheel M , and the master-wheel and mold-moving geared wheel by the pinion W and belt-pulley L .

The arrangement of the plungers and molds hereinbefore illustrated may be reversed, so that the plungers shall be attached to the block A and the molds to the drum B . The heel and toe of the plunger may also be reversed in position, and, finally, the plunger may be so constructed as to crimp leather or other impressible material into other forms and for other purposes besides foot-wear.

Having described the construction and operation of my machine, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for crimping uppers of foot-wear, a mold constructed with an entrance described on an arc of a circle substantially concentric with the path of travel of the plunger, and an outlet of substantially the shape of the profile of the bottom of the crimped upper for receiving the blank for the upper and open throughout its length next to the plunger, combined with the plunger adapted to be forced through the mold in an arc of a circle and carrying with it the blank to crimp it, substantially as described.

2. In a machine for crimping uppers of footwear, a rotary mold-block having a series of vertical wings containing the molds *a*, the removable plates *p*, arranged in said molds and adjustably secured in place, as by screws, and the springs interposed between the plates and the rigid wings, combined with a plunger and means to rotate it and carry it through the mold from end to end in an arc of a circle, substantially as described.

3. In a machine for crimping uppers of footwear, a mold having a channel the outlet through which is of substantially the shape of the profile of the bottom of the crimped upper, combined with a plunger forced through such mold in an arc of a circle and carrying with it and crimping the upper, substantially as described.

4. In a machine for crimping uppers of footwear, a mold having a table the surface of which is composed of a plane incline abruptly ending in an upturned curvilinear portion extending outward and above the plane to give initially to the blank of the upper the profile of the crimped upper, combined with the rotary plunger, whose leading end has substantially the same conformation, so as to strike the initially formed blank and force it at once throughout its length into the mold without injury to the leather, and, continuing to move in an arc of a circle, carry the said blank through and out of the mold, substantially as described.

5. In a machine for crimping uppers of footwear, a rotary plunger moving in an arc of a circle and having its leading end formed in substantially the shape desired for the profile of the top of the finished crimped upper, combined with a channel-mold the shape of whose mouth is the counterpart of the leading end of the plunger, having a table the surface of which is an inclined plane ending abruptly in an upturned receding portion elevated above the plane and also of substantially the conformation of the leading end of the plunger, and a press plate whose shape is the counterpart of the table, substantially as described.

6. In a machine for crimping uppers of footwear, a rotary master-wheel, a drum thereon, and a series of plungers projecting from the periphery of such drum, combined with a mold separated from the master-wheel and arranged in the arc of travel of the plungers, substantially as described.

7. In a machine for crimping uppers of footwear, a master-wheel provided with a series of plungers and a series of cams, combined with the mold, press-plates co-operating with the mold and plungers, and the lever connecting the press plates and cams, substantially as described.

8. In a machine for crimping uppers of footwear, the revolving mold-block, the channel-molds made lengthwise in said block, the corrugated plates arranged in the molds, and relieving springs for said plates, combined with a plunger, substantially as described.

9. In a machine for crimping uppers of footwear, the revolving mold block and its molds and the shaft for said block, combined with a plate on the mold-block shaft and spring-pawls in said plate, the reciprocating cross-head, and a ratchet-tooth and regulating-stop co-operating with said pawls, substantially as described.

10. In a machine for crimping uppers of footwear, the plungers and a rotary carrier therefor, combined with the molds and a carrier for them revolving at right angles with the axis of the carrier for the plungers, substantially as described.

11. In a machine for crimping uppers of footwear, the revolving mold-block and a plunger, combined with press-plates and the bar *b'*, attached to the press-plates, substantially as described.

12. In a machine for crimping uppers of footwear, the press-plates normally elevated by a spring, combined with a rotating cam, and a lever interposed between the cam and press-plates to bring and hold the press-plates in position for securing the work or blank of the upper, substantially as described.

13. In a machine for crimping uppers of footwear, the combination of the mold-block and shaft, pawl-plate and spring-pawls, reciprocating cross-head with ratchet tooth and regulating stop, crank-connecting rod, and mold-moving geared wheel with a suitable source of power, substantially as described.

14. In a machine for crimping uppers of footwear, the combination of the press-plates, shaft, coiled spring, lever and lever-spring, cam, and master-wheel, with operating mechanism, substantially as described.

15. In a machine for crimping uppers of footwear, the combination of the tilting delivery-fingers, their shaft, shaft-spring, crank-connecting rod, and bell-crank, with the crank of the mold-moving geared wheel and suitable driving mechanism, substantially as described.

16. In a machine for crimping uppers of footwear, the combination of the mold-block, plunger, drum, press-plates, and tilting delivery-fingers, with the driving mechanism, substantially as described.

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Witnesses:

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