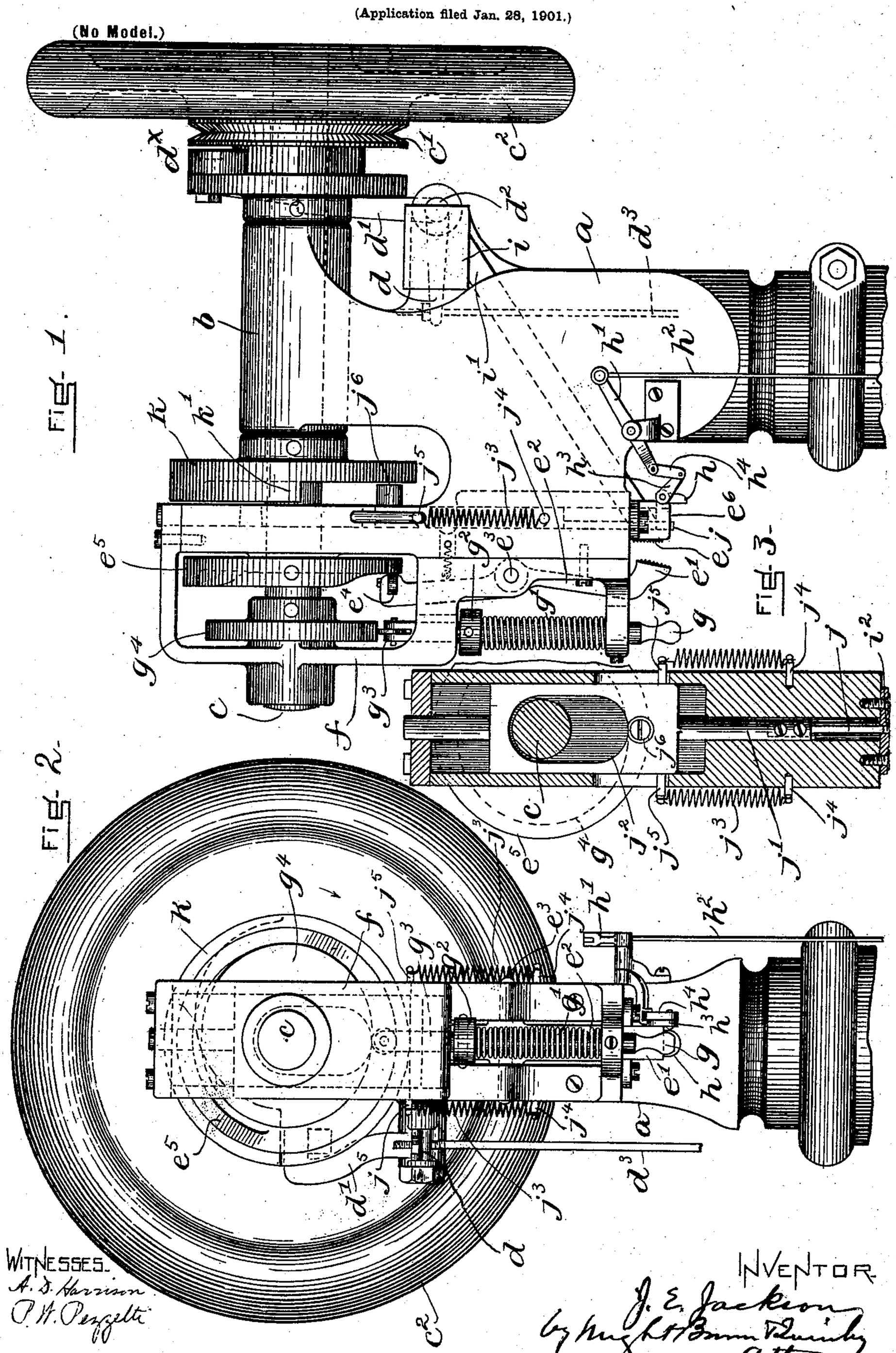
No. 700,332. Patented May 20, 1902.

J. E. JACKSON.

PULLING OVER MACHINE.

(Application filed Jan. 28, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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PULLING-OVER MACHINE.

SPECIFICATION forming part of Letters Patent No. 700,332, dated May 20, 1902.

Application filed January 28, 1901. Serial No. 44,973. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. JACKSON, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Pulling-Over Machines, of which the following is a specification.

This invention has relation to pulling-over machines or machines for stretching the upper of a boot or shoe preparatory to its being lasted or finally secured to the insole.

The object of the invention is to provide a machine which is automatic in its operation and yet which is under such manual control that the stretching of the upper may be governed by the operator.

Upper-leather varies greatly both as to thickness and elasticity, and a single upper, according to the portion of the skin from which it is cut, will frequently be much more elastic on one side than on the other. It frequently differs on its two sides in point of thickness or strength regardless of its resiliency or elasticity. Hence it is practically impossible, so far as I am aware, to provide a machine by which the upper is grasped on both sides and the two sides are pulled simultaneously to the same extent without the liability of one side being stretched more than the other, so that the upper will not occupy its proper position. In hand-lasting this difficulty is avoided, for the operator pulls over the upper to the extent that his experience has taught him is sufficient, care being taken by him to see that the upper is properly placed upon the last. In carrying out my invention I not only provide a machine by which the upper is grasped and is drawn in any desired direction with relation to the median line of the last, but I provide for the pulling being varied by the operator, according to the condition of the stock.

Referring to the accompanying drawings, which illustrate a machine embodying my invention, Figure 1 represents a side elevation of the machine. Fig. 2 represents an end elevation of the same. Fig. 3 represents a section from front to rear through the driver for securing the fasteners in the upper.

The machine is provided with a head a, having a bearing b for the shaft c. Loose on the end of the shaft is the pulley c' and the momentum-wheel c^2. Between the pulley and the shaft there is a suitable clutch device, which is indicated conventionally at $d^\times$, said device having the stop motion by which the shaft c is stopped at a certain point in its rotation. Such devices are well known, and it has not seemed necessary to illustrate one in detail.

The operation of the clutch and stop devices is governed by the levers $d\,d'$ on the rock-shaft d^2, the lever d being connected by a link d^3 with a treadle located in position to be depressed by the operator to release the stop devices and permit the clutching of the pulley c' to the shaft. When the treadle is raised, the lever d' is thrown into position to unclutch the pulley c' and to stop the shaft c at the proper point in its rotation.

The head is laterally extended and is provided with a gripper consisting of a fixed jaw e and a movable jaw e', either or both of which may be corrugated or toothed to secure it tightly upon the edge of the upper. The movable jaw is on the end of a lever e^2, fulcrumed upon a stud e^3 in a bracket f, attached to the side of the head. The upper end of the lever e^2 is equipped with a roller e^4, bearing against a cam e^5 on the shaft c. The only function that is performed by the gripper is to grip the edge of the upper, the said movable jaw e' being operated intermittently by the cam e^5, bearing against the roller e^4, said jaw being moved toward and from operative position once for each rotation of the shaft c. The lower face e^6 of the stationary jaw e is flat, as at e^6, and constitutes a stationary wiper and also a guide for the shoe, against which the latter may be pressed by the operator.

In order to cause the stretching or pulling of the upper over the last after its edge has been grasped between the jaws $e\,e'$, I provide a reciprocating abutment g. This abutment is mounted in guides in the bracket f, and it is held normally raised by a spring g', pressing against the collar g^2. Upon the upper end of the movable fulcrum or abutment g

there is a roller g^3, which bears against the periphery of a cam g^4 on the shaft c. The cams e^5 and g^4 are so formed and arranged relatively to each other that the jaws are operated to grip the upper immediately prior to the depression of the abutment g, the effect of this being to cause the gripping of the upper and the depression of the last, whereby the upper is drawn along a line from the vertical plane of the end of the abutment to the ends of the jaws $e\ e'$. The last during the operation of the machine is held in the hands of the operator, with the insole uppermost and bearing against the abutment g. The edge of the upper is placed between the jaws $e\ e'$, and when the latter has gripped it and the abutment g is depressed the last and the upper thereon are moved downwardly about the hands of the operator, the latter serving as a fulcrum. In other words, the operator holds the last firmly, and the abutment forces it downwardly, with the result that the upper is stretched over the last. The operator may vary the tension of the stretched upper by swinging the last about the abutment to move the inner part thereof toward or from the wiper e^6. At the same time he moves the last so as to draw the upper over the bottom of the last, sliding the last relatively to the stationary wiper e^6. A guide h is pivoted to the stationary jaw to limit the sliding movement of the last. The guide, however, can be swung out of the way above the plane of the wiper-face e^6 in pulling over and fastening the upper at the shank by means of a tip-lever h', operated by a treadle (not shown) connected thereto by a link h^2. The tip-lever is connected to the guide h by links $h^3\ h^4$. After the upper has been wiped over the bottom of the last a fastener is driven into it to secure it in place. The fasteners are fed from a reservoir (indicated more or less conventionally at i) through a chute i', and they are delivered to the throatway formed in the stationary jaw e. A driver j, which is adapted to operate through the said throat, is secured to a driver-bar j', adapted to reciprocate in guides in the head. The upper end of the driver-bar is slotted, as at j^2, to receive the shaft c, said driver being raised by a cam and drawn downward to operative position by springs $j^3\ j^3$, as shown in Fig. 3, said springs being attached to studs j^4 on the head and studs j^5 on the driver-bar. The cam for operating the last-mentioned element is indicated at k, and it is formed with a wedge-shaped cam k', which intermittently engages a roll j^6 on the driver-bar. The cam raises the bar to its highest limit of movement and then permits it to be drawn quickly by the springs j^3 to cause the drivers j to engage a fastener at the lower end of the chute, drive it through the throat i^2, and force it into the work. The cam k' is timed so that the driver-bar descends immediately prior to the release of the upper from the jaws $e\ e'$.

With this construction and arrangement it will be observed that the upper can be pulled over the last according to the judgment of the operator just as in the pulling over of uppers by hand. If the upper is particularly weak at any point, the operator can vary the downward thrust of the last by swinging the outer part of the last downward as the movable abutments descend to prevent it from being stretched too much, or he may increase the tension of the upper by swinging the last about the movable abutment, as will be readily understood.

With this machine I first pull over the upper at the toe and then along the sides at as many points as may be desirable. It is not essential that the movable parts should be arranged to operate downwardly, for the head and the parts carried thereby can be turned upside down and operated so that the operator can see the top of the last rather than the bottom.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. A pulling-over machine having a gripper one jaw of which is fixed, and an automatically-operated member for forcing the last away from the gripper to stretch the upper, said automatically-operated member being located at a distance from the gripper to permit the last to be rocked on said member by the operator to manually control the amount of stretch.

2. A pulling-over machine having a gripper one jaw of which is fixed, an automatically-operated member for forcing the last away from the gripper to stretch the upper, and means for automatically operating the movable jaw of the gripper, the said automatically-operated member being located at a distance from the gripper to permit the last to be rocked on said member by the operator to manually control the amount of stretch.

3. A pulling-over machine having a gripper for the edge of the upper, one jaw of the gripper being fixed, an abutment against which the bottom of the last is held by the operator, and means for reciprocating the abutment, the said abutment being located at a distance from the gripper to permit the last to be rocked thereon by the operator to manually control the amount of stretch.

4. A pulling-over machine having a gripper for the edge of the upper, an abutment against which the bottom of the last is held by the operator, and relatively to which the last may be moved to lay the edge of the upper over the insole, and means for moving the abutment to force the last away from the gripper, the said abutment being located at a distance from the gripper to permit the last to be rocked by the operator to manually control the amount of stretch.

5. A pulling-over machine comprising an

automatic gripper one jaw of which is fixed, automatic means coöperating with said gripper to stretch the upper, relatively to which means the last is movable in a direction lateral to the direction of pull, and automatic mechanism for fastening the upper to the insole.

6. A pulling-over machine comprising a stationary wiper, a gripper, a device coöperating with the gripper to stretch the upper and movable in a direction to stretch said upper while held by the gripper, and cams for automatically operating said gripper and said stretching device.

7. A pulling-over machine comprising upper-stretching mechanism and a stationary wiper, mechanism for fastening the upper to the insole, and a gage pivoted to said wiper and bodily movable into inoperative position above the plane of said wiper to permit the fastening mechanism to operate on the shank of the partially-formed shoe.

In testimony whereof I have affixed my signature in presence of two witnesses.

JAMES E. JACKSON.

Witnesses:
M. B. MAY,
A. D. HARRISON.