F. F. DORSEY.

STITCH IMPRESSION MACHINE.

APPLICATION FILED APR. 24, 1909.

1,047,924. Patented Dec. 24, 1912.

Fig. 1

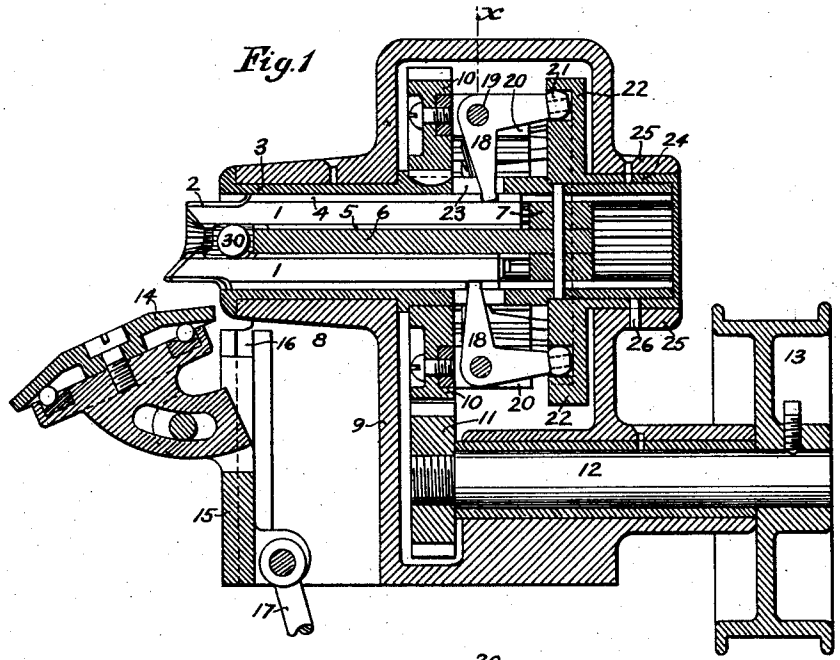
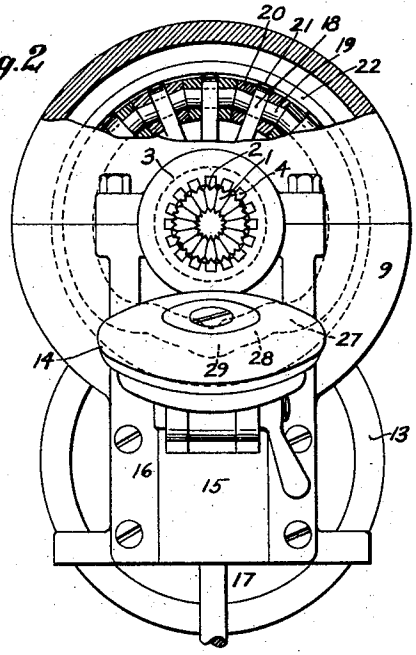


Fig. 2



WITNESSES:

Grace Carss.

Minnie M. Kaufmann

INVENTOR.

Farnum F. Dorsey

UNITED STATES PATENT OFFICE.

FARNUM F. DORSEY, OF NEW YORK, N. Y., ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

STITCH-IMPRESSION MACHINE.

1,047,924. Specification of Letters Patent. Patented Dec. 24, 1912.

Application filed April 24, 1909. Serial No. 492,058.

To all whom it may concern:

Be it known that I, FARNUM F. DORSEY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Stitch-Impression Machines, of which the following is a specification.

This invention relates to machines for producing ornamental indentations or impressions upon the welt, or upon the upper surface of the sole-margin, of a shoe, to produce an ornamental effect, or to simulate the appearance of a seam.

The object of the invention is to produce a machine which will operate rapidly, and which will produce regular and sharply-defined impressions regardless of the shape of the shoe.

A second object of the invention is to produce a machine which is adapted for use either to produce indentations, or to burnish and finish indentations already formed, or to perform both functions at a single operation.

An important novel feature of construction by which the above-mentioned objects are secured consists in the use of a tool which has the general character of a roll and which operates rotatively, but which comprises a plurality of members which are relatively-movable in the direction of the axis of the tool or of the length of the impression-forming teeth of the tool, both for the purpose of accommodating the tool to the form of the shoe, and for the purpose of securing the burnishing effect.

In stitch-impression machines, as previously constructed, where a tool in the form of a roller is used, it has been necessary and customary to form the roller as a truncated cone with its larger end outward, in order to produce an acute angle at the portion of the roller which enters the crease between the upper of the shoe and the welt or the sole-margin. In a roller of this form the indenting teeth are necessarily convergent toward the inner and smaller end of the roller, but this arrangement is obviously incorrect, so far as the proper relation of the form of the teeth to the form of the work is concerned, since the outline of the shoe at the fore-part is so curved that the impressions must converge toward the center of curvature, within the margin of the sole, that is, from the edge inward, which is opposite to the direction of convergence of the teeth of the tool. This incorrect relation renders it difficult to produce regular and clearly-defined impressions, particularly about the toe of the shoe, where the curvature is sharpest, and it also makes it impracticable to feed the work by the action of the tool. Owing to the defects above pointed out in machines of the type referred to, it has been proposed to use machines operating intermittently and without the use of rollers, but such machines are comparatively slow in operation and do not feed the work uniformly and smoothly.

In my present invention I secure the smooth and rapid operation of a roller machine, while avoiding the imperfect work due to the use of the usual conical roller. This result I accomplish by the use of a plurality of members, each of which is provided with one or more impression-forming teeth. These members are circularly disposed so as to constitute a compound tool having the general form of a roller, and they have a general movement of rotation so as to feed the work and to be brought successively into engagement with the work. In addition to their rotation, the tool members are moved independently in the general direction of the axis of the tool, or substantially parallel with the surface of the work and longitudinally with respect to the length of the teeth. The primary purpose of this movement is to thrust the tool members forward as they engage the work, to cause them to enter fully between the shoe-upper and the welt or the sole-margin, and then to retract them so as to clear the overhanging upper as they are raised from the work in their continued rotation. The secondary purpose of the axial movement of the tool members is to cause them to move longitudinally while engaging the work, so as to burnish the stitch impressions.

Other objects and features of my invention will be noted in connection with the following description of the illustrated embodiment of the invention.

In the accompanying drawings Figure 1 is a vertical longitudinal section of a machine embodying the present invention, and Fig. 2 is a front elevation of the machine

illustrated in Fig. 1, with the upper part of the machine broken away on the line x in Fig. 1.

In the illustrated embodiment of the invention the several members, 16 in number, of which the tool is composed, consist of bars 1 which are tapered in cross-section toward their inner edges, so that they lie close together in a body having the general form of a hollow cylinder. Each tool member 1 has two teeth 2 formed in its outer edge near the forward end, and the toothed extremities of the members constitute, together, a continuous toothed surface substantially like that of a cylindrical toothed roller. The forward extremities of the tool members are also beveled, as shown in Fig. 1, so that they may enter the crease between the shoe-upper and the welt or sole-margin.

The tool members 1 are mounted in a tool-carrier which comprises a stem 6 and cylindrical sleeve 3 surrounding the stem. The sleeve 3 is journaled in a bearing 8 in the frame or casing 9 of the machine. The outer edges of the toothed members are formed with longitudinal ribs 4, which engage corresponding grooves in the sleeve 3, and thus the tool members are free to slide longitudinally in the annular space between the stem 6 and sleeve 3, but are restrained from rotation therein.

In order to guide and support the inner edges of the tool members, these edges are beveled, as at 5 in Fig. 1, and they engage corresponding angular grooves in the central stem 6 which is connected rigidly at its rear end to the sleeve 3, as shown in Fig. 1, so as to rotate in unison with the sleeve. For this purpose the stem is fixed in a block 7 fitting the sleeve and the stem, the block and the sleeve are all secured together by a transverse pin.

In the machine illustrated I feed the work by positively rotating the tool. For this purpose a gear 10 is fixed on the tool carrier, and this gear meshes with a pinion 11 which is fixed on a drive-shaft 12. The drive-shaft is provided with a pulley 13, which may be connected with any suitable source of power to actuate the machine.

The work is supported, during the operation of the tool, by a rotatable work support 14, of well-known form, which is carried by a vertical slide 15. The slide moves in guides 16 in the frame of the machine, and it is connected, by a rod 17, with a treadle (not shown) of any ordinary or suitable form, by which the work support may be raised to bring the work into engagement with the tool.

The longitudinal or axial movements of the tool members are produced through the action of bell-crank levers 18. These levers are pivoted on pins 19 fixed in forked arms 20, and the arms are mounted upon the back of the gear 10, so that as the gear rotates the levers are carried around with it. Each lever 18 carries a cam-roll 21, and the cam-rolls travel in a cam-path formed in the forward face of a plate-cam 22. This cam is fixed in the casing or frame of the machine, being provided with a hub 24 seated in a boss in the frame and secured against rotation by a pin 26. The hub 24 is bored to form a bearing for the rear end of the sleeve 3 of the tool-carrier, which rotates freely therein.

Each lever 18 has an arm extending into the tool-carrier through a slot 23 in the sleeve 3 and engaging a notch in one of the tool-members, as shown in Fig. 1, so that each tool-member is independently actuated by one of the cam-levers, and as the levers follow each other in the cam-path they are actuated in succession to move the tool members forward and back.

The form of the cam-path is indicated in dotted lines in Fig. 2, and it will be seen that in its upper portion it is concentric with the axis of the tool-carrier and at its maximum distance from the center, so that the tool members, when at a distance from the surface of the work, remain in retracted position so as to clear the overhanging upper of the shoe. As the tool-members and the corresponding cam-rolls approach the lowermost point in their path of motion, however, the cam-rolls engage a portion 27 of the cam-path where it curves inwardly, and this results in a motion of the cam-levers by which the tool-members are thrust into their forward position. This action is timed to occur as the tool-members pass below the projecting shoe-upper, and it is preferably completed before the tool-members engage the work, so as to avoid movement of the tool-members when under pressure in an inclined position, and to reduce wear on the cam-rolls and the cam.

As the tool-members retreat from the work they are retracted in a similar manner, the cam being formed symmetrically in this respect, so that the machine may be rotated and caused to feed the work in either direction, according to the convenience of the operator.

The machine, in so far as above described, is adapted to form stitch-impressions or indentations in the first instance, and it operates uniformly and continuously, and may be driven as fast as the operator can guide the work. The pressure of the tool against the work is controlled by the operator, by the operation of the treadle on the work-support, and as the tool tends normally to form parallel impressions, the work may be done on both reëntrant and salient curves with a minimum of inaccuracy and without the uncertainty of a conical roll such as is ordinarily used.

To adapt the machine to burnish stitch-impressions, the cam 22 is formed to impart an additional motion to the tool-members. As shown in Fig. 2, a short depression 29 is formed at the lowermost point in the cam path, and this results in a short retracting and advancing movement in each tool-member while it is in full engagement with the work. This movement causes the tool-member to slide in the stitch impression and thereby to smooth or burnish the surface of the impression and of the material between the impressions.

The machine may be used to form and burnish the impressions at one operation, or it may be used to burnish impressions previously formed either by the same machine or by a machine of a different kind, and thus a single machine is sufficient to perform the operations for which two machines are usually required.

In order to support the tool-members without undue friction during their burnishing movements, which occur while the tool-members are under pressure from the work, a ball 30 is located between the forward portions of the tool-members, engaging flattened portions of their inner edges. This ball has a rolling engagement with each tool-member as it is retracted and advanced by the action of the portion 29 of the cam, the tool members being fitted sufficiently loosely in the tool-carrier to permit the pressure to be borne by the ball and not by the edges of the tool members in engagement with the stem 6.

Although I consider it preferable, and sufficient, to feed the work by the rotation of the tool, it will be apparent that the work-support may be constructed, in any well-known manner, to perform or to share in this function. Various other modifications may be made in the illustrated embodiment of the invention without departure from the nature of the invention and the scope of the following claims.

I claim:—

1. A stitch-impression machine having, in combination, a plurality of tool members arranged to engage the work successively and to operate continuously thereon, and means for advancing the tool members as they approach the surface of the work, for imparting to the tool members a backward and forward burnishing movement while they are in engagement with the work and for retracting the tool members as they recede from the surface of the work.

2. A stitch-impression machine having, in combination, a rotatively-mounted tool comprising a plurality of work engaging members arranged in a circle, means for imparting to the work engaging members advancing and retracting movements substantially in the direction of the axis of the tool as the work engaging members approach and recede from the surface of the work, and means for imparting to each work engaging member a short retracting and advancing movement while it is in contact with the work to burnish the impression.

3. A stitch-impression machine having, in combination, a rotary carrier having axially extending guideways, a plurality of tool members longitudinally movable in said guideways, levers mounted on the carrier and engaging said tool members, and a cam for oscillating the levers to move the tool members in the carrier.

4. A stitch-impression machine having, in combination, a rotary carrier having axially extending guideways, a plurality of tool members longitudinally movable in said guideways, bell crank levers mounted on the carrier and articulated with the tool members, means for rotating the carrier, and a stationary barrel cam engaged by the free ends of the bell crank levers and acting to oscillate them to move the tool members relatively to the carrier.

5. A stitch-impression machine having, in combination, a rotary tool carrier comprising a cylindrical sleeve, a plurality of tool members inclosed by and slidingly mounted in the sleeve, means for rotating the carrier, and means for independently moving the tool members longitudinally of the sleeve.

6. A stitch-impression machine having, in combination, a rotary tool carrier comprising a stem and a cylindrical sleeve surrounding the stem, a plurality of tool members held to move longitudinally in the annular space between the stem and sleeve, means for rotating the tool carrier, and means for reciprocating the tool members in the carrier.

7. A stitch-impression machine having, in combination, a rotary tool carrier comprising a stem formed with longitudinal grooves and a cylindrical sleeve surrounding the stem and formed with grooves on its inner surface opposite the grooves on the stem, tool members mounted in the carrier with their edges slidingly received in said grooves, means for rotating the carrier, and means for reciprocating the tool members in the carrier.

8. A stitch-impression machine having, in combination, a rotary tool carrier comprising a stem and a cylindrical sleeve surrounding the stem, a plurality of tool bars held to slide longitudinally in the annular space between the stem and sleeve, levers mounted on the carrier and extending within the periphery of the sleeve to engage the tool bars, means for rotating the tool carrier, and means for oscillating the levers to reciprocate the tool bars in the carrier.

9. A stitch-impression machine having, in combination, a rotary tool carrier, a plu-

rality of tool bars grouped in a general-cylindrical arrangement in the carrier, a ball surrounded by the bars and acting as an anti-friction bearing between their inner edges, means for rotating the carrier and bars, and means for reciprocating the bars in the carrier.

10. A stitch-impression machine having, in combination, a rotary carrier comprising a stem formed with longitudinal grooves, a plurality of tool bars slidingly held in said grooves and projecting forwardly beyond the end of the stem, a ball of approximately the same diameter as the stem held between the projecting ends of the bars and acting as an anti-friction bearing between their inner edges, means for rotating the carrier, and means for reciprocating the bars in the carrier.

In testimony whereof, I affix my signature in presence of two witnesses.

FARNUM F. DORSEY.

Witnesses:
GRACE CARSS,
MINNIE M. DENNEBAUM.