

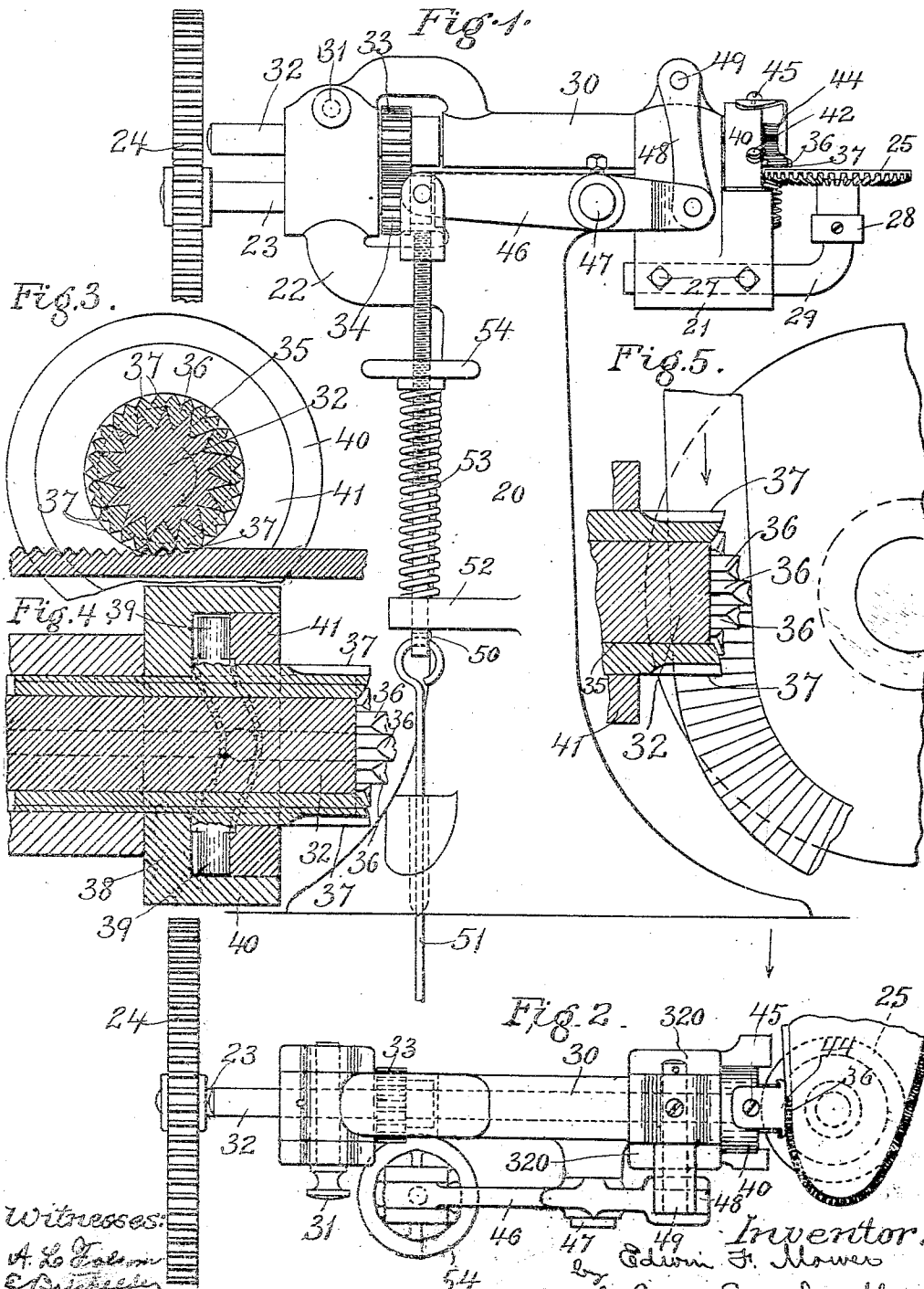
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E. F. MOWER.
STITCH INDENTING MACHINE.
APPLICATION FILED AUG. 26, 1908.

1,054,021.

Patented Feb. 25, 1913.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

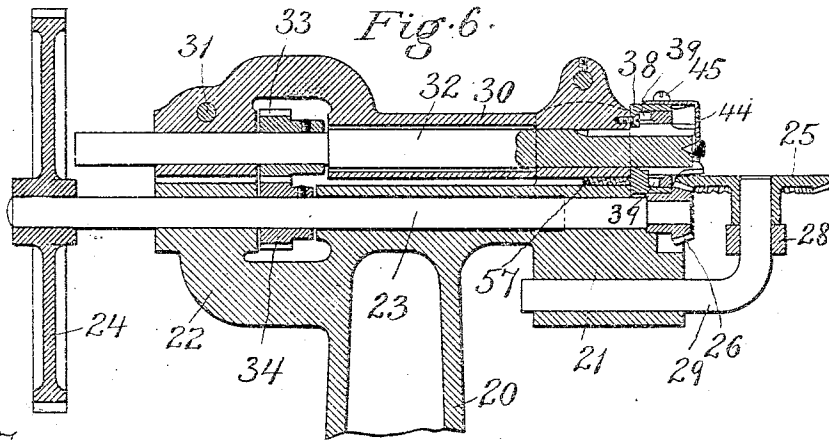


Fig. 7.

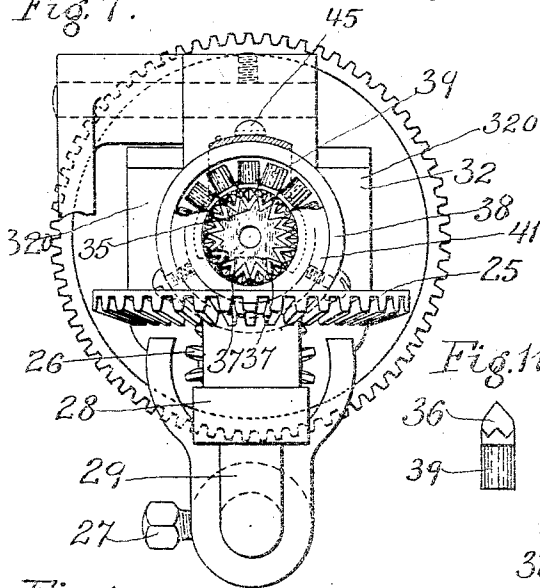


Fig. 9.

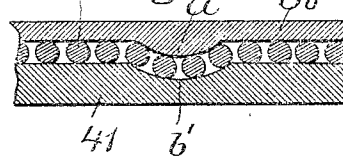


Fig. 11.

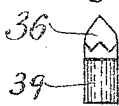


Fig. 10.

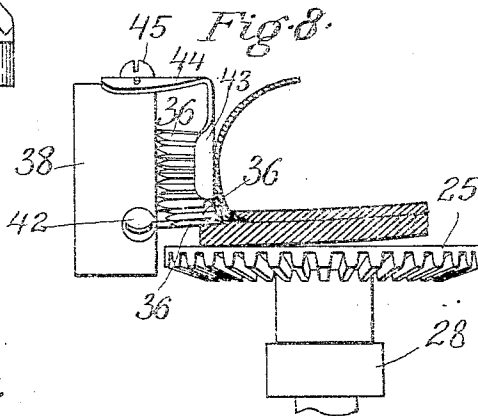
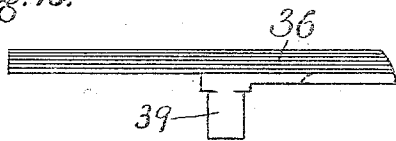
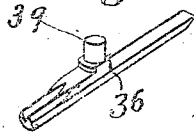


Fig. 12.



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 atty

UNITED STATES PATENT OFFICE.

EDWIN F. MOWER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

STITCH-INDENTING MACHINE.

1,054,021.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed August 26, 1908. Serial No. 450,387.

To all whom it may concern:

Be it known that I, EDWIN F. MOWER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Stitch-Indenting Machines, of which the following is a specification.

This invention relates to machines intended primarily for indenting the upper side of that portion of the welt or sole of a boot or shoe which projects beyond the upper and extends around the forepart and for thus forming what are sometimes referred to as impression stitches. In the usual McKay shoe such indentations are formed in the outer or tap sole while in a Goodyear or McKay welt shoe they are formed in the welt. However, the welt may be considered as a part of the outer sole of a Goodyear or McKay welt shoe for the purpose of the present application, and therefore, to avoid unnecessary repetition, where the operation of indenting a sole is hereinafter referred to, it is to be understood as including also the indenting of a welt. Inasmuch as the operation of indenting is commonly performed after the shoe is lasted and usually near the end of the series of operations involved in the manufacture of the shoe, it is particularly necessary to avoid injuring the upper by allowing the indenting blade or member to contact therewith. There is considerable danger of so injuring the upper where it projects to a considerable extent over the portion of the sole to be indented. It is desirable, however, to have the indentations extend as nearly as possible to the upper. In the use of the machines of the class described, as now commonly adjusted and operated, the indentations terminate a considerable distance from the upper. Various constructions have been proposed by which the indenting member may act upon the sole close to the upper, such constructions involving an inward movement of the member toward the upper as it approaches the sole to form an indentation. So far as applicant is aware, however, the indenting member, according to these proposed constructions has always been arranged to reciprocate in a vertical plane substantially perpendicular to the sole and to its edge.

One feature of the present invention is the

provision of one or more indenting members or blades mounted to travel approximately in a rotary path in their movement toward and from the sole for indenting it and also mounted to move in and out transversely of the sole so that the indentations may extend, if desired, close to the upper.

Another feature of the invention is the provision in a machine in which the indenting member is movable in and out in this manner of a guard adjacent the acting end of the indenting tool to protect the upper.

In the preferred embodiment of the invention, the indenting member is carried toward and from the sole by the rotation of a carrier or holder in which said member is mounted and as the member approaches the sole it is moved in its carrier substantially parallel both to the axis of rotation and to the surface of the sole to carry the end of the member under the overhanging upper.

A further feature of the invention is the provision of guiding means, as, for example, a stationary member having a cam groove directly engaging the indenting member, to move the same forward as it approaches the sole. Thus the machine may be employed for indenting fine shoes such as those made of delicate materials or patent leather.

While it is contemplated that a single indenting member may be employed, it is deemed preferable to provide a plurality of such members arranged in a rotary carrier or holder approximately in a circle. With such a construction the proportions of the parts may be such that several of the indenting members shall be in engagement with the sole at the same time and moreover the sole will be engaged continuously during the indenting operation by the indenting members, which become active successively.

Another feature of the invention is to so construct the machine that the pressure upon the projecting edge of the sole may be in lines perpendicular thereto. That is, I secure such a relation between the indenting mechanism and the shoe support that the pressure upon the projecting edge of the sole will be direct, or perpendicular to the edge of the sole and the face of the support, instead of at an inclination thereto.

The invention may be embodied in a variety of instrumentalities, though I have

illustrated upon the drawings the best form of machine which I have devised for accomplishing these purposes. In this preferred embodiment of the invention I provide a
 5 suitable support or rest, upon which the sole of the shoe may be placed and supported from its edge substantially to its median line. In operative relation to this support, I arrange a fudge wheel or indenting wheel,
 10 the axis of which is substantially parallel with the plane of the operative portion of the support, so that the pressure exerted by the wheel is perpendicular to the operative face of the support. Instead of making the
 15 wheel frusto-conical with the base outward, as heretofore, I employ an indenting wheel or tool the peripheral surface of which is substantially cylindrical (or slightly tapering or converging outwardly), so that the
 20 line of pressure is perpendicular to the teeth or ribs of the wheel. Consequently, when the edge of the shoe is introduced between the wheel and the support, the pressure is directly downward against the shoe so that
 25 there is no tendency whatever to move one layer of the projecting portion of the shoe relatively to another layer, as there is when the wheel has considerable taper.

Referring to the accompanying drawings,—Figure 1 represents a side elevation of an indenting machine embodying the invention. Fig. 2 represents a plan view of the same. Fig. 3 represents an enlarged vertical transverse section through the indenting tool. Fig. 4 represents an enlarged horizontal section through the same. Fig. 5 illustrates the action of the toothed or ribbed members upon the work. Fig. 6 represents a longitudinal vertical section through the entire machine. Fig. 7 represents a front elevation of the machine somewhat enlarged with the guard removed and a portion of the head broken out to show the studs on the toothed or ribbed members or blades. Fig. 8 illustrates how the toothed members are projected beyond the guard. Fig. 9 illustrates a partial development of the stationary cam which effects the longitudinal movement of the said toothed members. Figs. 10, 11 and 12 are views of one of the toothed members.

Referring to the accompanying drawings, 20 represents a column or standard having forwardly and rearwardly extending brackets 21, 22 in which is journaled a main driving shaft 23 which may be rotated by any suitable means such as a gear 24. Arranged at the front of the machine is the shoe or work support indicated at 25. It is illustrated as consisting of a geared wheel having a flat horizontal upper surface and being journaled upon the upstanding end of a bent rod 29, adjustably secured in the bracket 21 by set screws 27. The shoe support 25 is loose upon the upright end of the

rod and its hub rests upon a collar 28 secured to said rod. The said support is provided with beveled gear teeth which intermesh with a driving beveled gear 26 on the end of the shaft 23.

30 indicates a movable head which is mounted upon the pivot 21 passed laterally through ears or lugs projecting upwardly from the bracket 22. The front portion of the head is adapted to swing upwardly or downwardly between guides 320 extending upwardly from the bracket 21. Journaled in the front and rear ends of the head, is a shaft 32 having a gear 33 intermeshing with, and driven by, a gear 34 on the shaft 23. This shaft 32 serves to actuate the indenting tool or wheel, the front end of the shaft forming, as it were, a portion of the tool, and constituting a holder for the indenting members. It is provided in its periphery with a plurality of V-shaped grooves or guideways 35 in which are placed toothed or ribbed indenting members, bars or blades 36. Each blade or tool member is illustrated as being provided with two ribs or teeth 37, but it will be understood that a greater or less number of teeth may be formed on each member as desired. These teeth are formed on the ends of said members as shown in Fig. 12. The rear portion of each member is held in place by a collar 38 which is attached to the front of the head. The front face of the collar is formed as a cam against which rest radially-projecting studs or fingers 39 on the members 36. The collar 38 is provided with a rim 40 within which is inserted a collar 41 held therein and secured against rotation by screws 42. The inner face of the collar 41 is complementary to the opposing face of the collar 38, these faces being separated to form a stationary cam groove for the studs 39. The collar 41 also serves the purpose of assisting in holding the members 36 in their grooves or guideways, said collars 38 and 41 constituting bearings for the indenting tool. The toothed or ribbed portions of the members extend outward beyond the collar 41, so as to project over the surface of the shoe support, as shown in Figs. 4 and 5. The opposing faces of the collars or cam members 38 and 41 are so formed with the projecting portion *a* on the cam 38 and a recess *b'* in the face of the cam 41, that, when the shaft 32 is rotated, each blade will be held in a retracted position until it approaches the shoe support 25, at which time it will be advanced under the overhanging upper, as shown in Figs. 5 and 8, into position for indenting the work. When the blade reaches an imaginary line perpendicular to the surface of the work support and cutting the axis of the shaft 32, the blade will have been projected to its greatest extent, as shown in Fig. 5, and will have been pressed into the work to

form an indentation. As the shaft continues to rotate, the blade will be retracted, the retracting movement taking place as or after the ribs or teeth thereon leave the work. In view of this description, it will be seen that the toothed members are rotated about a common center, but are independently movable longitudinally into active engagement with the work which is placed upon the work support 25. The work support and the indenting tool are both rotated by power at substantially the same peripheral speed and thus feed the work.

The forward ends of those members which are out of engagement with the work, are covered by a guard or gage indicated as a whole at 43. It consists of a plate whose side edges are curved so as to overlap the periphery of the tool, Figs. 1 and 8, and which is formed with a bent shank 44 which is secured to the rim 40 of the collar 38 by a screw 45. The upper of the shoe may rest against the said guard, as shown in Fig. 8, and as the blades or members are rotated, they project under the guard across the projecting sole or welt so as to form indentations therein, the ends of the said members extending into the welt crease and coming into close proximity to the point at which the upper is attached to the shoe. As a convenient means for lifting the head and raising the indenting tool away from the work support, I provide a two-armed lever 46 fulcrumed upon a stud 47 and connected at one end by a link 48 with a pin 49 projecting laterally from the front end of the head 30. The other end of the lever 46 is adjustably connected to a rod 50, the lower end of which is connected by a link 51, or other form of suitable connection, with a foot treadle not shown. The said rod 50 passes through a guide formed by a bracket 52 on the column, and against said bracket rests a spring 53, the upper end of which bears against the hand wheel 54 or nut placed on a threaded portion of the rod and adjustable thereon to vary the tension of the spring. The spring forces the rod yieldingly upward so as to hold the head and the indenting tool downward yieldingly toward the work support with a pressure sufficient to produce indentations of the desired depth in the projecting sole edge.

On the bracket 21 is placed a stop 57 which may consist of a piece of leather or other suitable material which limits the movement of the indenting tool toward the work support. By depressing the rod 50, the head may be raised against the tension of the spring.

The indenting tool may be substantially cylindrical but I prefer to make its operative end slightly converging outwardly, as illustrated in Fig. 8, since such a construc-

tion tends to secure a regular and accurate indenting of the projecting edge of the sole at the toe inasmuch as the surface speed of each active portion of the tool will correspond approximately with that of the engaged portion of the work.

The operation of the machine will be well understood from the description hereinbefore given. As the indenting tool and work support rotate, they feed the work along, the blades of the indenting tool being successively advanced as they approach the work, so as to extend entirely across the projecting edge of the shoe, and then retracted into inactive position where they will not interfere with the overhanging upper. The movement of each blade in the direction of its length while in engagement with the work tends to burnish the surfaces of the indentations being formed.

Having thus explained the nature of my said 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. In an indenting machine, an indenting member shaped to enter the crease between the projecting margin of the sole of a shoe and the overhanging upper, said member being constructed and arranged for movement both in a curved path toward and from said margin for forming indentations therein and also for movement transversely of the sole, in combination with means for projecting said member outwardly into the crease as said member approaches the sole, for retracting it as it leaves the sole and for then maintaining it retracted until it is again about to come into engagement with the sole.

2. In an indenting machine, a work support and an indenting member constructed and arranged to move toward and from the active surface of the work support and to move also in a direction substantially parallel to said surface and transversely of the work, in combination with means for projecting said member outwardly as it approaches the work support, for retracting said member as it recedes from the work support and for then maintaining it retracted while it is relatively far from the work support.

3. In an indenting machine, a flat work support having a horizontal surface, an indenting member rotatable about a horizontal axis and overlapping said surface, and power actuated means for moving said member both about said axis to indent and feed the work and also substantially parallel to said surface to burnish the indentations.

4. In an indenting machine, a rotary holder, a member movable therewith to indent the projecting margin of the sole of a shoe and guiding means directly engaging

the member to move it in and out relatively to the holder, parallel to the sole and transversely of the sole edge.

5 In an indenting machine, a member movable to indent the projecting margin of the sole of a shoe and a relatively stationary guiding cam engaging said member to cause it to move outwardly as it approaches the sole.

10 6. An indenting tool comprising a plurality of substantially parallel blades or members movable about a common axis, and independently movable longitudinally of said axis.

15 7. An indenting tool, comprising a plurality of parallel blades or members having ribs or teeth, said blades or members being horizontally movable relatively to each other.

20 8. An indenting tool, comprising a holder having axially-extending guideways, and a plurality of indenting members longitudinally movable in said guideways.

25 9. In an indenting machine, a plurality of substantially parallel indenting members constituting an indenting tool, means for rotating said members about a common axis, and means for reciprocating said members longitudinally of said axis.

30 10. An indenting tool, comprising a series of indenting members grouped together to form a ribbed wheel and movable in the direction of their length relatively to each other.

35 11. In an indenting machine, a series of indenting members grouped together to form a ribbed wheel, means for rotating said wheel, and means for advancing and retracting said members successively in the direction of their length.

40 12. In an indenting machine, a work support, a rotary holder having a guideway and arranged in operative relation to said work support, an indenting member longitudinally movable in said guideway, means for rotating said holder to cause said member to move in a circle tangential to a plane parallel with said work support, and means for projecting said member as it approaches said work support and for retracting said member as it leaves said work support.

45 13. In an indenting machine, a work support, a rotary holder, a series of indenting members on said holder, means for rotating said holder, and a cam mechanism for reciprocating said members longitudinally of the axis of rotation of said holder.

50 14. In an indenting machine, a shoe support, a rotary indenting tool comprising a series of members arranged approximately in a circle, the tool tapering toward its outer end and being smallest at such end, and means for moving said members outwardly in the general direction of the axis of the circle as they approach the sole of the shoe.

15. In an indenting machine, a plurality of indenting members movable toward and from the projecting margin of the sole of a shoe for forming indentations therein and also movable independently in and out transversely of the sole, in combination with a guard adjacent the acting ends of said members to protect the upper.

16. In an indenting machine, a work guard or gage, a work support thereunder, a series of indenting members back of said gage, means for rotating said members about a common axis, and means for projecting said members successively under and past said guard or gage to operate on the work.

17. In an indenting machine, a rotatable work support, a rotatable indenting wheel, means for rotating said work support and wheel to feed the work, said wheel comprising a plurality of longitudinally movable indenting members, and means for reciprocating said members longitudinally.

18. In an indenting machine, a rotatable work support, a rotatable indenting wheel, means for rotating said work support and wheel to feed the work, a work gage or guard at the front end of said wheel, said wheel comprising a plurality of independent indenting members, and means for successively projecting the ends of said members in the general direction of the axis of the wheel beyond said gage or guard and retracting them.

19. In an indenting machine, a work support for receiving the sole of a shoe to be indented, a series of indenting members, means for moving said members independently and successively in the direction of their length to cause their ends to enter the welt crease of the shoe, and means for moving said members in a different direction to feed the shoe.

20. In an indenting machine, a circular series of indenting members provided with ribs or teeth, a rotary holder therefor, radial projections on said members and two separated collars encircling said members arranged side by side and forming a cam groove, in consequence of which the rotation of said holder effects a circular and reciprocatory movement of said members.

21. In an indenting machine, a circular series of parallel indenting members, having at their ends radial ribs or teeth, a rotary holder for said members, and means for successively projecting the toothed ends of said members in the general direction of the axis of the holder beyond the end of said holder.

22. In an indenting machine, a work support, a circular series of substantially parallel independently movable indenting members, and mechanism by which each member is projected across the work into position for indenting, is then pressed

against the work to form an indentation, and is withdrawn substantially as set forth.

23. 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 imparting independent movement to said members in a direction substantially parallel with the surface of the work.

24. 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 successively into, and retracting them from, the crease between the shoe-upper and the welt or sole-margin.

25. A stitch-impression machine having, in combination, a rotatively-mounted tool comprising a plurality of work-engaging members arranged in a circle, and means for imparting independent movements to said members, as the tool rotates, substantially in the direction of the axis of rotation of the tool.

26. A stitch-impression machine having, in combination, a rotatively-mounted tool comprising a plurality of work-engaging members arranged in a circle, and means for advancing the tool-members successively, and substantially in the direction of the axis of the tool, as they approach the surface of the work in the rotation of the tool.

27. A stitch-impression machine having, in combination, a rotatively-mounted tool comprising a plurality of work-engaging members arranged in a circle, and means for moving each tool-member substantially in the direction of the axis of the tool while it is in contact with the work to burnish the impression.

28. A stitch-impression machine having, in combination, a work-support for supporting a shoe, a rotatively-mounted tool comprising a plurality of members arranged in a circle, each tool-member having an extremity provided with an impression-forming tooth and formed to enter the crease between the shoe-upper and the welt or sole-margin of a shoe on the work-support, means for rotating the tool, and means for advancing the tool-members longitudinally with respect to said teeth and into the crease as they approach the work-support and for retracting the tool-members as they recede from the work-support.

29. A stitch-impression machine having, in combination, a rotatively-mounted tool comprising a plurality of bars formed to engage the work at their forward ends and arranged in a generally-cylindrical form, and means for sliding the bars independently and longitudinally in succession to advance and retract them as the tool rotates.

30. In a machine of the class described, a rotary holder and an indenting member movable therein substantially parallel to the axis of rotation.

31. In a machine of the class described, a plurality of indenting members arranged approximately in a circle and movable successively into engagement with the projecting margin of the sole of a shoe, and means to move the members in the general direction of the axis of the circle as they approach the work during the continuous indenting operation.

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

EDWIN F. MOWER.

Witnesses:

WILLIAM H. TREEN,
J. HARRY STILES.