No. 860,376. PATENTED JULY 16, 1907.

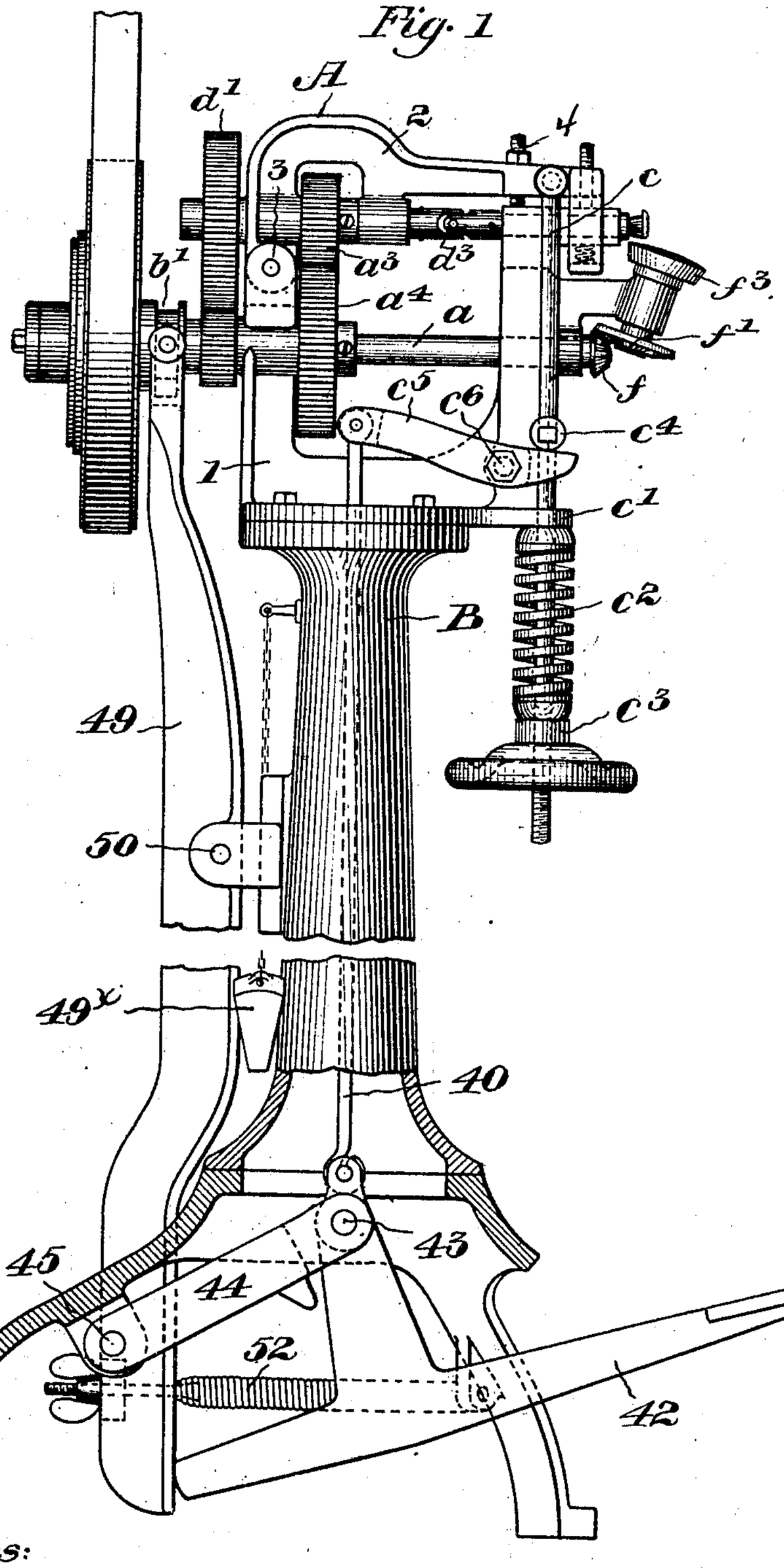
J. J. HEYS.

STITCH IMPRESSION MACHINE.

APPLICATION FILED OCT. 13, 1905.

3 SHEETS—SHEET 1.

Fig. 1



Witnesses:

Horace A. Crossman

Robert H. Kammler.

Inventor:

John J. Heys.

by Emery Booth & Yuell

Attys.

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3 SHEETS—SHEET 3.

Fig. 3.

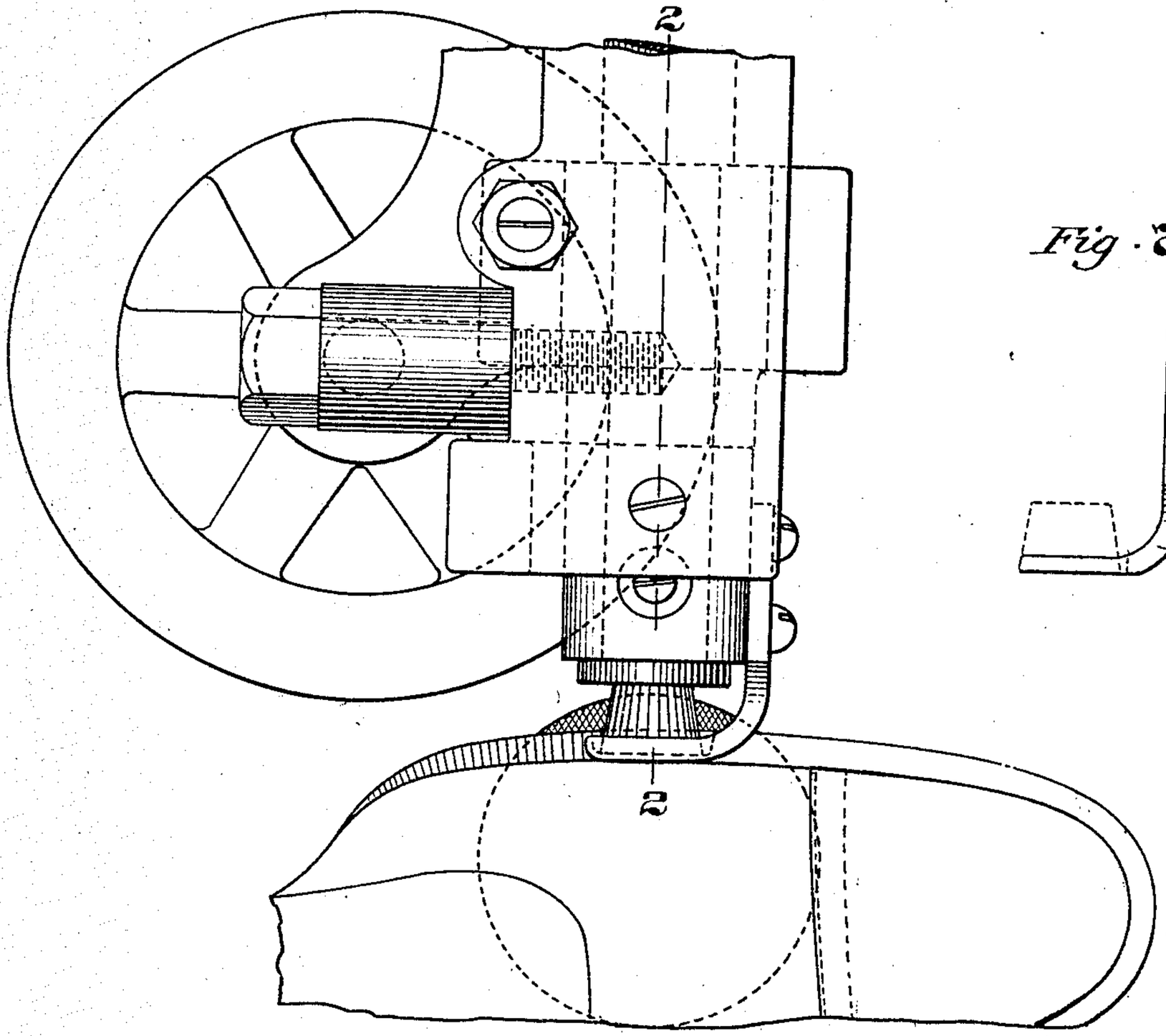


Fig. 7.

Fig. 5.

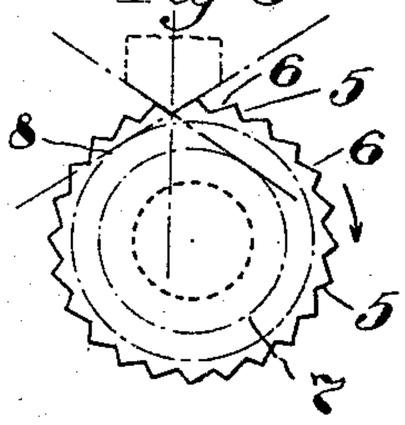


Fig. 4.

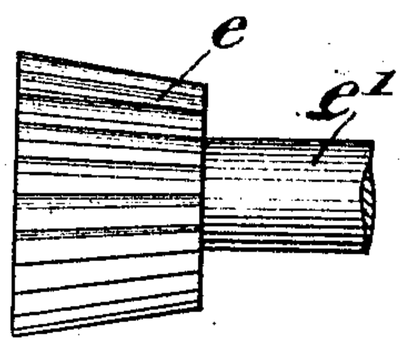


Fig. 6.

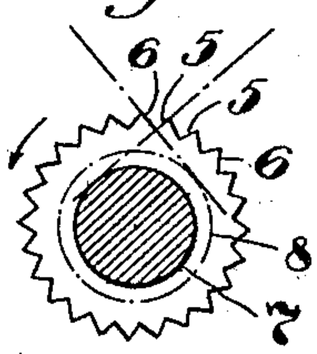
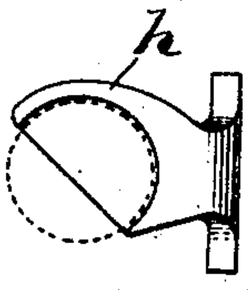


Fig. 8.



Witnesses:
Horace A. Crossman
Robert H. Kammler.

Inventor:
John J. Heys.
by Emery, Booth & Howe
Attys

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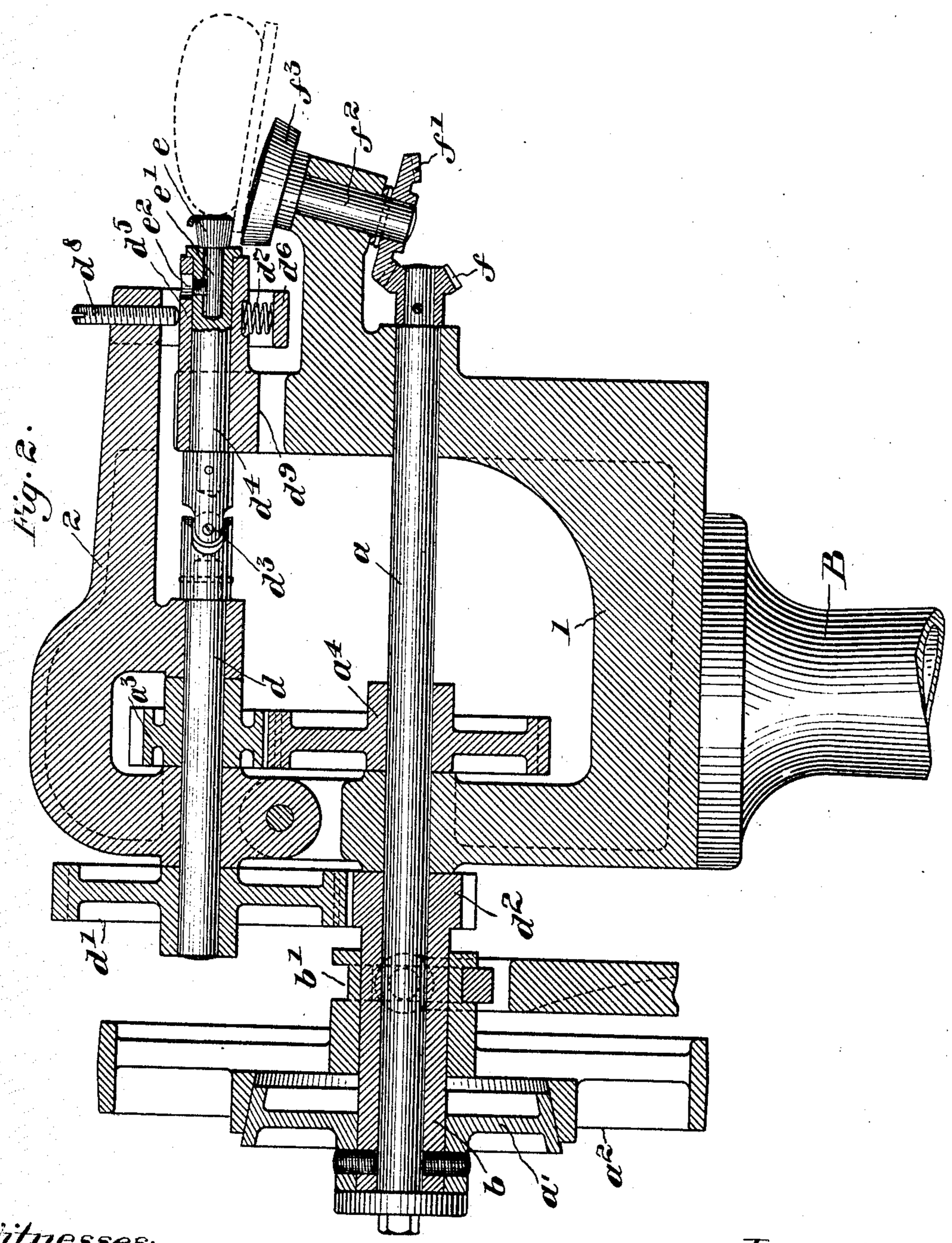
3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
Horace A. Crossman
Robert H. Kammler.

Inventor:
John J. Heys.
by Emery Booth Howell
Attys.

UNITED STATES PATENT OFFICE.

JOHN J. HEYS, OF LYNN, MASSACHUSETTS, ASSIGNOR TO MANUFACTURERS MACHINE COMPANY, OF MONTCLAIR, NEW JERSEY, A CORPORATION OF NEW JERSEY.

STITCH-IMPRESSION MACHINE.

No. 860,376. Specification of Letters Patent. Patented July 16, 1907.

Application filed October 13, 1905. Serial No. 282,590.

To all whom it may concern:

Be it known that I, JOHN J. HEYS, a citizen of the United States, residing at Lynn, in the county of Essex, Commonwealth of Massachusetts, have invented an Improvement in Stitch-Impression Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention aims to provide an improved machine for producing what are known as stitch impressions upon the sole extensions of boots and shoes. These machines are sometimes known as wheeling machines, because customarily equipped with a wheel that is corrugated in a direction approximately parallel to its axis, so that when the wheel is rolled along the sole extension under pressure, it will produce closely arranged ridges or corrugations thereon lying perpendicular to the sole edge.

My invention comprises various features of arrangement and construction designed to facilitate the operation of wheeling the sole edge and to improve the quality of work produced. These features will be best understood from a description of a machine illustrating one embodiment of my invention.

In the drawings illustrating such a machine,—Figure 1 shows the machine in side elevation, partially broken away and also partially in section; Fig. 2 is an enlarged vertical longitudinal section of a machine head, the section being taken on the dotted line 2—2, Fig. 3; Fig. 3 is a top or plan view of a part of the machine head, on an enlarged scale; Fig. 4, a detail in side elevation of the impression tool or wheel; Fig. 5, a front view of Fig. 4; Fig. 6 a back view thereof; and, Figs. 7 and 8, top and front views respectively of the work guard.

In the particular embodiment of my invention selected for illustration herein and shown in the drawings, referring first to Fig. 1, the machine head A is mounted upon a column B, the base of which is shown in section to illustrate the treadle connections. This head has suitable bearings for the horizontal shaft *a*, carrying at its rear end (see Fig. 2) one member *a'* of a friction clutch, the other member of which, a^2, is the belt pulley loosely journaled upon the shaft itself or preferably upon a bushing *b*, loosely mounted upon said shaft. This belt pulley a^2 slides longitudinally on said bushing, the pulley hub being grooved circumferentially at *b'* to receive the forked upper end of a controlling lever 49, fulcrumed upon the column at 50. The lower end of this controlling lever 49 is drawn to the right by a spring 52, against the end of a treadle 42, fulcrumed at 43 in an arm 44, pivoted in turn at 45 upon the frame base. The free end of the arm 44 is connected with the lower end of a pull rod 40 that controls the separation of the coöperating members, for the introduction and removal of the work. This treadle and clutch controlling mechanism is the same as that illustrated in U. S. Patent No. 784,263, granted to me under date of March 7, 1905, to which reference may be had for a fuller and more detailed description, should one be deemed necessary. The characteristic of said machine, however, is that so long as the operator permits the treadle to remain in its elevated position, the clutch is operative to run the machine, and the coöperating working devices are also in operative relationship for performing work upon the shoe. When however, the treadle is depressed, it first acts to disengage the clutch and cut off the power, and by further and continued movement, separate the working devices to free the work.

To enable the operator to leave the machine at rest at any time without attendance and with no one to hold the treadle depressed, I have in the present instance, provided means conveniently in the shape of a wedge block 49× flexibly suspended as by a chain from a convenient part of the machine and which the operator, when he desires, may insert between the lever 49 below its fulcrum, and the adjacent portion of the column to hold the said lever in clutch disengaging position, even though the treadle be permitted to remain in elevated position. This constitutes one form of means for controlling the clutch independently of the treadle.

The machine head A, as here shown, comprises two parts or frames, the bottom or fixed frame marked 1 and the top or swing frame marked 2, they being hinged one to the other at 3, so that the upper frame that carries the wheel may be raised relative to the bottom part that carries the work support, for introduction and removal of the work. To this end said swing frame 2 has a connected drop rod *c* guided near its lower end by an ear *c'* on the bottom or fixed frame and projecting below said guiding ear to receive a spring c^2 seated at its upper end against said ear and at its lower end against an adjusting wheel c^3 threaded upon the lower end of the said rod. This spring tends to pull down the swing frame 2 into working position to press its impression wheel upon the shoe sole with a pressure that may be radially adjusted by means of the wheel c^3. Should the sole not be in position, this spring actuated movement is arrested by the stop screw 4.

Referring now to Fig. 2, the swing frame 2, near its pivot 3, has bearings for one section of the wheel shaft *d*, fitted at its rear end with a gear wheel d^4 in mesh with and driven by a pinion d^2 on and preferably forming a part of the bushing *b* referred to, sufficient play or

looseness of fit between the gears d', d^2 being maintained to permit the necessary swing of frame 2 for the introduction of the work between the table and the impression wheel. At its front end said shaft section d is connected by a universal joint d^3 with a second or front section of the frame shaft, d^4, which latter is journaled in a bearing box d^5 carried in a yoke d^6 depending from the front end of the swing fraime part 2. This box d^5 is supported from below upon a spring d^7 seated in the bottom of the yoke, which spring presses the said box upward against the adjustable stop screw d^8 tapped through the swinging frame 2. The inner end of the bearing box d^5 that is in front of the universal joint is square, or otherwise properly shaped to enter between and be guided by the arms of a fork d^9 on and forming a part of the fixed frame 1, so that the alinement of said bearing box and the shaft section carried with it is always maintained relative to the fixed frame 1, and the work support carried thereby. The front end of the shaft section d^4 is fitted to receive the stem e' of the frusto-conical impression wheel e shown best in Figs. 4 to 6 inclusive, said stem being fixedly held in and so as to be rotated by said shaft, by a set screw e^2, shown best in Fig. 2.

Referring to Fig. 2, the shaft a is projected through the front of the fixed frame 1 and is provided at its front end with a bevel gear f in mesh with a larger wheel f', journaled loosely in an arm of the frame and provided at its upper end with the work supporting table f^3. This table is rotated positively by and from the shaft a, which latter in turn is driven from the wheel shaft d by the intermeshing wheels a^3 and a^4, in order that the surface speed of the work table, at a point under and opposite the impression wheel e, may correspond exactly with that of the said wheel. By causing the work table thus to travel in the same direction as the impression wheel and at the same speed, the operator is better able to feed and guide the work, particularly when rounding pointed toes of shoes. It will be evident that the rotation of the work table tends naturally to swing the toe end of a shoe under and to be impressed by the wheel e, while at the same time tending to feed the shoe inward toward the impression wheel instead of outward and away from it. To receive this inward thrust and also to prevent damage to the shoe upper by contact with the face of the impression wheel, I have provided a guard h (Figs, 7 and 8) which partially encircles the outer end of said wheel and is properly smoothed and shaped to permit the shoe upper to be pressed against it without damage. Preferably this guard incloses or covers approximately ½ the front face of the impression wheel.

To lift the wheel away from the work supporting table for the introduction and removal of the work, the drop rod c (Fig. 1) is fitted with a roller stud c^4, which overlies the short end of a lever c^5, fulcrumed upon the frame at c^6 and connected at its inner end with the rod 40, referred to.

To operate the machine the operator depresses the treadle and, as described, first stops the machine and then through the same rod 40 and lever c^5, lifts the swing-frame 2, thereby to lift the impression wheel from the work table to permit of introduction of the sole edge. Upon its release, the treadle rises and first drops the swing-frame until the impression wheel rests upon the sole edge, and then moves in the clutch and starts the machine. Simultaneous rotation of the impression wheel and work supporting table causes the sole edge to be fed between them and at the same time to be impressed at its upper face by the corrugations or ridges of the impression wheel.

I have found that the action of the impression wheel in feeding or assisting in feeding the work, tends to distort what would otherwise be the impressions made by its ridges or corrugations and to eliminate this error and enable the said wheel while feeding to produce at the same time a perfectly symmetrical impression in the work, I have formed the corrugations or ridges thereof so that the sides of the same are not exactly symmetrical or even.

Referring to Fig. 5, for instance, the leading faces 5 of the ridges (the direction of feed being as indicated by the arrow) are more abrupt than the following faces 6, they being tangent, for instance, to a circle, 7, while the following faces 6 are tangent to a larger circle 8, so that the elongation of the stock produced by engagement of the leading or pushing faces of the ridges, results in producing an inclined face upon the work that is perfectly symmetrical when compared with the opposite faces produced by the following faces of the wheel ridges. I believe this to be entirely new in machines of this type.

The impression wheel of machines as heretofore made, have usually been provided with ridges or corrugations that taper in depth from the larger toward the smaller end of the wheel, much as the teeth of a beveled gear taper from the base toward the apex of the pitch cone, and since it is the larger end of an impression wheel that travels next the upper, the smaller end traveling along the outer edge of the sole, it is evident that the impressions at and near the outer edge of the sole, which ought for the best effect to be the more pronounced, are instead produced by the smaller end of the wheel and are more shallow than at their opposite or inner ends where more or less concealed in the crease of the shoe and where if at all they should be the more shallow. To correct this error, the ridges or corrugations upon the wheel of my machine are deeper than heretofore, at the inner or smaller end of the wheel, they being preferably of uniform depth from end to end of the wheel.

The surface speed of the wheel at the large end thereof, is, of course, higher than that at the small end; while the stock is fed at a speed which is a mean between the two; consequently the stock impressed by the deeper corrugations at the large end of the wheel, must be compacted more or less relative to the feed, and thereby made to appear deeper while at the smaller end of the wheel, next the outer and exposed edge of the sole, where the stock is fed at a higher speed than the surface speed of the wheel thereat, the stock is stretched and flattened more or less between the adjacent and already too shallow corrugations thereat. This stretching of the stock tends to reduce the depth of impression, and, with the wheels cut as heretofore, presenting shallower depressions next the inner diameter, where the tendency to stretch and flatten is greatest the very formation of the wheel has been calculated not only to permit but to emphasize the tendency to produce shallow indentations at the outer sole edge

where they should be deepest. By cutting the impression wheel in accordance with my invention, however, with the depressions deepened at the smaller diameter of the wheel as compared with what may be termed, for want of a better term, the true conical depth thereof, the flattening of the corrugation, by stretching, is counteracted, and, the required depth of impression is assured. The result is an impression effect to the eye that is symmetrical and uniform when viewed by the eye. Thus, the shapes of the ridges or corrugations upon the wheel correct the error that results from the feed of the stock, and also the error that heretofore has resulted from the necessary use of a frusto-conical wheel the smaller diameter of which travels along that edge of the sole where the best and most pronounced impression effect should be produced.

Referring to Fig. 2: the angle of presentation of the impression wheel to the work supporting table, may be adjusted to fit any angle of presentation of the welt in ordinary practice, by means of the stop screw d^8 and spring d^7 which raise or lower the said wheel to vary its alinement relative to its shaft section d, and thereby changes its angle of presentation to the work supporting table and the work thereon. In any adjusted position of said wheel it is held by the spring c^2 (Fig. 1) in contact with the work whatever the position of the latter. By holding the impression wheel in place by means wholly at the rear thereof, as by the clamping screw acting upon the wheel stem e', the front face of the wheel may be retained smooth and unbroken,—that is, free from the presence of any fastening means, such as might bruise or mar an upper contacting therewith.

Claim.

1. A machine of the class described comprising a frusto-conical impression wheel, the depressions in which from the larger to the smaller end of the wheel increase in depth as compared with the true cone surface.

2. As an article of manufacture a corrugated impression tool having a frusto-conically curved surface the depressions in which from the larger to the smaller end of the tool increase uniformly in depth as compared with the true cone surface.

3. As an article of manufacture an impression tool the depressions whereof present opposed faces of different tangential angles.

4. As an article of manufacture an impressing tool the depressions whereof present opposed faces of different tangential angles, said depressions from the larger to the smaller diameter of said wheel increasing in depth relative to the true cone surface.

5. A machine of the class described comprising an impression wheel the depressions whereof present opposed faces of different tangential angles.

6. A machine of the class described comprising a work support an impression wheel the depressions whereof present opposed faces of different tangential angles, said depressions from the larger to the smaller diameter of said wheel varying in depth relative to a true cone surface.

7. A machine of the class described comprising, in combination, a work table, an opposed impression wheel, a universally jointed shaft for said impression wheel, a carrier for said shaft, means for moving and maintaining the carrier in desired position with respect to the work table, and means for adjusting the impression wheel in said carrier towards and from the work table.

8. A machine of the class described containing in combination the feeding work table, an impression wheel shaft and its wheel universally jointed thereto, means to adjust the wheel end of said shaft relative to the opposite end thereof, and means to move the shaft toward and from said table while in said adjusted position.

9. A machine of the class described containing the fixed and swinging head frames, the rotatable work table mounted in said fixed frame, and means to move said table, the impression wheel and its universally jointed shaft mounted in said swinging frame, means to swing said frame and its said wheel, means to adjust said wheel in its swinging frame to vary the angle of its presentation to the rotatable work table, driving means, and connections between the same and the said table and shaft.

10. A machine of the class described comprising a corrugated frusto-conically faced tool, the corrugations of which are flanked by dissimilar counteracting faces arranged at different tangential angles to counteract the otherwise variable effect of the tool action.

11. A machine for operating upon the soles of boots and shoes comprising a feeding tool having corrugations, the opposed faces of such corrugations being of different areas to counteract the distorting impressions resulting from the feeding effort.

12. In a machine for operating upon the soles of boots and shoes, the combination of a work support, an impression wheel, a flexible shaft carrying said wheel, a swinging frame to which said shaft and wheel are connected, a yielding element and a single adjusting element for varying the angle of presentation of said wheel to the work support while permitting movement of the wheel with said frame.

13. In a machine for operating upon the soles of boots and shoes, the combination of the work support f^3, the impression tool e, the swinging frame 2 carrying the tool e, and the spring d^7 for moving the tool e in one direction, and adjusting device d^8 for moving the tool e in opposition to the said spring.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN J. HEYS.

Witnesses:
HONORAH J. BRESNAHAN,
EVERETT S. EMERY.