No. 616,432. Patented Dec. 20, 1898.

Z. BEAUDRY.

TOOL FOR FINISHING BOOT OR SHOE HEELS.

(Application filed Jan. 5, 1898.)

(No Model.) 2 Sheets—Sheet 1.

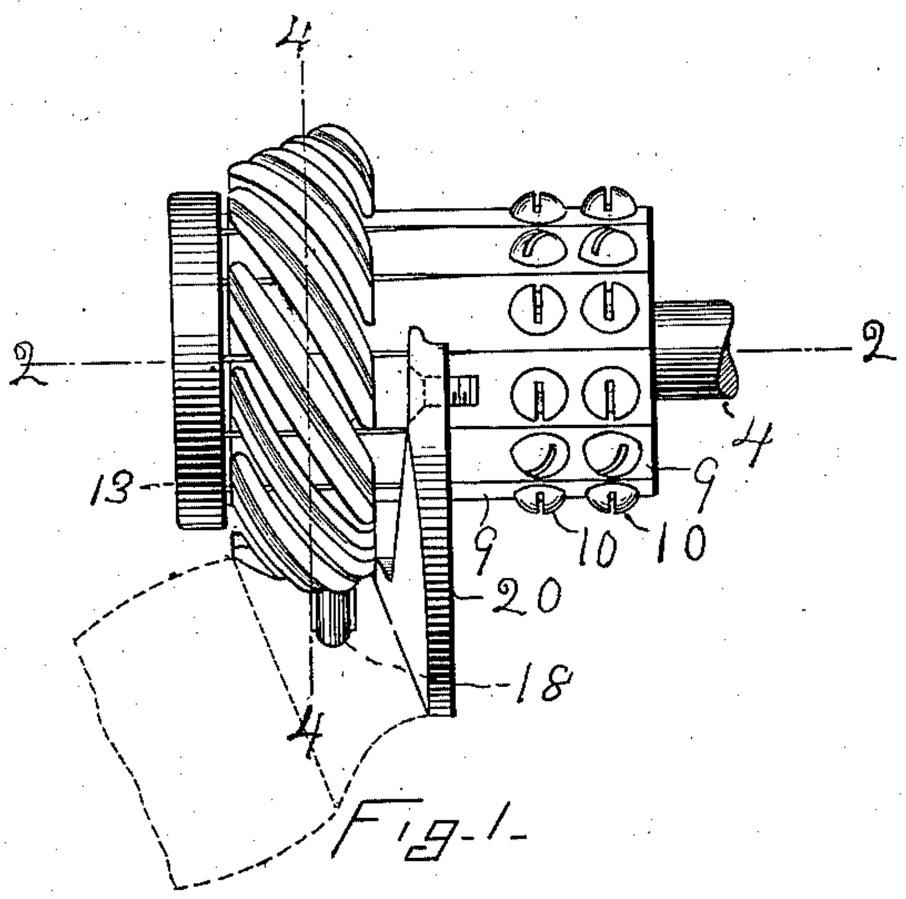

Fig. 1.

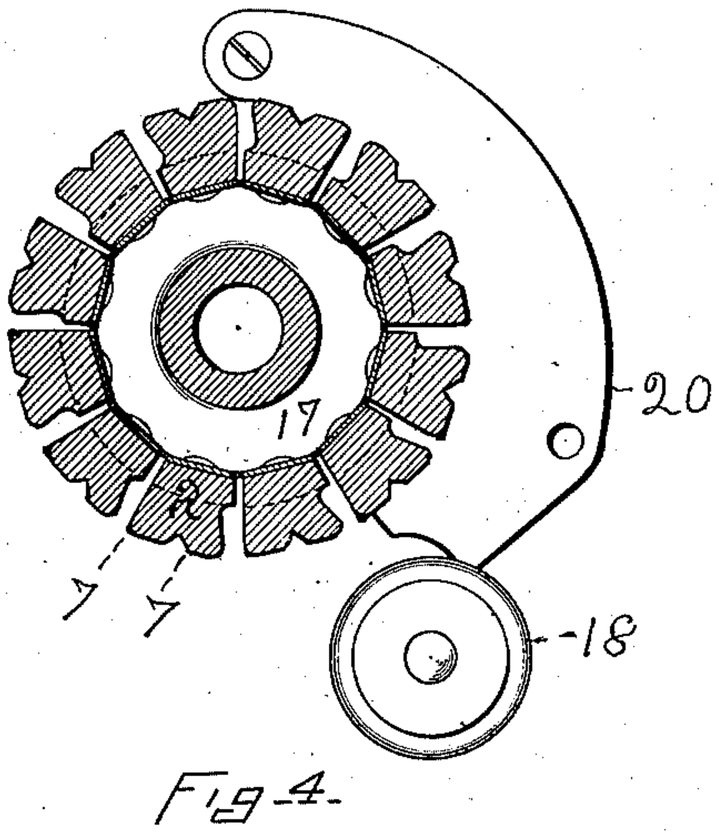

Fig. 4.

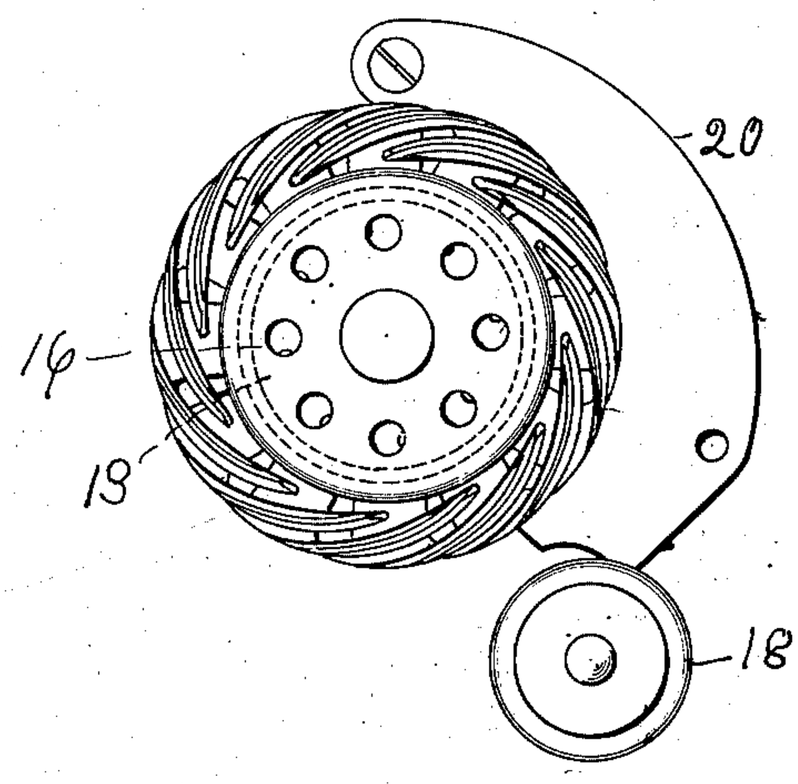

Fig. 3.

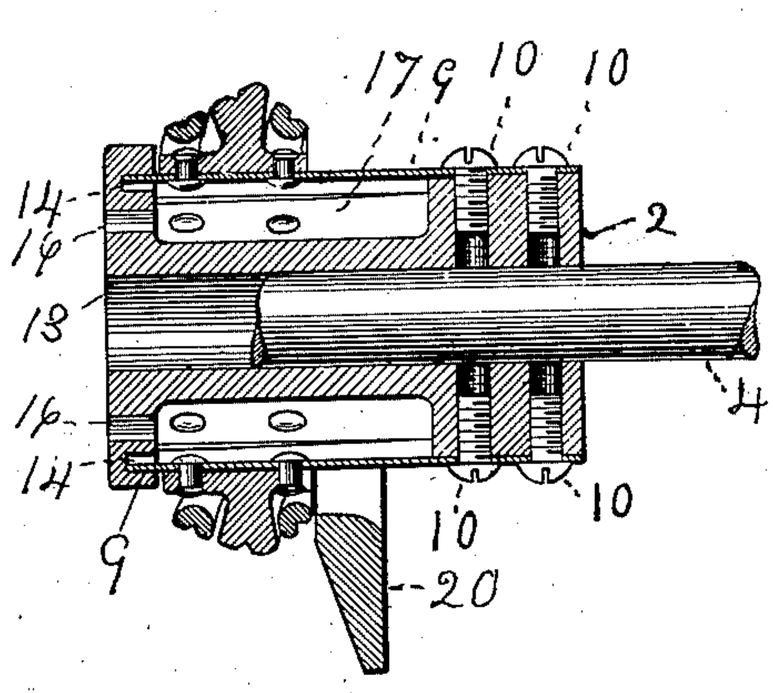

Fig. 2.

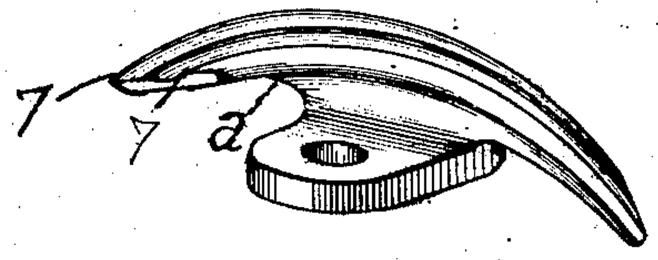

Fig. 5.

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Fig. 6.

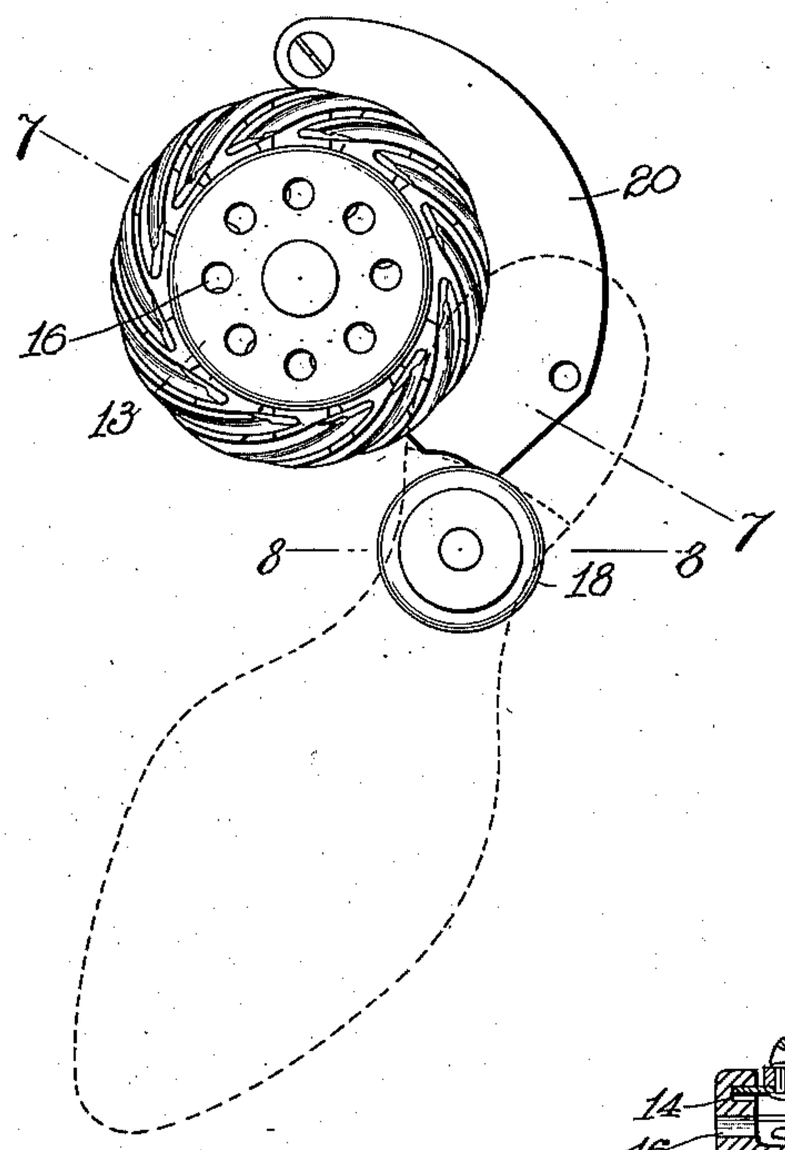


Fig. 7.

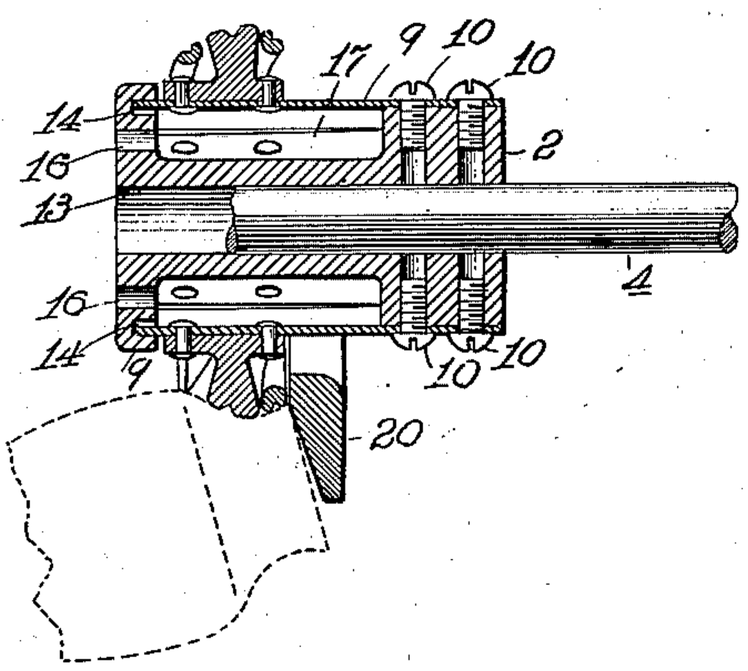
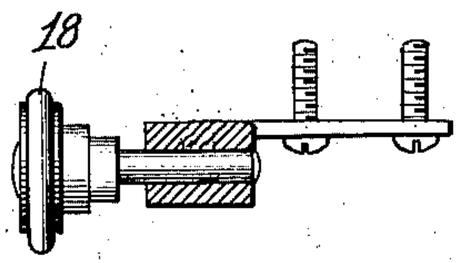


Fig. 8.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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TOOL FOR FINISHING BOOT OR SHOE HEELS.

SPECIFICATION forming part of Letters Patent No. 616,432, dated December 20, 1898.

Application filed January 5, 1898. Serial No. 665,632. (No model.)

To all whom it may concern:

Be it known that I, ZOTIQUE BEAUDRY, of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Tools for Finishing Boot or Shoe Heels, of which the following, read in connection with the accompanying drawings, is a specification.

This invention relates to a tool for smoothing and polishing and similarly finishing the edge surfaces of boot or shoe heels, having for its object to provide a tool capable of automatically adapting itself to the varying curves of the surface to be finished; and it comprises a tool provided with a working face composed of separately-acting work members adapted for yielding inwardly when subjected to external pressure and return to the normal position when said pressure is removed.

This invention consists of matters relating to the work members, to the arrangement of said members relatively to one another, and to the line of working movement; also, it pertains to the combination of the work members with a suitable carrier and work-rests for resting and gaging the position of the work, and it pertains to others matters of a minor character wherethrough the objects of this invention are best secured, all of which are hereinafter more fully described.

In the accompanying sheet of drawings is illustrated a tool designed for smoothing, polishing, and finishing heels of boots or shoes constructed and arranged for rapid operation rotatively in accordance with this invention.

Figure 1 is a top view. Fig. 2 is a longitudinal section on line 2 2 of Fig. 1. Fig. 3 is a front view. Fig. 4 is a vertical section on line 4 4 of Fig. 1. Fig. 5 is a perspective view of one of the work members detached. Figs. 6 and 7 are views corresponding to Figs. 1 and 2 and showing the shoe in position in dotted lines; and Fig. 8 is a detail, partly in section.

As carried out in the present instance the tool comprises a carrier 2, having a longitudinal central opening for the shaft 4, to which the carrier is secured in any suitable manner, said shaft being arranged to rotate in bearings and operated by any means suitable for the rotation of the shaft and tool attached to it.

In the tool represented each work member consists of a narrow block-bar *a*, preferably of cast metal, having an outer working face, which preferably is grooved longitudinally, as shown. Each work member is connected by a rivet or other suitable attaching medium to a spring 9, composed of flat strip material, the working face of the work member being disposed outwardly in a diagonal line crosswise of the spring. In the tool represented there are preferably twelve of these work members, supported each by a separate spring 9. To this end the periphery or circumferential face of carrier 2 is made twelve-sided. On each of these sides one of the springs 9, carrying one of the work members, is mounted and secured to the carrier 2 by screws 10. Each spring, being thus secured by one end to the carrier for rotation therewith, has its outer end free and holds by its free end the work member, with the working face of said member outwardly. By this arrangement the work members are held in circular series, with the outwardly-disposed working faces forming collectively an approximately circular circumferential surface, each face being in position with its longitudinal axis or longitudinal area—meaning the middle line or surface in the direction of its length—and its transverse axis or transverse area—meaning thereby its middle line or surface in the direction crosswise of the longitudinal axis—also disposed in lines of direction oblique to the line of its working movement, by which is meant the line of forward movement taken by the tool in doing its work, it being in the present instance the line of rotation of the carrier 2. (Indicated by arrow 12.) The work members are disposed side by side diagonally, with small open spaces between them, so that in either a longitudinal or transverse section of this portion of the carrier a plurality of the working faces are included, as shown in Figs. 2 and 4, respectively.

Connected with the carrier, in the present instance shown as one material therewith, is a core part 13, its body portion being within the circle of the work members, its outer end being flanged circumferentially. Said flange has in its side face an annular groove 14, into which is projected the outer free end of each spring 9, its normal position being against the outer side wall of the groove. Also in the

flange are holes 16, extending in diagonal lines oblique to the line of its rotation from the outer face of the flange backwardly therethrough to the chamber or space 17, wherethrough in rapid rotation of the tool air will be caused to circulate inwardly against the work members, and thence outwardly through the spaces between the work members and against the surface of the material worked upon to prevent the work members being overheated and the work-surface from being thereby damaged. If desired, heat may in like manner be drawn from a flame to artificially heat the work members.

Having support in connection with the machine-frame or other suitable medium is a rest 18, on which the edge face of the heel is rested while being turned in operation of the tool. Supported in a similar manner is the vertically-arranged plate 20, against which the bottom or tread face of the heel is pressed for gaging the position of the work and preserving the desired alinement of the work-surface relatively to the working faces of the tool. Said plate has its bearing-face cut away or beveled from the tool outwardly and backwardly to permit of supporting the heel with its axis inclined relatively to the axis of the tool and allow space for turning the heel so placed during operation.

It will be found convenient and economical to give final shape and finish to the working faces of the tool as a whole after the work members are in place by revolving the tool against a grinder of emery or other suitable material, and thereby giving lines of substantially circular curvature to the working faces in the direction of working movement and lines of irregular curvature transversely, which should be made to conform approximately near to the transverse line of the intended heel-face, the flexible character of the tool work members being depended upon for treating the minor irregularities of intended curvature in the heel-surface, so that by a single presentation and one turning of the heel longitudinally the entire edge surface thereof will be acted upon.

In operation of the machine the boot or shoe is supported in the hands of the workman and presented with the edge face of the heel on the rest 18, its bottom or tread face being set against the plate 20 and one corner of the heel adjacent to the tool. It is then in position to be pressed against the tool-face and turned by hand longitudinally for bringing the whole face of the tool into bearing with the working faces of the tool members during rapid revolution of the tool-carrier, preferably at a very high rate of speed. This arrangement of the work members in a circular line with the working faces disposed circumferentially and oblique to the line of working movement gives a peculiar working face to the tool, which, in further consequence of the yielding of the work members inwardly, will conform generally to the hollow transverse curvature of the heel, so that a single turning of the heel longitudinally, occupying about five seconds only, is all that commonly is required for the finishing operation.

Though not intending to limit this invention, it is observed that in the tool shown the springs 9 are of length suitable for yielding spirally to a degree adapted for permitting a limited rocking of the work members, that this length of the springs further operates for causing the movement of the work members inwardly to take place in a direction approximately at right angles to the longitudinal axis of the tool, which rocking and inward movements are caused by the pressure of the work against the working faces and are limited by the inner wall or face of the annular groove 14.

The working faces are preferably disposed side by side transversely for giving touch with the work by a plurality of said faces on the work-surface at one time, whereby some are remaining on the work when succeeding ones are introduced thereto, the result being a better adaptation of the tool to the work-surface and a more rapid operation of the finishing process, besides a better steadying of the work and easier action. This arrangement, too, allows of the work members being sharpened, so as to act upon the work effectively without requiring a pressure sufficient to endanger separating the heel-lifts, to which end the working faces are made of little distance transversely and preferably are grooved longitudinally and are shaped with angular or slightly-rounded working faces 7 along the marginal work-engaging side thereof. In operation these working faces 7 spread the wax or filling material used, if any, and by attacking the raised parts of the work coöperate with the working faces proper, which effect a rapid pounding and rubbing action, whereby the work-surface is smoothed and the material of the separate heel-lifts pounded and interworked for closing up the spaces and hiding the lines of division or separation therebetween and causing the heel to appear as one solid piece. In cases where a slicking of the work is most to be desired the tool may be designed without the said formations 7, and particularly the sharpness thereof omitted, and other modifications are obvious without departing from the spirit of this invention.

Having now described this invention and in what manner the same is to be performed, I declare that what I claim is—

1. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an oblique outer working face, and means carried by the carrier, holding the work members in series one after another, with the working faces disposed outwardly, each of the said working faces being in position with its longitudinal axis oblique to the line of its working movement, and the device adapted for yielding to permit the work members to be moved inwardly,

during operation, for shifting the position of the working face, substantially as described.

2. A tool of the character indicated, comprising, in combination a carrier, a plurality of work members having each an outer working face, and means carried by the carrier, for holding the work members in series with the said working faces disposed outwardly, each of the working faces being in position with its longitudinal and its transverse axial lines running oblique to the line of its working movement, and the device being adapted for yielding to permit the work members to be moved inwardly, during operation, for shifting the position of the working face, substantially as described.

3. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier, holding the work members in circular series with the working faces disposed outwardly and forming collectively an approximately circular circumferential surface, each working face being in position with its longitudinal axis disposed obliquely transverse of the line of its working movement, and the device adapted for yielding to permit the work members to be moved, during operation, for shifting the position of the working faces, substantially as described.

4. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier, holding the work members in circular series with the said working faces disposed outwardly and forming collectively, an approximately circular circumferential surface, each work member being in position with its longitudinal axis obliquely transverse of the line of its working movement, the device being adapted for yielding to permit the work members to be moved inwardly, during operation for shifting the plane of the working face, and the relative arrangement of the combination operating to cause the said movements of the work members inwardly to take place in paths or lines of movement approximately at right angles to the axis of said circumferential surface, substantially as described.

5. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier for holding the work members in series one after another, with the said working faces disposed outwardly, each working face being disposed obliquely transverse of the line of its working movement and the device adapted for yielding to permit the work members to be moved inwardly, during operation, for shifting the position of the working face, and means for actuating the members yieldingly in the direction opposed to said inward movements, substantially as described.

6. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier for holding the work members in circular series with the said working faces disposed outwardly and collectively forming an approximately circular circumferential surface, the device being adapted for yielding to permit the work members to be moved inwardly, during operation, for shifting the position of the working face, and stop contrivances arranged for limiting the amount of said movement inwardly, substantially as described.

7. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each a grooved outer working face, and means carried by the carrier, holding the work members in circular series, with the said working faces disposed outwardly, and forming collectively an approximately circular circumferential surface, each work member being in position with the groove in its said working face disposed obliquely transverse of the line of its working movement, and the device adapted for yielding to permit the work members to be moved, during operation, for shifting the position of the working face, substantially as described.

8. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier for holding the work members in circular series, with the working faces disposed outwardly and collectively forming an approximately circular circumferential surface, and the device adapted for yielding to permit of the work members rocking in direction of the line of working movement, substantially as described.

9. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier for holding the work members in circular series, with the working faces disposed outwardly and collectively forming an approximately circular circumferential surface, and the device adapted for yielding to permit the work members to be moved inwardly and rocked longitudinally, substantially as described.

10. A tool of the character indicated, comprising, in combination a carrier, a plurality of independent work members having each an outer working face of less distance transversely than the transverse or width distance of the tool, and means carried by the carrier and holding the work members in circular series, with said working face disposed outwardly and collectively forming an approximately circular circumferential surface, each working face being positioned with its longitudinal axis obliquely transverse to the line of its working movement, and the device adapted for yielding to permit the work

members to be moved, during operation, for shifting the position of the working face, substantially as described.

11. A tool of the character indicated, comprising, in combination, a carrier, a plurality of independent work members having each an oblong outer working face of less distance transversely throughout its length than the transverse or width distance of the tool, and means carried by the carrier for holding the work members in circular series, with said working faces disposed outwardly and collectively forming an approximately circular circumferential surface, each working face being in position with its longitudinal axis obliquely transverse to the line of its working movement, and the device adapted for yielding to permit the work members to be moved, during operation, for shifting the position of the working face, substantially as described.

12. A tool of the character indicated, comprising, in combination a carrier, a plurality of independent work members having each an oblong outer working face of less distance transversely than the width distance of the tool, and means carried by the carrier, holding the work members in circular series, with said working faces disposed outwardly and forming collectively an approximately circular circumferential surface, each working face being disposed with its longitudinal axis obliquely transverse to the line of its working movement and continuing from one to the opposite side of the tool, and the device adapted for yielding to permit the work members to be moved, during operation, for shifting the position of the working face, substantially as described.

13. A tool of the character indicated, comprising, in combination a carrier, a plurality of independent work members having each an outer working face of less distance transversely than the transverse or width distance of the tool, and means carried by the carrier and holding the work members in circular series, with said working faces disposed outwardly and collectively forming an approximately circular circumferential surface, each working face being positioned with its longitudinal axis obliquely transverse to the line of its working movement, the device being adapted for yielding to permit the work members to be moved, during operation, for shifting the position of the working face, and the relative arrangement of the combination operating to cause the said movement of the work members to take place in a path or line of movement approximately at right angles to the axis of said carrier, substantially as described.

14. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier, holding the work members one after another in circular series, and side by side transversely, whereby the said working faces are disposed outwardly and forming collectively an approximately circular circumferential surface, a plurality of the working faces being included in the transverse or width section of the surface, and the device being adapted for yielding to permit the work members to be moved, during operation, for shifting the position of the working faces, substantially as described.

15. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and means carried by the carrier for holding the work members one after another in circular series and side by side whereby the said work-faces are disposed outwardly and forming collectively a substantially circular circumferential surface, and a plurality of the working faces being included in the longitudinally and also the transverse section of the said surface and the device adapted, for yielding to permit the working members to be moved, during the operation, for shifting the position of the working faces, substantially as described.

16. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having spiral outer working faces and means carried by the carrier for holding the work members one after another in circular series and side by side, whereby the said working faces are disposed outwardly and forming collectively a substantial circular circumferential surface, each face being longitudinally and also transversely oblique to the line of its working movement, a plurality of the work-faces being included in the longitudinal and also in the transverse or width section of the device, and the device adapted for yielding to permit the work members to be moved, during the operation, for shifting the position of the working face, substantially as described.

17. A tool of the character indicated, comprising, in combination, a carrier, a plurality of independent work members, having each an outer working face of less width transversely than the transverse width of the tool, and means carried by the carrier for holding the work members in circular series, one after another and side by side transversely, whereby the said working faces are disposed outwardly and forming collectively a substantially circular circumferential surface, each face being in position with its longitudinal axes running oblique to the line of its working movement from one to the opposite side of the tool, a plurality of the working faces being included in the longitudinal and also in the transverse or width section of the tool and the device adapted for yielding to permit the working members to be moved, during operation, for shifting the position of the working faces, substantially as described.

18. A tool of the character indicated, comprising, a carrier, a plurality of independ-

ently-acting work members, constructed with working faces arranged for operation and adapted for movement inwardly substantially as described, combined with means for resting and gaging the position of the work relatively to the working faces, substantially as described.

19. A tool of the character indicated, comprising, a plurality of independently-acting work members having working faces and arranged for operation and movement inwardly, substantially as described, combined with edge and bottom rests disposed for resting and gaging the position of the work relatively to the working faces, substantially as described.

20. A tool of the character indicated, comprising, a plurality of independently-acting work members having working faces and arranged for operation and movement inwardly, substantially as described, combined with means for resting and gaging the position of the work relatively to the working faces, the combination being adapted for resting the work with the axis of the heel oblique to the axis of the tool-carrier, substantially as described.

21. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face as described, and connections carried by the carrier for holding the work members in circular series, with the said working faces disposed outwardly and collectively forming a substantially circular circumferential surface, said connections being adapted for yielding to permit the work members to be moved inwardly, during operation, and the relative arrangement of the device operating to cause the said movement of the work members to take place in paths or lines of movement approximately at right angles to the major axis of the carrier, substantially as described.

22. A tool of the character indicated, comprising, a carrier, a plurality of work members, having each an outer working face, and means carried by the carrier for holding the work members in circular series with the said working faces disposed outwardly, and collectively forming an approximately circular circumferential surface, with open spaces between the members, and the device adapted for yielding to permit the work members to be moved during operation, for shifting the position of the working face, and means for circulating air artificially through the said open spaces, substantially as described.

23. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face and separate connections carried by the carrier for holding the work members in circular series with the working faces disposed outwardly and forming collectively an approximately circular circumferential surface and said device adapted for yielding to permit the work members to be moved for shifting the plane of the working face, substantially as described.

24. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and connections carried by the carrier, holding the work members in circular series with the working faces disposed outwardly and forming collectively a circular circumferential surface, the said connections also yielding to permit inward and rocking movements of the work members, substantially as described.

25. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face, and connections carried by the carrier, holding the work members in circular series with the working faces disposed outwardly and forming collectively an approximately circular circumferential surface and the said connections adapted for yielding to allow movement of the work members inwardly for shifting the plane of the working faces, and a stop contrivance limiting said movement, substantially as described.

26. A tool of the character indicated, comprising, in combination, a carrier, a plurality of work members having each an outer working face and separate spring connections carried by the carrier, said spring connections having one end free of the carrier and holding each a work member on the free end thereof, the work members being disposed with the working faces in an approximately circular circumferential surface and the spring connections adapted for yielding, substantially as described.

27. A tool for finishing boots and shoes comprising a carrier which has yieldingly supported thereon a working member whose working face is disposed diagonally to the direction of travel, whereby said member moves approximately endwise upon the surface to be operated upon.

28. A tool for finishing boots and shoes comprising a carrier which has yieldingly supported thereon a series of working members whose working faces are disposed diagonally to the direction of travel, whereby said members move approximately endwise upon the surface to be operated upon.

29. A tool for finishing boots and shoes comprising a carrier which yieldingly sustains a series of independently-supported diagonally-disposed working members which follow each other successively and move endwise upon the surface to be operated upon.

Signed at Lynn this 3d day of December, A. D. 1897.

ZOTIQUE BEAUDRY.

Witnesses:
C. B. TUTTLE,
A. M. TUTTLE.