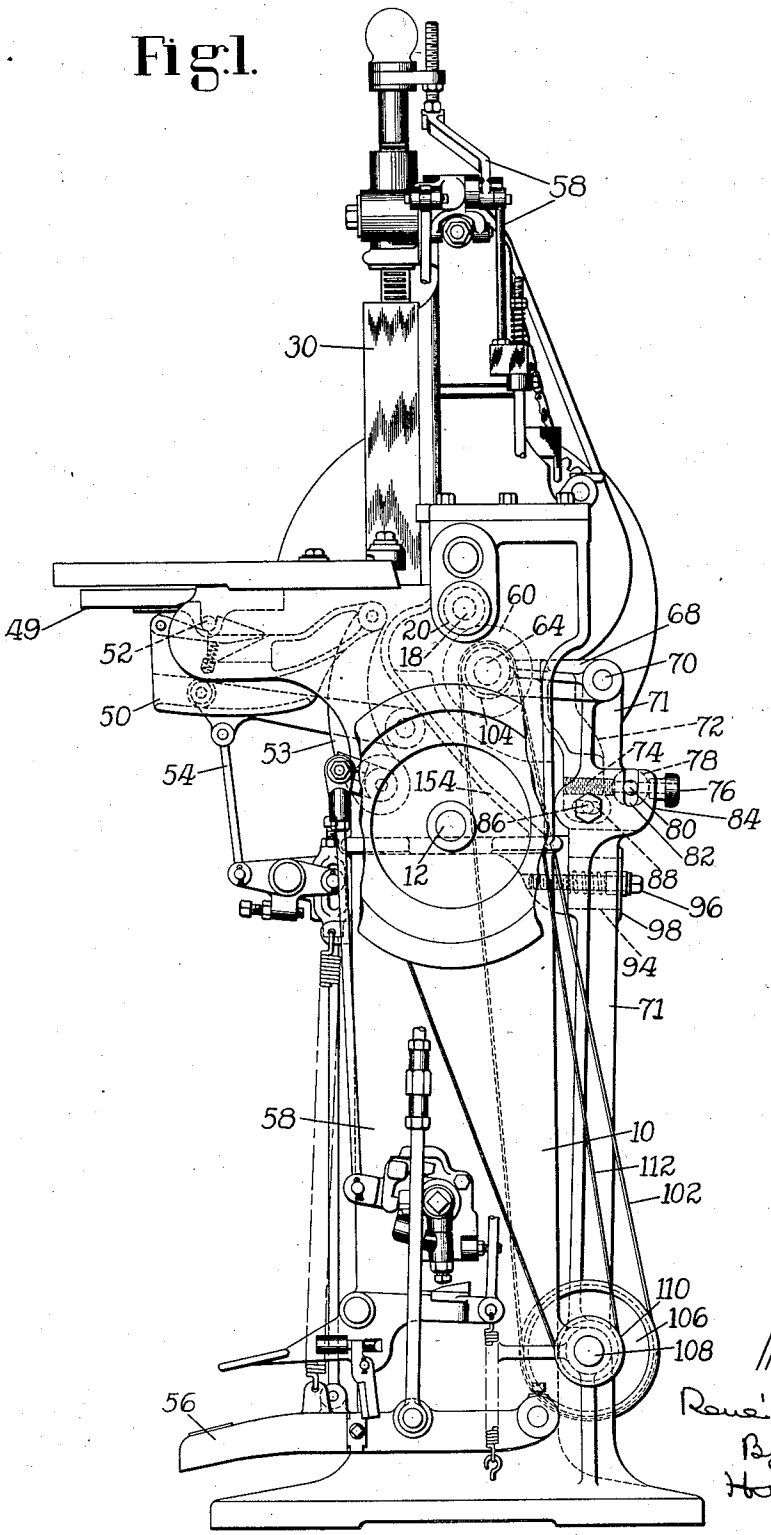
May 14, 1935. R. E. DUPLESSIS 2,000,936

METHOD OF AND MACHINE FOR PERFORMING OPERATIONS UPON SHOE PARTS

Filed Sept. 8, 1933 3 Sheets-Sheet 1

Fig. 1.



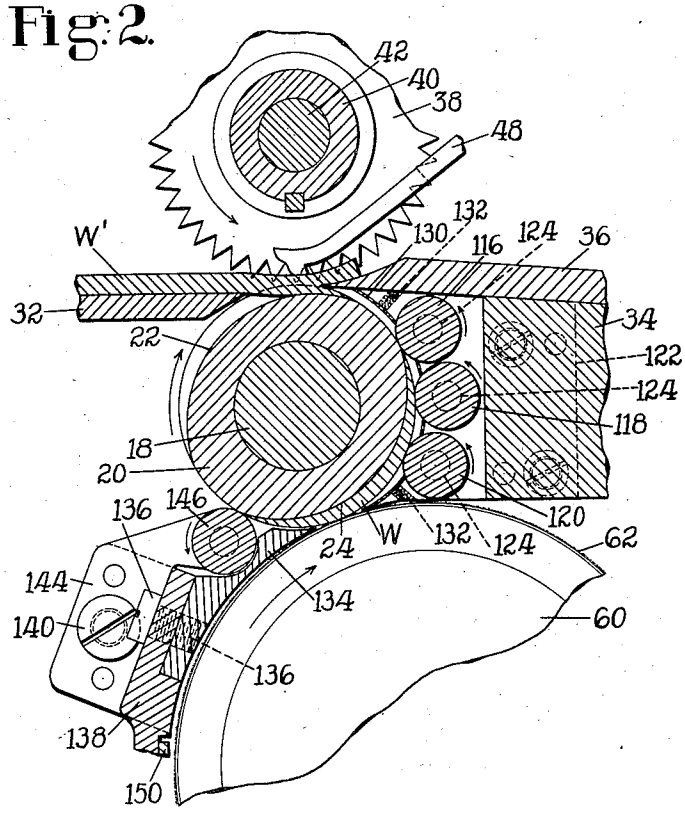
INVENTOR.
René E. Duplessis
By his Attorney
Harlow M. Davis

May 14, 1935. R. E. DUPLESSIS 2,000,936

METHOD OF AND MACHINE FOR PERFORMING OPERATIONS UPON SHOE PARTS

Filed Sept. 8, 1933 3 Sheets-Sheet 2

Fig. 2.



INVENTOR.
René E. Duplessis
By his Attorney
Harlow M. Davis

May 14, 1935. R. E. DUPLESSIS 2,000,936

METHOD OF AND MACHINE FOR PERFORMING OPERATIONS UPON SHOE PARTS

Filed Sept. 8, 1933 3 Sheets-Sheet 3

Fig. 3.

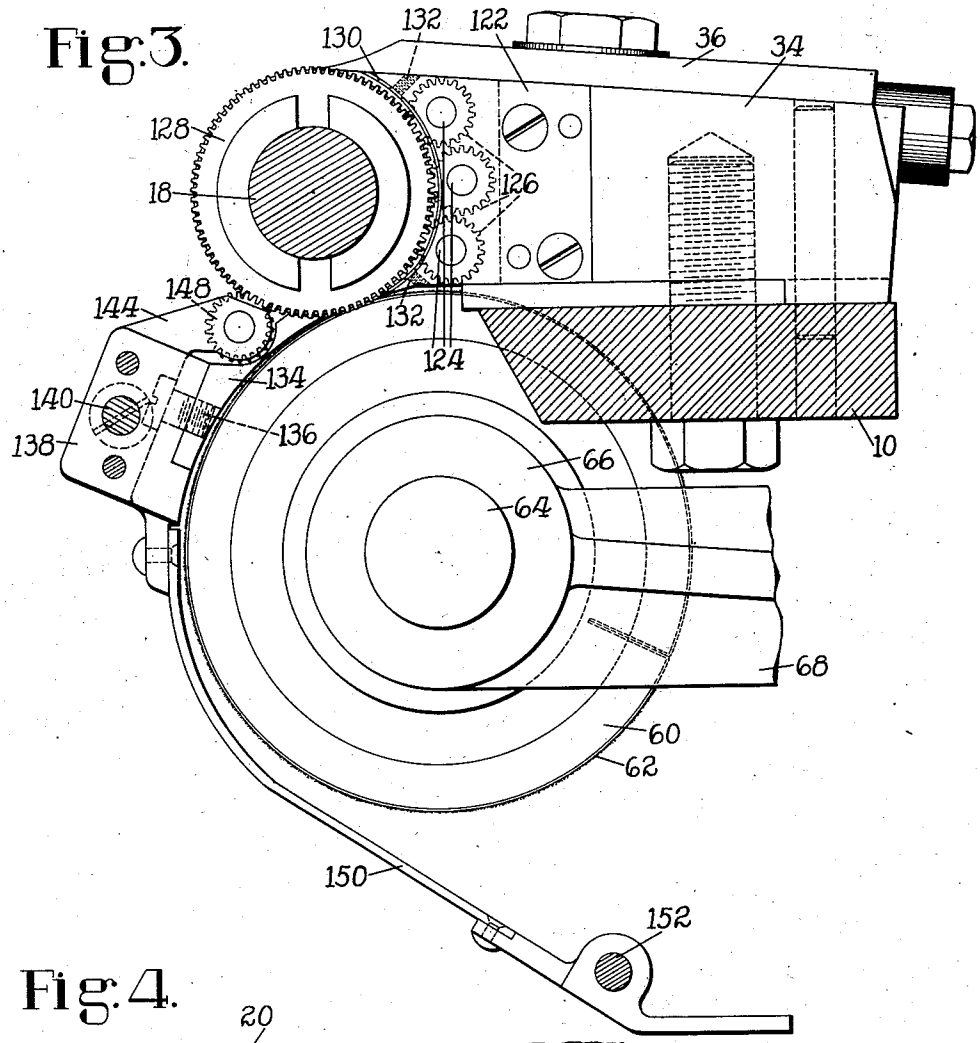
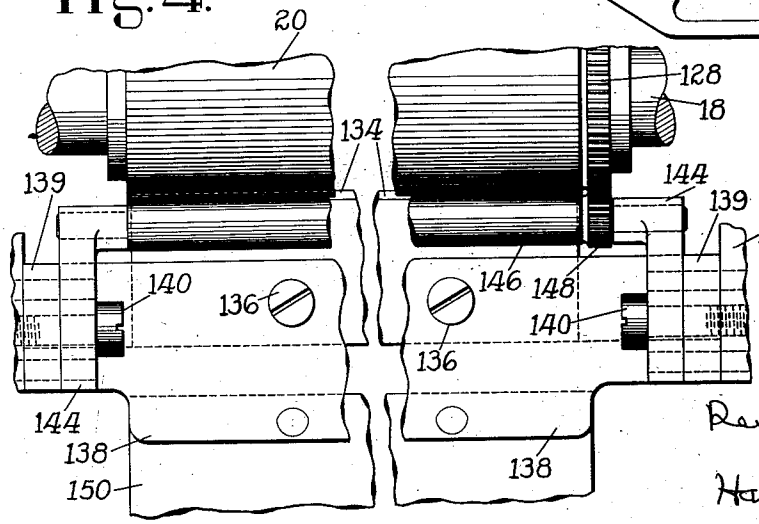


Fig. 4.



INVENTOR.

Raul E. Duplessis

By his Attorney

Harlow M. Davis

Patented May 14, 1935 2,000,936

UNITED STATES PATENT OFFICE

2,000,936

METHOD OF AND MACHINE FOR PERFORMING OPERATIONS UPON SHOE PARTS

René E. Duplessis, Beverly, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application September 8, 1933, Serial No. 688,644

21 Claims. (Cl. 12—61)

This invention relates to methods of and machines for performing operations upon shoe parts and like articles, and is herein described and illustrated as embodied in a machine for skiving and buffing box toes and counters. It is customary to skive such articles to a feather edge and the skiving operation sometimes leaves the surface of the article in such condition that buffing may be desirable. In such cases the buffing has hitherto been carried out as a subsequent operation, requiring the use of a separate machine.

It is an object of the present invention to provide a method of skiving and buffing a work piece in a single operation. In accordance with a feature of the invention, a work piece is pressed into a matrix and then skived to a form determined by the matrix, and while the work piece is still in the matrix the exposed surface of the work piece is buffed. Conveniently and in accordance with a feature of the invention, the matrix with the work piece pressed into it is first moved past a skiving tool and then past a buffing tool to cause the exposed surface of the work piece to be buffed.

A further object of the invention is to provide a machine for skiving and buffing work pieces such as counters and box toes. In accordance with this object, a feature of the invention consists of a machine organization comprising a feed member, a skiving tool for operating on a work piece as the work piece is advanced by the feed member, and a buffing tool constructed and arranged to operate upon the skived surface of the work piece during the continued advance of the work piece by the feed member. In the illustrated machine, the skiving means consists of a knife and the buffing means consists of an abrasive covered roll. In order to determine the form to which the work piece is to be skived, a matrix is provided which, in the illustrated machine, consists of a driven roll having a depression into which the work piece may be pressed. The shape of the matrix is usually such as to cause the skiving knife to leave the central portion of the work piece more or less flat while beveling the edge portions. The matrix roll of the illustrated machine not only performs the function of a matrix but serves also as a means for feeding the work piece past the skiving knife and past the buffing roll. There is a very important advantage in the above-described provision for buffing the work piece while the work piece is still pressed into the matrix in that it enables the buffing roll to operate upon both the beveled and the unbeveled portions of the exposed surface of the work piece without increased pressure upon the locality at which these two portions merge into each other. A further advantage resides in the fact that such an arrangement enables the skiving and buffing of the work piece to be carried out in a single operation and by a single machine, saving a considerable amount of time in requiring less handling of the work piece and also saving the space which would be occupied by an additional machine.

These and other features of the invention will appear from an inspection of the accompanying drawings, which illustrate a preferred embodiment of the invention, and from the following detailed description of the construction and operation of the machine illustrated therein.

In the drawings,

Fig. 1 is a view in side elevation of the improved machine;

Fig. 2 is a sectional view in side elevation of the skiving and buffing members together with portions of the feed mechanism;

Fig. 3 is a view in side elevation of portions of the interior mechanism; and

Fig. 4 is a fragmentary view in front elevation (looking down at a slight inclination) of the parts shown in Fig. 3.

The supporting structure of the illustrated machine consists of a frame 10 in which is journaled a main shaft 12 which is driven by any convenient source of power. Also journaled in the frame 10 is a shaft 18 upon which is mounted a matrix roll 20 having formed in it a pair of depressions 22 and 24. In Fig. 2 a work piece W is shown as embedded in the depression 24. The shaft 18 is driven by suitable gearing from the main shaft 12.

Secured upon the upper portion of the frame 10 is a magazine 30 (Fig. 1) for a vertical stack of work pieces. The lowermost work piece of the stack rests upon a work table 32 (Fig. 2) and it is advanced in timed relation to the matrix roll 20 in such a way as to cause it to register with one or another of the matrix depressions 22 or 24. Secured in the upper portion of the frame 10 is a block 34 upon the upper face of which is mounted a skiving knife 36 having its cutting edge extending close to the undepressed portion of the periphery of the matrix roll 20. As the lowermost work piece of the stack is advanced into one of the depressions, it is carried by the rotation of the roll 20 past the skiving knife 36 and the work piece is thus skived to the form determined by the matrix.

In Fig. 2 is shown a work piece W' in the act of entering the depression 22. The machine as described up to this point is substantially the same in construction, arrangement and mode of operation of its various parts as the machine described in U. S. Letters Patent No. 969,987, granted September 13, 1910, upon the application of J. R. Scott.

For the purpose of assisting the matrix roll 20 in feeding the work piece, there is provided a plurality of toothed disks 38 (Fig. 2) which are mounted upon a sleeve 40 secured upon a shaft 42. The shaft 42 is journaled in the upper portion of the frame 10 and is driven by suitable gearing from the shaft 18. For pressing the work piece down into the matrix depressions there are provided a plurality of spring fingers 48 (Fig. 2). The toothed disks 38 are spaced from each other, and the fingers 48 extend into the spaces between the disks. The construction of the present machine, so far as the toothed disks 38 and the spring fingers 48 are concerned, is similar to that of the machine disclosed in U. S. Letters Patent No. 1,173,359, granted February 29, 1916, upon the application of E. E. Lane.

The work pieces are fed from the magazine 30 by a mechanism which will not be illustrated or described here in detail, inasmuch as this mechanism is fully disclosed in U. S. Letters Patent No. 1,260,553, granted March 26, 1918, upon the application of E. E. Lane. This mechanism consists substantially of a feed slide 49 carrying a thin member (not shown) which engages the lowermost work piece of the stack and advances it to the matrix. This feed slide is reciprocated by a lever 50 which in turn is reciprocated by a lever 53 driven by a cam (not shown) on the main drive shaft 12. The lever 50 is provided with a slot whereby it enters into driving engagement with a pin 52 secured upon the feed slide. A link 54 serves to raise and lower the lever 50 to effect engagement and disengagement respectively of the feed slide through the driving mechanism. Such raising and lowering of the lever 50 is controlled through a treadle 56 subject, however, to a mechanism indicated generally by the reference character 58 which serves automatically to insure that the driving connection of the feed slide be made at such times and under such conditions as to insure proper registration of the work piece W' with the matrix roll 20. As above stated, this mechanism is fully disclosed in Letters Patent No. 1,260,553 and no further description of it need be made here. The machine as so far described operates only to skive the work pieces.

In order to provide for buffing work pieces, there is provided a buffing roll 60 having a sheet of emery cloth 62 secured upon its periphery. The buffing roll 60 is mounted upon a shaft 64 which is journaled in a pair of bearings 66 formed upon the ends of a yoke 68. The yoke 68 constitutes one arm of a bell crank which is fulcrumed upon a pin 70 carried in the upper end of a lever 71. Integral with the yoke 68 and constituting the other arm of the bell crank is a lever 72. Threaded into the lower end of the lever 72 is a pin 74 having a knob 76 formed upon its outer end. Between the threaded end portion and the knob 76 the pin 74 is reduced in diameter and left unthreaded. This unthreaded portion of the pin 74 passes through a cylindrical block 78, the pin 74 being freely rotatable relatively to the block 78 but the block 78 being held between the enlarged threaded end portion and the knob 76 to prevent relative longitudinal movement of the block 78. Extending axially from each end of the block 78 is a pin 80. The pins 80 engage a pair of slots 82 respectively which are formed in a pair of lugs 84 formed on the upper portion of the lever 71. It is evident that turning of the knob 76 in one direction or the other will move the lever 72 toward the right or left, as shown in Fig. 1, thereby rotating the bell crank comprising the yoke 68 and the lever 72 about the pin 70 and raising or lowering the buffing roll 60 to effect the desired adjustment of the buffing roll toward or from the matrix roll 20. A clamping bolt 86 extending through the lugs 84 passes through an arcuate slot 88 formed in the lever 72 and, when tightened, serves to clamp the lever 72 in its adjusted position. The lower end of the lever 71 is fulcrumed upon a pin secured in the lower portion of the frame 10 and coaxial with a shaft 108 shown in Fig. 1. Formed in the lever 71 is a slot 94 through which passes a bolt 96 which is threaded into the frame 10. Between the head of the bolt 96 and the lever 71 is an elongated washer 98 which, when turned crosswise to the slot 94, serves to hold the lever 71 in its operating position. When it is desired to replace an abrasive cover upon the buffing roll, the washer 98 is turned to an angle of 90 degrees enabling it to slip through the slot 94. The lever 71 may then be swung outwardly to render the buffing roll accessible. A suitable opening formed in the upper portion of the rear wall of the frame 10 enables the buffing roll to pass to and from its operating position. The buffing roll 60 is driven by a belt 102 passing around a pulley 104 mounted upon the shaft 64 and also around a pulley 106 secured upon the shaft 108 which is journaled in the lower portion of the frame 10. The outer end of the shaft 108 carries a pulley 110 around which passes a belt 112 which is driven by a pulley secured upon the main shaft 12. The shaft 108, as above indicated, is substantially concentric with the fulcrum of the lever 71, so that movement of the lever 71 toward and from its operating position will not affect the tension of the belt 102.

In order to retain a work piece within one of the matrix depressions 22 or 24 after the work piece has passed the skiving knife 36, there are provided three rolls 116, 118 and 120 respectively. These rolls are mounted in substantially tangential relation to the undepressed portion of the periphery of the matrix roll 20. Secured to each end portion of the knife support 34 is a bearing block 122 within which the ends of the rolls 116, 118 and 120 rotate. These end portions 124 are reduced in diameter, as indicated in Figs. 2 and 3. Secured upon each of the rolls 116, 118 and 120 are gears 126. Each of the gears 126 meshes with a gear 128 carried upon the matrix roll shaft 18 so that the three rolls 116, 118 and 120, rotating in a direction opposite to that of the matrix roll, will assist the latter in feeding the work piece while holding the work piece positively in the matrix depression. The peripheral speed of the rolls 116, 118 and 120 is substantially equal to that of the matrix roll 20. A sheet metal guard 130 (Figs. 2 and 3) is curved about the matrix roll 20 and extends from the lower surface of the knife 36 almost to the periphery of the abrading roll 60. This guard is secured to the bearing blocks 122 by screws 132. The guard 130 is slotted to provide clearance for each of the rolls 116, 118 and 120. The guard 130 serves to prevent the leading end of the work piece from springing

out of the matrix depression and guides the leading end into engagement with the three feed rolls.

In order to prevent the work piece from adhering to the abrading roll 60 and to keep it in the matrix depression, there is provided a stripper plate 134 having a beveled edge positioned close to the locality of tangency between the matrix and abrading rolls. The stripper plate 134 is secured by screws 136 to a cross piece 138 having a flange 139 (Fig. 4) at each end, the flanges of the cross piece 138 being secured by screws 140 to a pair of lugs 142 which extend from the frame 10. The screws 140 serve also to secure a pair of bearing blocks 144 to the flanged ends of the cross piece 138. Journaled within the blocks 144 is a roll 146 which is substantially tangential to the undepressed portion of the matrix roll 20. Secured upon the roll 146 is a gear 148 which meshes with the gear 128, thereby driving the roll 146 in a direction opposite to that of the matrix roll and causing the roll 146 to assist in the feed of the work piece. The directions of rotation of all of the various rolls respectively are indicated by arrows on Fig. 2. Depending from the cross piece 138 and curved about the forward lower portion of the abrading roll 60 is a sheet metal guard 150 which protects the operator from contact with the abrading roll. The lower end of the guard 150 is supported by a rod 152 extending between the side walls of the frame 10. A downwardly inclined web 154 serves as a delivery chute for the work pieces as they leave the roll 146 and the matrix roll 20.

In the operation of the machine, the work pieces W are fed by the automatic mechanism from the stack within the magazine 30 being advanced in timed relation to the matrix roll 20 so that each work piece registers with a depression on the matrix roll. The work pieces are first carried past the knife 36 which skives them to a form determined by the depressions in the matrix roll. As the matrix roll continues to rotate, the work pieces are retained within the depressions by the rolls 116, 118 and 120, which rolls also assist in the feed of the work piece. Continued rotation of the matrix roll brings the work piece into engagement with the buffing roll which finishes the entire exposed surface of the work piece. After passing the buffing roll, the work piece continues past the beveled edge of the stripper 136 and past the roll 146 whereupon it drops out of the depression in the matrix roll into the chute 154 from which it may fall into a receptacle.

Having described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A method of making shoe parts and the like which consists in pressing a work piece into a matrix, skiving the work piece to a form determined by the matrix, and buffing the exposed surface of the work piece while the work piece is still in the matrix.

2. A method of making shoe parts and the like which consists in pressing a work piece into a matrix, moving the matrix past a skiving tool to cause the work piece to be skived to a form determined by the matrix, and in further moving the matrix with the work piece pressed therein past a buffing tool to cause the exposed surface of the work piece to be buffed.

3. A machine for operating upon shoe parts and like articles comprising a feed member, a skiving tool for operating upon a work piece as the work piece is advanced by said feed member, and a buffing tool constructed and arranged to operate upon the skived surface of the work piece during the continued advance of the work piece by said feed member.

4. A machine for operating upon shoe parts and like articles comprising a feed roll, a relatively stationary skiving knife positioned to operate upon a work piece which is being advanced by said feed roll, a buffing roll constructed and arranged to operate upon the skived surface of the work piece during the continued advance of the work piece by said feed roll, and means for holding the work piece against said feed roll.

5. A machine for operating upon shoe parts and like articles, comprising a cutting tool, a buffing tool, a matrix, and means for causing operative engagement first between a work piece in said matrix and said cutting tool and then between the work piece and said buffing tool.

6. A machine for operating upon shoe parts and like articles, comprising a knife, a buffing tool, a matrix, and means for moving said matrix to cause a work piece in the matrix to come into operative engagement first with said knife and then with said buffing tool.

7. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, and a driven matrix roll constructed and arranged to present a work piece first to said skiving tool and then to said buffing tool.

8. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a matrix, means for causing operative engagement first between a work piece in said matrix and said skiving tool and then between the work piece and said buffing tool, and means for retaining the work piece in the matrix between said skiving and buffing operations.

9. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven matrix roll constructed and arranged to present a work piece first to said skiving tool and then to said buffing tool, and means positioned between said skiving tool and said buffing tool for retaining the work piece in the matrix.

10. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, said buffing tool being driven in a direction to oppose the feed of the work piece, and driven means engageable with the exposed surface of the work piece in said matrix depression for assisting the matrix roll in feeding the work piece past said buffing roll.

11. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, said buffing tool being driven in a direction to oppose the feed of the work piece, and driven means engageable with the work piece between said skiving tool and said buffing tool for assisting the matrix roll in feeding the work piece past said buffing tool and for retaining the work piece in said matrix depression.

12. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, and a plurality of

rolls substantially tangential to the undepressed portion of said matrix roll for retaining the work piece in said matrix depression between said skiving tool and said buffing tool.

13. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, a plurality of rolls substantially tangential to the undepressed portion of said matrix roll for retaining the work piece in said matrix depression between said skiving tool and said buffing tool, and means for driving said retaining rolls to assist said matrix roll in feeding the work piece.

14. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, and a guide member close to said matrix roll and having a work guiding surface curved about said matrix roll between said skiving tool and said buffing tool to retain the work piece in said matrix depression.

15. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, a plurality of rolls substantially tangential to the undepressed portion of said matrix roll for retaining the work piece in said matrix depression between said skiving tool and said buffing tool, and a guide member close to said matrix roll for assisting said retaining rolls in retaining the work piece in the matrix depression, said guide member having a work guiding surface which is curved about said matrix roll between said skiving tool and said buffing tool and which is recessed to accommodate said retaining rolls.

16. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a matrix, means for causing operative engagement first between a work piece in said matrix and then between the work piece and said buffing tool, and means for preventing the work piece from adhering to said buffing tool.

17. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, and means engageable with the leading end of the work piece as the work piece passes said buffing tool to strip the work piece from the buffing tool.

18. A machine for operating upon shoe parts and like articles, comprising a skiving tool, a buffing tool, a driven roll having a matrix depression and constructed and arranged to present a work piece in said depression first to said skiving tool and then to said buffing tool, said buffing tool being driven in a direction to oppose the feed of the work piece, and a feed roll positioned beyond said buffing tool and engageable with the exposed surface of the work piece in the matrix depression, said feed roll being driven in a direction to assist the matrix roll in feeding the work piece past the buffing tool.

19. A machine for operating upon shoe parts and like articles, comprising a rotary buffing tool, a driven roll constructed and arranged to present a work piece to said buffing tool, a carrier for said buffing tool, a pivoted support for said carrier to enable said buffing tool to be moved away from said roll when it is desired to replace the abrasive element of said buffing tool, a driven shaft substantially coaxial with said pivotal support, and a driving connection between said driven shaft and said buffing tool.

20. A machine for operating upon shoe parts and like articles, comprising a driven rotary buffing tool, means for presenting a work piece to said buffing tool, a carrier for said buffing tool, means for supporting said carrier for movement of said buffing tool from an operating position relatively close to said work presenting means to a position relatively remote from said work presenting means when it is desired to replace the abrasive element of said buffing tool, and a support for said buffing tool adjustably secured upon said carrier to enable the buffing roll, when in operating position, to be adjusted toward and from said work presenting means.

21. A machine for operating upon shoe parts and like articles, comprising a driven rotary buffing tool, means for presenting a work piece to said buffing tool, a carrier for said buffing tool, a pivotal support for said carrier to enable said buffing tool to be moved from an operating position relatively close to said work presenting means to a position relatively remote from said work presenting means when it is desired to replace the abrasive element of said buffing tool, a support for said buffing tool pivotally mounted upon said carrier, and means for adjusting said buffing roll support relatively to said carrier to vary the distance between said buffing tool and said work presenting means when the carrier is in operating position.

RENÉ E. DUPLESSIS.