

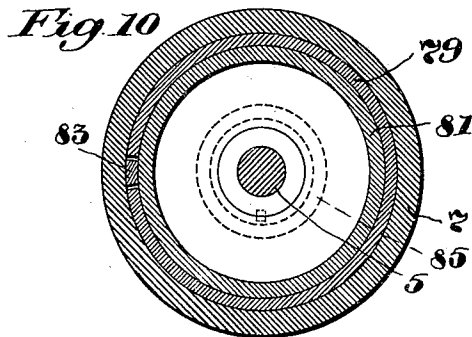
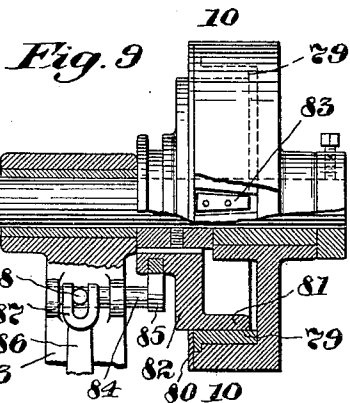
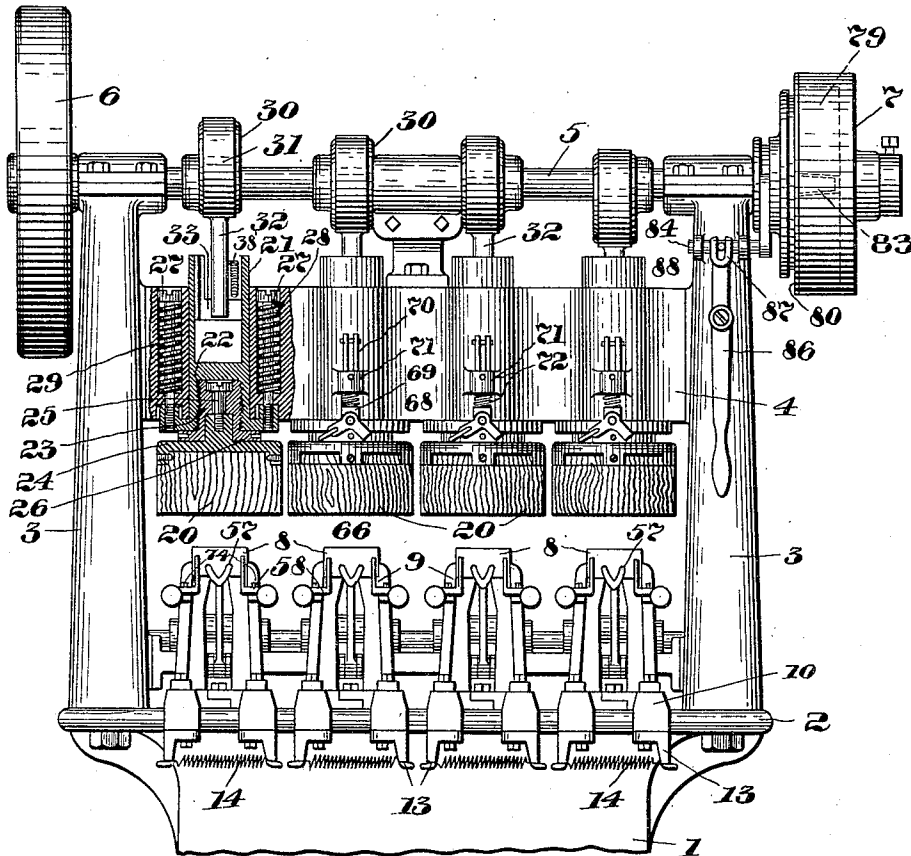
M. D. PHELAN.
AUTOMATIC HEEL SEAT ROUGH ROUNDNER.
APPLICATION FILED JUNE 1, 1906.

1,005,573.

Patented Oct. 10, 1911.

5 SHEETS—SHEET 1.

Fig. 1



Witnesses:
Horace H. Crossman.
Adolph C. Kaiser.

Inventor:
Merton D. Phelan
by Emory Booth,
Attys

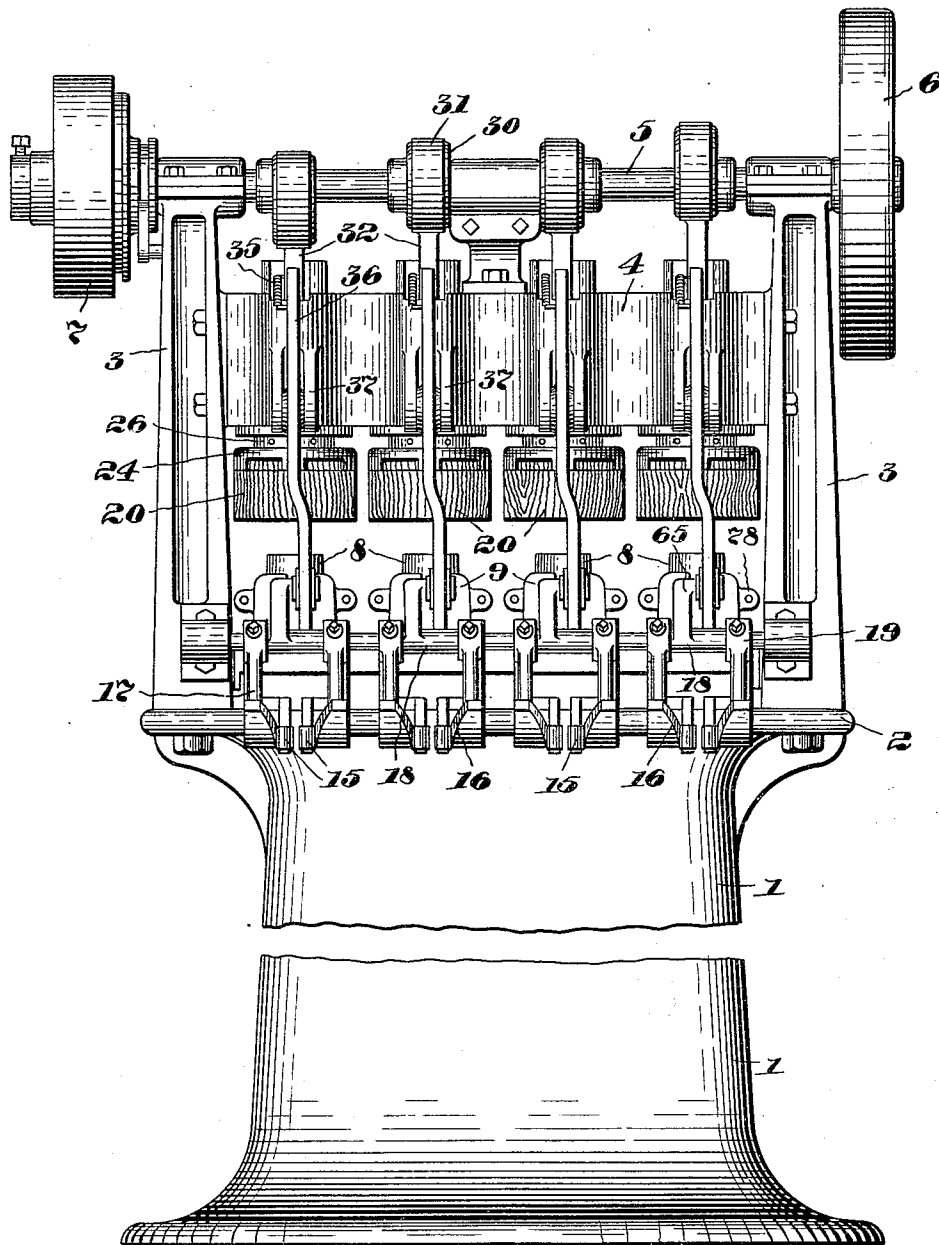
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6 SHEETS—SHEET 2.

Fig. 2



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6 SHEETS—SHEET 3.

Fig. 4

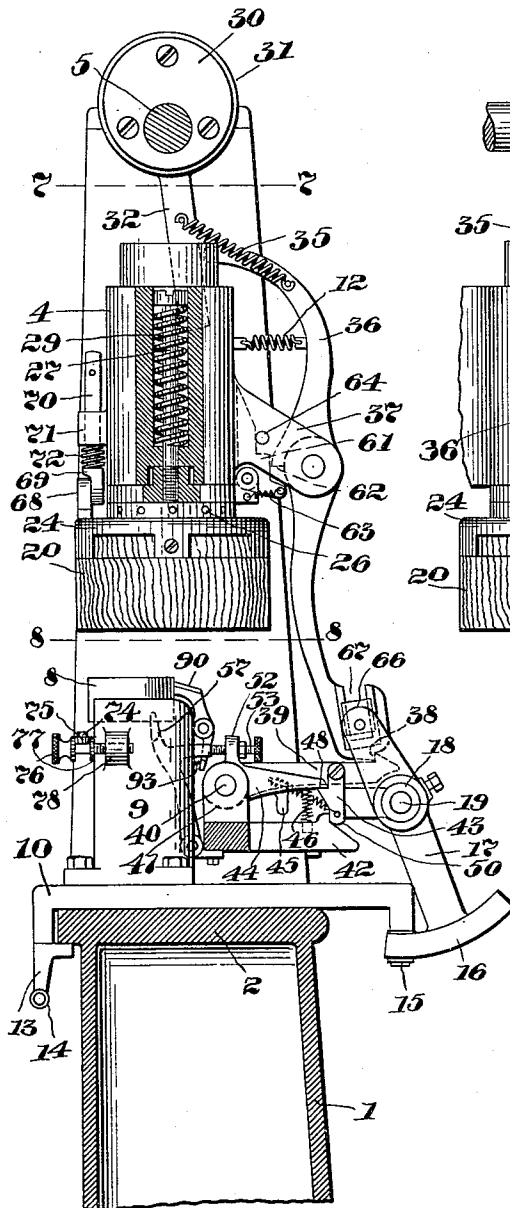
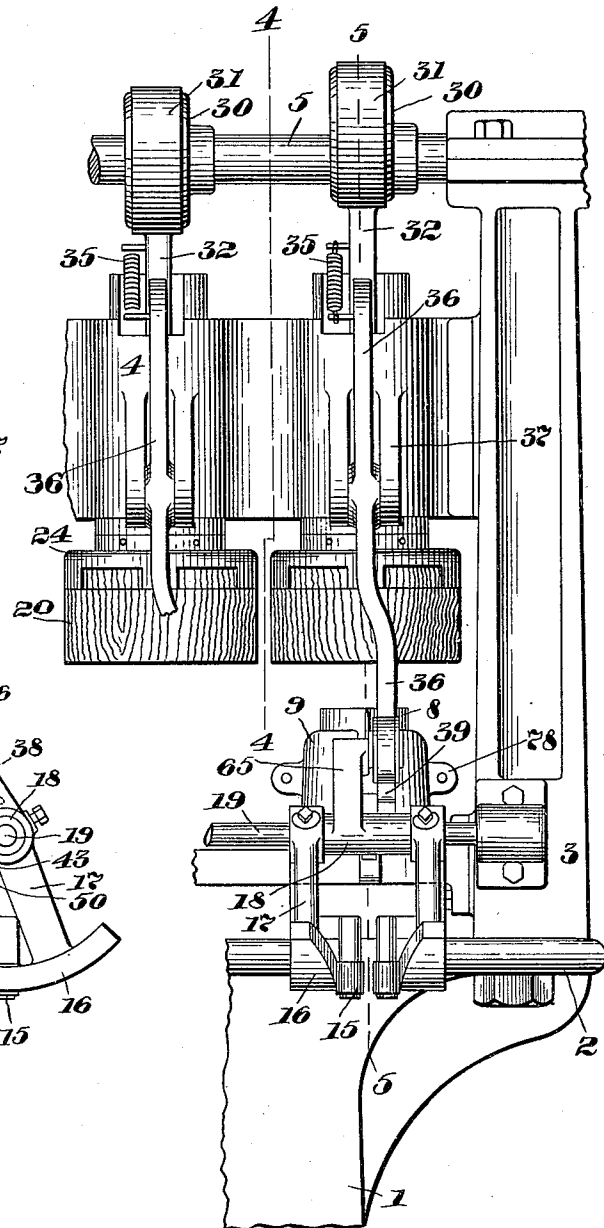


Fig. 3



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6 SHEETS—SHEET 4.

Fig. 5

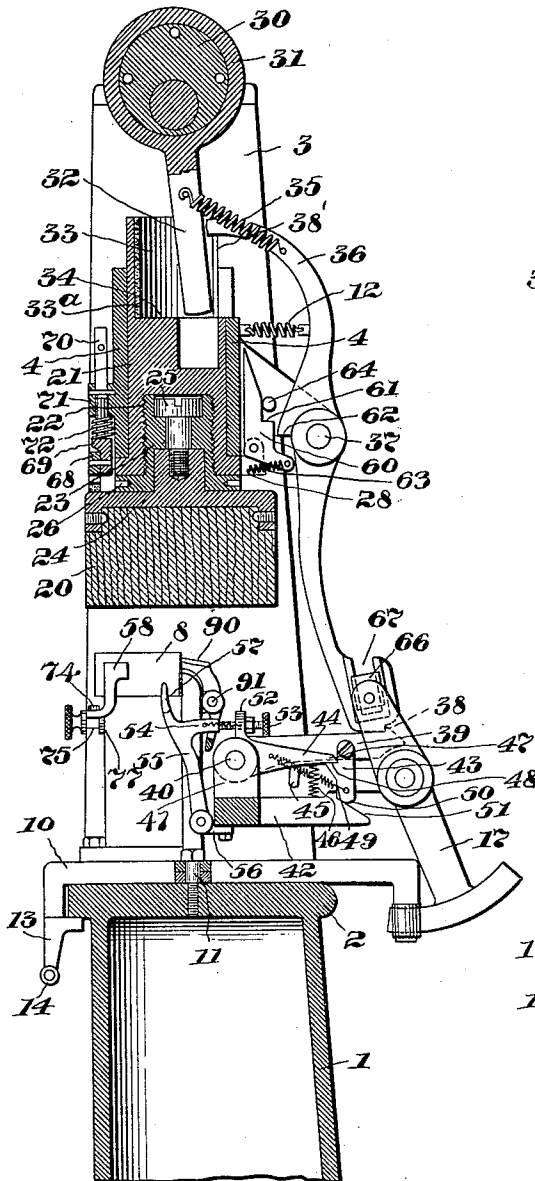
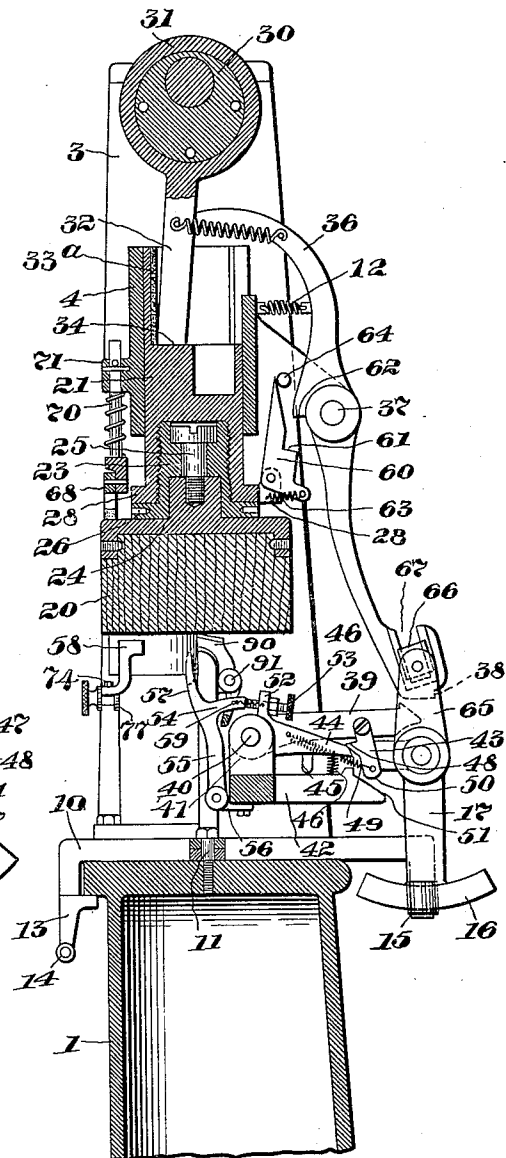


Fig. 6



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6 SHEETS—SHEET 5.

Fig. 7

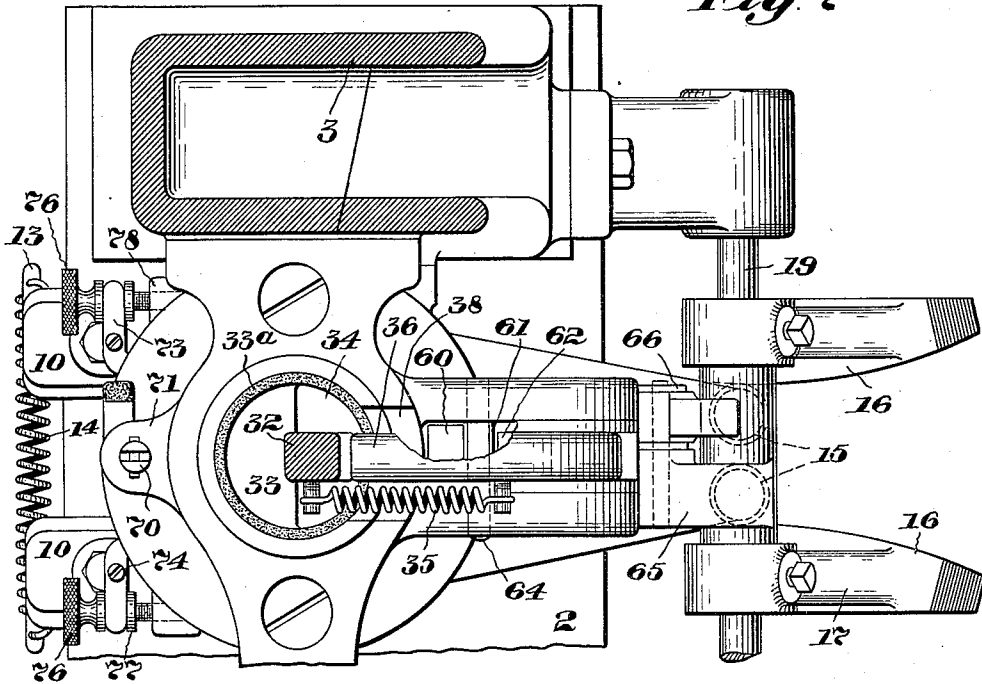
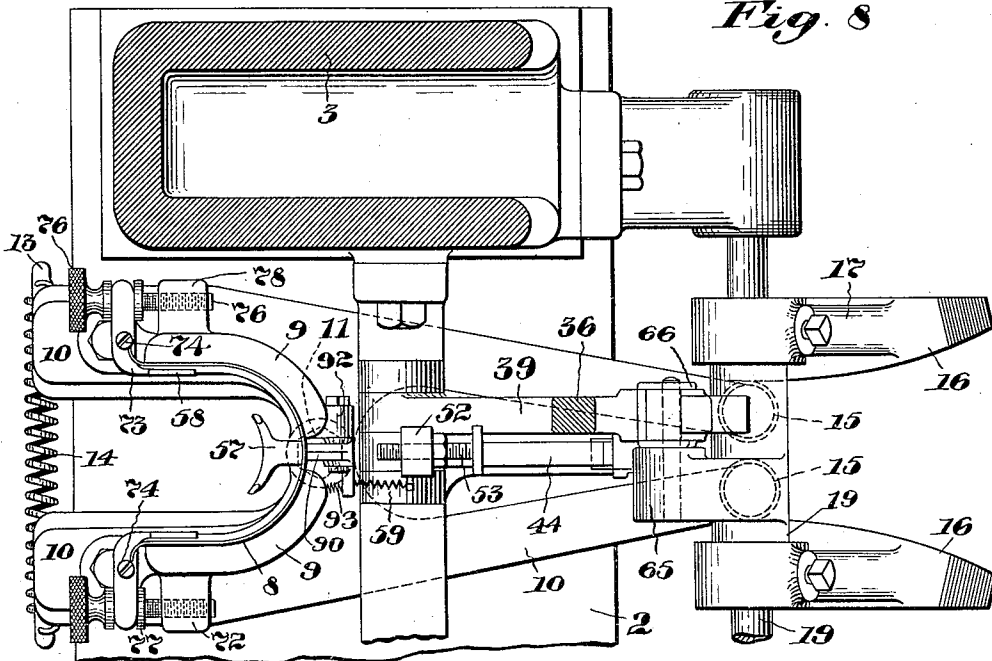


Fig. 8



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UNITED STATES PATENT OFFICE.

MERTON D. PHELAN, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

AUTOMATIC HEEL-SEAT ROUGH-ROUNDER.

1,005,573.

Specification of Letters Patent.

Patented Oct. 10, 1911.

Application filed June 1, 1906. Serial No. 319,709.

To all whom it may concern:

Be it known that I, MERTON D. PHELAN, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented an Improvement in Automatic Heel-Seat Rough-Rounders, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to machines for rough rounding or dying out the ends of shoe soles; more particularly to a machine for removing marginal material from the heel seats of soles which are already attached to the shoe. In machines of this type as hitherto constructed the cutting or rounding mechanism has been set in operation by a treadle, shipper lever or equivalent, necessitating more or less attention on the part of the operative.

One of the features of my invention is the provision of means by which the cutting or dying out mechanism is set in operation by the presentation of the work to it and is automatically stopped to permit the removal of the work at the completion of the cutting operation.

My invention also contemplates conforming the knife employed for cutting to the contour of the shoe counter prior to its cutting operation rather than during the cutting motion, thereby avoiding relative motion between them during said operation.

These and other features of my invention, however, will be best understood and appreciated from the following description of one embodiment thereof selected for purposes of illustration and shown in the accompanying drawings, its scope being more particularly pointed out in the appended claims.

Referring to the drawings;—Figure 1 is a front elevation of the head of a machine typifying one embodiment of my invention, and selected for purposes of illustration, the base of the column being shown as broken away; Fig. 2, a rear elevation thereof the supporting column being shown as broken; Fig. 3, an enlarged elevation of the right end thereof, with parts broken away; Fig. 4, a vertical section taken on the line 4—4, Fig. 3; Figs. 5 and 6 are similar views taken on the line 5—5 Fig. 3, the latter, however,

showing the cutting block depressed into cutting relation with the knife. Figs. 7 and 8 are enlarged horizontal sections respectively taken on the lines 7—7 and 8—8, Fig. 4; and Figs. 9 and 10 respectively represent enlarged longitudinal and transverse vertical sections taken through the clutch operating mechanism, Fig. 1, the latter section being taken on the line 10—10, Fig. 9.

In the embodiment of my invention herein illustrated, (see Fig. 1) the machine is provided with a column, 1, having a head, 2, upon which the vertical standards or side frames, 3, are secured. Adjacent their upper ends these frames are provided with a stationary cross head, 4, and above said cross head, 4, with suitable bearings for a horizontal drive shaft, 5. This drive shaft is provided at its left end with a balance wheel, 6 (Fig. 1), and at its opposite end with a loose pulley, 7, adapted to be constantly rotated by a usual belted connection with any convenient source of power.

While any desired number of rough rounding or dying out mechanisms may be employed, I have provided, in the present instance, a series or gang of four, each comprising the curved flexible knife, 8 (Fig. 1), movably arranged upon said head, 2. These knives being similar in construction a description of one will suffice.

The knife, 8 (Figs. 1, 4 and 8) is supported by and at the upper ends of a pair of suitable segmental shaped carriers or flanges, 9 (Figs. 4 and 8) rising respectively from horizontal levers, 10. These levers are pivoted intermediate their ends upon a vertical pivot, 11 (Figs. 5 and 8), secured to said head, 2, permitting said carriers to open and close like a hinge. The segmental shape of these carriers presents between them a U or heel shaped recess, (Fig. 8), adapted to receive the end of a shoe, more particularly the counter of an inverted shoe with the attached sole edge overlying and upon the top or cutting edge of the knife. This knife as shown is curved to correspond approximately to the shape of the recess and its front ends are curved outwardly as best shown in Fig. 8, so that when operated to cut away the marginal material from the heel seat of a shoe sole, the ends of the cut will swing abruptly outward to the edge of the sole leaving sufficient margin at the ends

of said knife and along the shank of the sole for trimming in the usual manner. To draw the ends of the knife normally toward each other and reduce the inclosed opening, the front ends of knife supporting levers, 10, are provided with depending lugs or fingers, 13 (Figs. 1, 4 and 8), which are connected by a coil spring, 14, which acts to close or contract the side of the knife against the sides of the counter and to shape said knife in conformity to the shape of said counter. To limit the spring actuated closing of the knife, the rearwardly extending arms of said levers, 10 (see Fig. 4), are provided with depending vertical rollers, 15 (Figs. 3 to 8), which stand between and are constantly engaged by the carrier spreading or cam surface of the segmental head, 16, formed upon or connected with the lower ends of vertical arms, 17. Each of these arms is adjustably mounted upon a sleeve, 18 (Figs. 2, 3 and 4), the latter in turn being rotatably mounted to swing upon a horizontal shaft, 19, suitably supported at its ends by said side frames or standards, 3. As said sleeve, 18, is oscillated to swing the cam heads, 16, inward from the position shown in Fig. 5 to that shown in Fig. 6, said cams (see Figs. 7 and 8) will permit the roller supporting arms to spread under the action of the spring, 14, to contract the heel shaped recess upon the counter of an inserted shoe and closing the knife, 8, to adapt it to cut a heel seat of corresponding size and shape. If the cams are swung in an opposite direction, their action upon the carrier rollers, 15, will cause them to approach one another thereby to separate the front ends of the levers, 10, against the action of the spring, 14, opening the heel shaped recess to permit the shoe counter to be removed and another inserted therein. By adjustment of the arms, 17, upon the rock shaft, 18, the amount of opening or the contraction between the sides of the carriers and the knife thereon may be varied within wide limits so that any size of shoe counter may be received, the flexibility of the knife under the action of the spring, 14, permitting it to conform to the particular size and shape of counter inserted. Coöperating with each of said knives, 8, to cause its edges to cut through the sole overlying it, is a vertical reciprocatory presser block, 20 (see Fig. 1 and 5). This block, 20, depends from a tubular stem or plunger, 21, which is mounted to slide vertically in said cross head, 4, the latter being bored out to provide vertical cylindrical recess bearings therefor. The several blocks and their connecting mechanisms being alike the description of one is sufficient. For adjustably securing said block, 20, to its plunger, 21, the lower end of the latter is provided with a central threaded recess, 22 (Figs. 1 and 5), to receive a threaded shank, 23 (Figs. 1 and 5), which is provided at its lower end with an apertured head to receive the stem of a block or holding screw, 25, which permits the block, 20, to rotate freely at all times. The circular flanged head of the threaded shank, 23 (Figs. 1, 4 and 5), is also provided with a series of peripheral openings, 26, adapted to receive a pin or other pointed instrument by which it may be rotated to adjust its shank and the block carried thereby vertically relative to its plunger, to compensate for the wear of the cutting face of the block. That the plunger and presser block carried thereby may be normally held elevated, preferably by said cross head, 4 (Figs. 1 and 4), the latter is provided at opposite sides of each plunger with cylindrical recesses that receive the screw bolts, 27, extending through openings in the bottom of their recesses and tapped into a horizontal flange, 28, upon said plunger, 21. Each of these bolts is surrounded by a coil spring, 29, interposed between its head and the bottom of its recess, the latter constituting a stationary seat therefor, so that the action of said springs is normally to elevate said bolts, the plunger and the block carried thereby. For depressing each of said plungers and its presser block in said cross head, an eccentric, 30, is mounted upon said drive shaft, 5, directly over the plunger. The several eccentrics are set on the quarter on said drive shaft, 5, so as to balance the same and equalize the stress thereon. The eccentric strap, 31 (see Figs. 1, 5, and 6), is provided with a depending rod, 32, arranged normally to reciprocate in a central cylindrical opening or recess, 33, in the head of said plunger. Immediately in front of and above the bottom of said recess, 33, is a ledge, 34, constituting a seat for the lower end of the eccentric rod, 32, when the latter is swung forward into engagement therewith. So long as the eccentric rod is held to the rear as shown in Fig. 5, its reciprocations will impart no motion whatsoever to the plunger in which it reciprocates. When, however, in its elevated position said rod is deflected to the left or forward, it will upon its next descent, strike the seat, 34, and depress with it the plunger and its cutting block to cause the latter to die out a sole in the knife beneath. The interior of the recess or opening 33, is provided with a lining 33^a of leather or any other convenient material, for successfully resisting wear of the metallic parts. The rod, 32, is normally held in a rear position at one side of said seat, 34 (see Fig. 5), by means of a coil spring, 35, connecting said arm with a normally stationary vertically arranged lever, 36. This lever is pivoted intermediate its ends at 37 between rearwardly extending ears, on said cross head, 4, and is adapted to be oscillated to move

with it, said eccentric rod, 32, to cause the reciprocations of said cutting block as described. The curved upper end of this lever stands directly behind and is normally retained in engagement with the eccentric rod by the coil spring, 35, referred to and which is attached thereto, the head of said plunger having a vertical slot, 38', to permit said lever arm to oscillate therein.

To draw the upper arm of the lever, 36, normally forward, a coil spring, 12 (Fig. 4), connects said arm with a cross head, 4, said spring being stretched or under tension while said lever, 36, is in its rear position. The forward movement, however, is normally prevented by providing the lower end of said lever, 36, at its under side with a lug, 38 (Figs. 4 to 6), which is engaged by a hook or projection at the adjacent end of a horizontal latch lever or dog, 39, pivotally mounted at 40, between upwardly extending ears, 41, of a horizontal cross plate, 42, said plate being secured at its ends to said standards, 3. If the latch or dog, 39, be depressed, the lever, 36, is released to be actuated by its spring, 12, to throw the eccentric rod, 32, forward over the ledge, 34, to reciprocate the cutting block, 20.

I will now describe the mechanism for depressing the latch, 39, to permit appropriate movement to said lever, 36, to actuate the cutting or presser block at desired time and to retract said lever to its rear or normal position. This mechanism (see Figs. 4 and 6), comprises the latch lever, 39, to which reference has been made and from which depends a vertical swinging cam lever, 43, provided at its front edge with a cam lug, 48. Normally overlying this cam lug is the cam end, 47, of a horizontal actuating or releasing lever, 44, pivotally mounted with the latch, 39, at 40 (Fig. 4). Intermediate its ends this lever is provided with a depending lug or stop, 45, to limit the downward swing of said lever, a coil spring, 46, interposed between the rear end of said lever and said cross plate, 42, normally retaining it in elevated or horizontal position. That the releasing lever, 44, and its connected latch, 39, may be actuated automatically by the insertion of a shoe in the U-shaped recess to cause the rounding mechanism to operate, I have, in the present instance, provided a vertical lever, 55, which at its lower end is pivotally mounted at 56 between ears of a bracket secured to said cross plate, 42. The upper end of said lever stands back of the U or heel-shaped recess presented between the sides of the carriers, 9, and knife, 8, being forked at 57, in position to be engaged and moved rearward by and upon insertion of a shoe in the knife opening. The back of this lever, 55, has a lug, 54, to engage a horizontal adjusting screw, 53, or mounted in a vertical lug or arm, 52, of the releasing

lever, 44. By this arrangement the rearward movement of the lever, 55, depresses the lever, 44, and the cam lever, 43, to depress the latch lever, 39, away from the lower end of the upright lever 36, permitting the latter to spring forward at its upper end and move the eccentric rod to cause depression of its cutting block and die out the sole of a shoe inserted on said knife. This lever, 55, thus governs the releasing lever and consequently the rounding mechanism and constitutes a releasing device therefor. By means of the adjusting screw 53, the forked end, 57, of said lever may be moved toward and from the back of the knife so that any desired amount of marginal material may be removed from the projecting edge of a shoe sole by the cutting action of said knife, thus also acting as a rear gage for positioning the shoe relative to the back of the knife. As herein shown this rear gage or its lever, 55, is yieldingly secured to the releasing lever, 44, by means of a coil spring, 59, connecting said lug or stop, 54, and said lug, 52. This construction permits the rounding mechanism to be released or actuated by the movement of the rear gage in positioning a shoe, and is therefore under the control of the operative, the machine acting automatically upon the presentation of the shoe or counter, the eccentric arm, 32, being swung forward to depress the cutting block after the shoe has been positioned in the recess presented by the knife and its carriers and not during the relative movement of said knife and its cutting block.

The rearward movement of the lever, 36, or its return to normal position and which is utilized to catch and again lock with the latch lever, 39, to hold the eccentric rod in its rear or inoperative position is provided as follows:—As said cam lever, 43, is depressed (Figs. 5 and 6), the beveled edge, 51, of the plate, 42, operates as a cam to deflect rearwardly the rounded end, 50, of the cam lever, 43, to disengage its lug, 48, from the end of said releasing lever 44, to free said cam lever. When thus released the cam lever is drawn to the front by its spring, 49, and its lug riding upward on the cam end, 48, of its lever, 44, causes said cam lever to be raised and with it the latch lever, 39, to which it is connected, to place said latch lever in readiness to catch the lugged end of the upright lever, 36, when the latter returns to its forward position, said latch lever, 39, is thus placed in a position to catch the upright lever, 36, when the upper arm of the latter is swung rearward by return or upward movement of the plunger, 21. To cause said lever, 36, to be so returned to its normal position for locking its lower end in engagement with said lever, 39, I have, in the present instance, provided a

tripping device which is interposed between the back of said cross head, 4, and said lever, 36. This tripping device (see Figs. 5 and 6), comprises a bell crank, 60, tapered at its upper end and provided with a shoulder, 61, the horizontal face of which constitutes a lifter lug to engage a lug, 62, formed at the front of the upper arm of said lever, 36. This bell crank is pivoted between ears formed on said plunger flange, 28, and moves therewith, a coil spring, 63, connecting its short arm with said flange normally tending to depress said arm and swing the tapered end of said bell crank rearwardly, said movement being resisted by a stop pin, 64 in the cross head. By reference to Fig. 6, it will be apparent that, as the presser block and plunger are depressed, the tapered upper end of the bell crank will be drawn down below said pin which permits its spring, 63, to swing said bell crank to the rear to cause the lifter lug, 61, to swing beneath the co-operating lug, 62, on the lever, 36. Upon the return or upward movement, the plunger, taking with it the bell crank, said lifter lug will catch the lever lug and swing the upper end of said lever rearward to draw the eccentric rod, 32, also rearward to prevent a second depression of the plunger. By the continued upward movement of said bell crank its tapered end passes in front of said pin, 64, to disengage the lifter lug, 61, from the lever lug, 62, but not until said lever, 36, has been caught and held at its lower end by the latch lever, 39, described. This leaves the plunger and presser block in the elevated position to which they were drawn by their retracting springs, 29. This bell crank therefore constitutes a tripping device for said lever, 36, and connected eccentric arm, 32, and which operates to cause the latter to be swung into its rear or what may be termed its inoperative position since it is reciprocated within the head of the plunger without actuating the same.

To permit the knife to close upon the counter of the shoe before the actual cutting takes place, the sleeve, 18, from which the segmental heads, 16, depend is provided with an upwardly extending arm, 65 (see Figs. 2 to 8), having at its upper end a pivoted block, 66 (Fig. 4), slidably mounted in rectangular ways or a recess, 67, in the lower end of said lever, 36. As said lever is released by the insertion of a shoe or the presentation of the work to the action of the cutting mechanism, and its upper arm is swung forward by the action of its operating spring, 12, its lower arm is swung rearward causing the said cam head to swing forwardly, the greater separation of their acting faces, the inclined cam surfaces, freeing said rollers, 15, and permitting them and the rearwardly extended arms upon which they are mounted to separate as the

front ends of said levers are drawn together under the action of their operating spring, 14. By this arrangement the knife is closed upon and shaped to the contour of the shoe end or counter of the inserted and inverted shoe and this takes place not during the cutting movement but previous thereto.

To provide suitable means for preventing the knife from always cutting upon the same portion of the presser or cutting block, (see Figs. 1, 4 and 5), the front of said cross head, 4, to which it is attached is provided with an oscillatory friction lever or pawl, 68, formed as a bell crank and pivotally mounted by its elbow upon a vertical spindle, 69, provided with vertical guide arms, 70, which are slidably mounted in a lug, 71, upon said cross head. This lever by its guide arms has a limited vertical movement relative to said lug, 71, so that the pawl is prevented from following the plunger and its block to the end of its vertical descent. The arms of said bell crank, 68, are of unequal weight consequently as the block supporting plate and said bell crank separate during the descent of said block, said bell crank swings upon its pivot to permit the heavier end to be depressed. This end is provided with a frictional means adapted to engage and bear upon the upper face of the block supporting plate, 24, as the latter is elevated by the retracting springs, 29, and as said bell crank is pivoted at a fixed point at one side of its engaging end further upward motion of said plate, 24, rotates the latter and the block carried thereby until the two arms of said bell crank bear equally upon said plate when further rotation is arrested. For normally maintaining suitable frictional engagement between said bell crank and the block supporting plate, a coil spring, 72, is interposed between said lug, 71, and a shoulder formed on said spindle, 69.

Having described the mechanism for releasing and operating the rough rounding or cutting mechanism, I will next describe the side gages, 58 (see Figs. 1, 4 to 6, and 8), for positioning the shoe laterally relative to the flexible knife in order to provide for removing the marginal material from the heel seat at a desired distance from the sides of the shoe counter. These gages are arranged at the inner sides of the knife and at the front end of said heel shaped recess and each, as herein shown, is in the form of a horizontal bell crank, 73 (Fig. 8), pivoted adjacent its elbow to the segmental shaped carriers, 9, by a vertical pivot bolt, 74 (Figs. 4 and 8), the inner end of said lever or the gage proper, 58, lying parallel with the front and sides of the knife and its outer end standing between the head of said screw and a collar, 77, formed thereon, said screws being tapped into lugs or ears, 78, formed

upon the outer sides of the carrier. By turning these screws, their inner or gage ends may be swung in or out as desired to vary the distance from the cutting edge of the knife and thus position the sides of the shoe counter relative thereto, so that any desired amount of marginal material may be cut away from the corresponding edge of the shoe sole or heel seat. By means of the adjusting screw, 53 (Fig. 4), for the rear gage, 57, the rear of the shoe may be similarly positioned as already described, relative to the cutting edge of the knife, these gages together providing adequate means to shape the heel seat in accordance with any desired pattern, or size and shape. In practice, the gages for each pair of knives, for example, those on the right (see Fig. 1) may be adjusted to operate upon rights and lefts and upon the larger sizes of shoes while those on the left may be similarly adjusted for the smaller sizes so that the machine will cut or shape the heel seat for any desired size of shoe.

To prevent the accumulation of the removed marginal pieces or scrap upon the top of the carriers and around the edge of the knife, a scrap knife or cutter is provided. This scrap knife, 90, in the present instance, is pivotally mounted upon a rearwardly projecting ear, 92, of one of the carriers. Said knife, 90, is in the form of a vertically arranged lever, its upper end having a rearwardly inclined cutting edge, the front of which is maintained against the rear of the flexible knife by means of a coil spring, 93, interposed between the lower arm of said lever and the back of the adjacent carrier on which it is seated. By this arrangement the scrap is cut in two upon the depression of the cutting block, 20, and falls away from the flexible or rounding knife, thereby preventing the accumulation of scrap and consequent interference with the operation of the cutting mechanism.

For starting and stopping the drive shaft, a suitable clutch mechanism is provided, comprising in the present instance, (see Figs. 1, 9 and 10), a split band or friction ring, 79, retained within a cylindrical recess in the side of said loosely mounted pulley, 7, by means of an annular face plate, 80. This band is adapted to engage by its outer face the inner walls of said pulley and is supported upon a circular ring flange, 81 (see Figs. 9 and 10), extending outwardly from a collar, 82, splined or otherwise slidably secured upon said drive shaft, 5. At one side, here shown as the front, this collar is provided with a wedge shaped lug, 83 (Fig. 1), its end being received between the inclined ends of said split friction band, but normally out of engagement therewith. When said collar is slid forwardly to the right (Fig. 9) the wedge en-

gages the inclined ends of said band causing the latter to expand and engage with said pulley and to rotate therewith. The collar is actuated by means of a slide bar, 84, (Fig. 9), having a yoke, 85, received into a circumferential groove in said collar, said slide being slidably mounted in the right standard, 3, and slid to and fro by means of a pivoted shipper lever, 86, its forked end, 87, engaging a horizontal pin, 88, extending forwardly from said slide bar, 84, and causing the latter to move with the forked end of said shipper lever. This shipper lever may be swung in either direction causing the slide bar and its connected collar to move therewith to expand or contract the said spring band, 79, as may be desired, said band constituting the clutch member to rotate said drive shaft.

My machine is operated as follows:—The drive shaft, 5, with its several eccentrics and their rods is caused to operate constantly by actuating the clutch member to engage the constantly rotating pulley, 7. The heel or rear gage and the side gages of each of the knives are then adjusted to cause them to position the shoe when inserted in the U-shaped recess so that the knife will leave the required edge of sole projecting from the side of the shoe or to remove the desired amount of marginal material therefrom. The operative then takes a shoe upper having an attached sole and inverts and bottoms the heel portion or counter thereof in the heel shaped recess between the sides of one of the knives and against the rear gage, 57, therein. The endwise movement of the shoe against said gage causes the latter to swing back into its adjusted position relative to the back of the knife, the side gages simultaneously positioning the shoe laterally therein so that the knife when operated will die out or remove the marginal material at the desired distance from the counter. In this position, the marginal portion of the heel seat rests upon and overlies the cutting edge of said knife and the rearward swing of said rear gage, 57, to its adjusted position, releases the eccentric rod controlling lever, 36, from engagement with the hooked end of the latch lever, 39, to permit it to be thrown forward by the coil spring, 12. As the upper arm of said lever, 36, is thrown forward its lower arm will be thrown rearward causing the sleeve shaft, 18, to be oscillated by the engagement of the slide block, 66, with the lower end of said lever. By this movement the arms, 17, are swung forwardly with their inclined cam faces, 16. The lever rollers, 15, are thus permitted to separate, said separation being positively produced by the action of the coil springs, 14, at the front end of the said levers, 10, causing the carriers, 9, and the knife, 8, supported thereon

to contract upon the counter of the shoe whatever may be its size, thus curving or shaping the knife to the contour of said counter. The rotation of said drive shaft, 5, causes one of the eccentrics, 30, by the engagement of the end of its eccentric rod, 32, with the plunger seat, 34, to depress its plunger and the cutting or presser block connected therewith upon the edge of the sole overlying said knife to remove the desired amount of margin. The subsequent upward movement of the eccentric and its arm, 32, permits said plunger and the cutting block carried thereby also to rise through the contraction of their retracting springs, 29. Simultaneously the tripping device, 60, at the rear of the plunger by its stop, 61, trips or swings rearward the upper arm of said lever, 36, swinging the lower arm forward and rocking said sleeve, 18, to cause the cam heads, 16, to swing rearwardly and by their engagement with the lever rollers, 15, positively cause the latter to approach one another, swinging the front ends of said levers outwardly and thus opening the heel shaped recess to permit free withdrawal of the shoe. The instant the shoe is withdrawn from engagement with the rear gage, 57, said gage is swung forward through the extension of the coil spring, 46, acting to lift the cam end of the releasing lever, 44, said cam end, 47, slipping by the said lug, 48, which gives way before it and which returns again under it. Said cam lever, 43, is locked in its elevated position between the cross plate, 42, and said lever, 44, positively holding the lever, 39, in fixed elevated position to hold the notched end of the lever, 36, in its normal or vertical position until it is again released by the presentation of another shoe to the action of the knife. As the presser block, 20, rises, it is partially rotated by the pivoted pawl lever, 68, so that a new surface of the presser block may always be presented to the subsequent cutting action of the knife against it.

I have described the operation of the machine relative to the action of but one of the rough rounding mechanisms, but it is obvious that all of the cutters may be operated at the same time and that from one to four operatives may be employed for placing the shoes in position to actuate each of the respective rounding mechanisms independently.

It will be readily apparent that each knife may be used alone or all simultaneously and that an operative may operate one knife or two as may be desirable, in the latter case grasping an inverted shoe in each hand and inserting the counters thereof in proper position relative to the adjacent rounding knife to operate as described.

It is evident that this machine and each of the rounding mechanisms connected

therewith is entirely automatic in its operation and is actuated by the presentation of the work thereto and, so far as I am aware, I believe that I am the first to invent a machine of this type.

This machine enables heel seats to be died out in the manner described with a greater speed and accuracy than is possible with machines of any other type known to me, and it is obvious that my machine is also useful in dying out from the toe end or fore part of a shoe or for cutting out marginal portions from leather or other material to a shape presented by the edge of the knife and that the knife supporting plates may be given any desired shape or separation to cause the knife supported thereon to present any desired contour. Furthermore, while I have described one embodiment of my invention, particularly adapted for dying out the heel seats of shoes and in which a gang of four dies is used, any number may be employed, my invention not being restricted in these respects, nor to its use in connection with the manufacture of boots and shoes. It will be obvious that my invention is not limited to the specific details or to the arrangement of parts herein shown, for illustrative purposes only, but that the same may be modified and varied within wide limits without departing from the spirit thereof.

What I claim is:—

1. An organized machine of the type described comprising in combination a stationary flexible knife, means for curving said knife to the contour of the boot or shoe counter, a pressure or cutting block movable toward and from said knife, and means acting automatically upon presentation of a shoe to said knife to operate said pressure block for the purpose described.

2. An organized machine of the type described comprising in combination a stationary flexible knife, means for curving said knife to the contour of the boot or shoe counter, a pressure or cutting block movable toward and from said knife, and means acting automatically upon presentation of a shoe to said knife to operate said curved means and pressure block.

3. An organized machine of the type described comprising in combination knife carrying means presenting a heel shaped recess and provided with a flexible knife, a presser block and means governed by the insertion of a shoe in said recess to move said carrying means to curve or shape said knife to the contour of the boot or shoe counter and thereafter to move said knife and block one relative to the other for the purpose described.

4. An organized machine of the type described, comprising in combination a flexible knife, means for curving or shaping the

knife to conform to the boot or shoe counter, a presser block, and means for producing motion between said block and knife, one relative to another, said two means constructed and arranged for automatic operation by the presentation of the boot or shoe to the action of said knife.

5. An organized machine of the type described comprising in combination a flexible knife arranged to present a U shaped recess, a cutting block movable relatively thereto, and means acting automatically by the insertion of work into said recess to close the knife into conformity with the work and then produce relative motion between said knife and block to cut the sole.

6. An organized machine of the type described comprising in combination a stationary flexible curved edge knife arranged to present between its sides a recess adapted to receive one end of the shoe with the margin of the attached sole projecting beyond said knife edge, means for conforming said curved knife edge to the shape of said shoe end, a cutting block movable toward and from the knife, means for moving said block, and means acting automatically upon the insertion of the shoe into said recess to move the knife into operative position and operate said moving means to operate the block.

7. An organized machine of the type described comprising in combination a stationary and flexible curved edge knife arranged to present between its sides a recess adapted to receive one end of a shoe with the margin of the attached sole projecting beyond said knife edge, yielding means for conforming said curved knife edge to the shape of said shoe end, a cutting block, means for moving said knife and block one relatively to the other, and means acting automatically upon the insertion of the shoe into said recess to move the knife into operative position and then operate said moving means to actuate the block.

8. An organized machine of the type described comprising in combination a flexible curved edge knife arranged to present between its sides a recess adapted to receive one end of the shoe with the margin of the attached sole projecting beyond said knife edge, means for conforming said curved knife edge to the shape of said shoe end, a cutting block, means for moving said knife and block one relative to the other, and means acting automatically upon the insertion of the shoe into said recess to first move the knife into operative relation with the work and then operate said moving means, and means for positively separating said knife and block at the conclusion of the cutting movement.

9. An organized machine of the type described comprising in combination a flexible

curved edge knife arranged to present between its sides a recess adapted to receive one end of the shoe with the margin of the attached sole projecting beyond said knife edge, means for conforming said curved knife edge to the shape of said shoe end, a cutting block, means for moving said knife and block one relative to the other and means acting automatically upon the insertion of the shoe into said recess to operate said knife conforming means, and cause relative cutting movement of the block and knife.

10. An organized machine of the type described comprising in combination a dying out knife, a pair of knife supports having a curved periphery forming a recess adapted to receive the upper of the shoe with the edge of its attached sole projecting beyond the edge of said knife, a presser block, and means governed by the insertion of a shoe into said recess to move the knife into conformity with the work and then operate said block and knife supports one relative to the other, said movement being adapted to remove marginal material from the shoe sole.

11. In a rough rounding machine for rounding the end of shoe soles, a stationary curved dying out knife, pivoted knife supports, means acting prior to the cutting movement to move the supports and shape the curve of the knife to different sizes of shoes, and means controlled by the presentation of the work to operate said shaping means.

12. An organized machine of the type described comprising in combination a curved dying out knife presenting a U shaped recess, gages for positioning the shoe within said knife, a pressure or cutting block, and means governed by the presentation of the work to said gages for moving said knife and block one relative to the other to round the end of a shoe.

13. In a machine of the type described, cutting means comprising a curved knife for rounding the ends of shoe soles and pivoted gages extending within the contour of the knife for positioning the work relative thereto, substantially as shown and described.

14. An organized machine of the type described comprising in combination a cutting device, and a gage for positioning the work relative thereto, a cutting block, constantly reciprocating means, and normally inactive means between said block and reciprocating means arranged to produce relative motion between said cutting device and block upon movement of said gage by presentation of the work.

15. An organized machine of the type described comprising in combination a knife, a presser block, operative means governed by the presentation of the work for causing

said knife to conform to the work and then cause movement of said knife and block one toward the other, means for separating them, and means actuated by the last named means for rendering said operative means inoperative until the subsequent presentation of work to the action of the cutting device.

16. An organized machine of the type described comprising in combination a flexible knife arranged to present a U shaped recess between its sides to receive a shoe end with the margin of its attached sole projecting beyond the cutting edge of said knife, a cutting block, means for curving the knife to conform in shape to the shoe end as the latter is placed in said recess, means for moving said knife and block into cutting relation one relative to the other, and means connected with each of said means and governed by the insertion of the shoe in said recess to actuate the same.

17. An organized machine of the type described comprising in combination a flexible knife arranged to present a U shaped recess between its sides to receive a shoe end with the margin of its attached sole projecting beyond the cutting edge of said knife, a cutting block, means for curving the knife to conform in shape to the shoe end, means for moving said knife and block into cutting relation one relative to the other, and means connected with each of said means and governed by the insertion of the shoe in said recess to actuate the same, and means for separating said knife and block at the conclusion of the cutting movement thereof.

18. An organized machine of the type described comprising in combination a flexible knife arranged to present a U shaped recess between its sides to receive a shoe end with the margin of its attached sole projecting beyond the cutting edge of said knife, a cutting block, means for curving the knife to conform in shape to the shoe end, means for moving said knife and block into cutting relation one relative to the other, and means connected with each of said means and governed by the insertion of a shoe in said recess to actuate the same, the latter having connections with said moving means to be operated thereby.

19. An organized machine of the type described comprising in combination knife shaping means, a cutting block, means for moving said block and knife one relative to the other for the purpose described, said knife shaping means being constructed and arranged to operate and conform the knife to the shoe contour independently and prior to the relative movement between said knife and block in making the cutting stroke, substantially as shown and described.

20. An organized machine of the type described comprising a knife adapted to be

shaped to the contour of a shoe end, a cutting block, means for moving said knife and block one relative to the other, independent means for closing said knife upon a shoe presented thereto prior to said relative cutting movement of the knife and block, and dependent means for opening it, substantially as shown and described.

21. An organized machine of the type described comprising in combination a drive shaft, a rounding knife, a cutting block, and means operated by said drive shaft for moving said knife and block one relative to the other, and unitary means under control of the operative for causing the knife to conform to the shape of the shoe end and thereafter to move the knife and block relatively to cut the sole, substantially as shown and described.

22. A machine of the type described comprising in combination rough rounding means provided with a cutting knife and block, constantly moving means constructed and arranged to move said knife and block relatively one toward the other, means for holding said moving means in inoperative position relative to said rounding mechanism having releasing mechanism connected therewith, and means governed by the presentation of work for closing the knife upon the work and actuating said releasing mechanism.

23. A machine of the type described comprising in combination rough rounding means provided with a cutting knife and block, constantly moving means constructed and arranged to move said knife and block relatively one toward the other, means for holding said moving means in inoperative position relative to said rounding mechanism having releasing mechanism connected therewith, means governed by the presentation of work for closing the knife upon the work and actuating said releasing mechanism, and means for separating said knife and block at the conclusion of a cutting movement and to restore said moving means to inoperative position.

24. A machine of the type described comprising in combination rough rounding means provided with a cutting knife and block, constantly moving means constructed and arranged to move said knife and block relatively one toward the other means for holding said moving means in inoperative position relative to said rounding mechanism having releasing mechanism connected therewith, and means governed by the presentation of work for closing the knife upon the work and actuating said releasing mechanism, and means for separating said knife and block at the conclusion of a cutting movement.

25. A machine of the type described comprising in combination rough rounding

means provided with a cutting knife and block, constantly moving means constructed and arranged to move said knife and block relatively one toward the other, means for holding said moving means in inoperative position relative to said rounding mechanism releasing mechanism connected therewith, means governed by the presentation of work for closing the knife upon the work and actuating said releasing mechanism, means for separating said knife and block at the conclusion of a cutting movement, and a tripping device for restoring said constantly moving means to its normal inoperative position.

26. In a machine of the class described, means for producing relative motion between a cutting block and a knife comprising a rotary shaft and eccentric thereon having an arm 32, a member 36 to control the same, a dog 39 for holding the latter, and means for releasing said dog.

27. In a machine of the class described, means for producing relative motion between a cutting block and a knife comprising a rotary shaft and eccentric thereon having an arm 32, a member 36 to control the same, a dog 39 for holding the latter, and means for releasing said dog, said releasing means comprising the lever 44, and the member 55.

28. In a machine of the class described a flexible cutting knife, pivot gages for determining the relative contour of the work and the sides and back of said knife, and means for adjusting said gages.

29. In a machine of the class described, the combination, with a rounding knife presenting a recess adapted to receive the end of a shoe, of a gage for determining the depth to which said shoe may be inserted into said recess, and means, operated by contact of the shoe with said gage for moving the knife to conform to the work and for controlling the operation of the machine.

30. In a machine of the class described, the combination, with a knife having flexible ends adapted to be closed upon the end of a shoe and means to cause said closing movement as the shoe is inserted into the knife,

of yielding means for separating said ends, 50 and means for severing the scrap removed by said knife, whereby the separation of said ends under the influence of said yielding means is facilitated.

31. In a machine of the class described, 55 the combination, with cutting mechanism including a flexible, curved knife, of means operative upon presentation of the work within the knife for changing the curvature of said knife prior to the operation of said 60 cutting mechanism.

32. In a sole rounding machine, the combination of a curved and flexible knife for cutting the marginal portion of a shoe sole, a cutting block, means acting automatically 65 by insertion of the shoe in the curve of the knife for causing the knife to conform to the shape desired and the cutting block to be moved toward and from the knife, and means for rotating the block as it is moved. 70

33. In a machine for rounding shoe soles, the combination of a stationary flexible knife on which the sole to be rounded may be placed and supported, a cutting block movable toward and from the station- 75 ary flexible knife, and work actuated means acting to first cause the flexible knife to conform to the shape desired and subsequent to such shaping movement of the knife to cause the cutting block to be moved toward 80 the stationary flexible knife.

34. In a sole rounding machine, the combination of a curved and flexible knife for cutting the marginal portion of a shoe sole, a cutting block, a cross-head carrying said 85 block, means for moving the block toward and from the knife, a spindle carried by the cross-head and having a pivotally mounted pawl, and a spring for holding the pawl in position to engage the cutting block as the 90 latter rises to turn it horizontally.

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

MERTON D. PHELAN.

Witnesses:

WILBURT D. JONES,
SIDNEY F. SMITH.