3 Sheets—Sheet 1.

S. D. TRIPP.

Machinery for Skiving Boot and Shoe Counters.

No. 207,223. Patented Aug. 20, 1878.

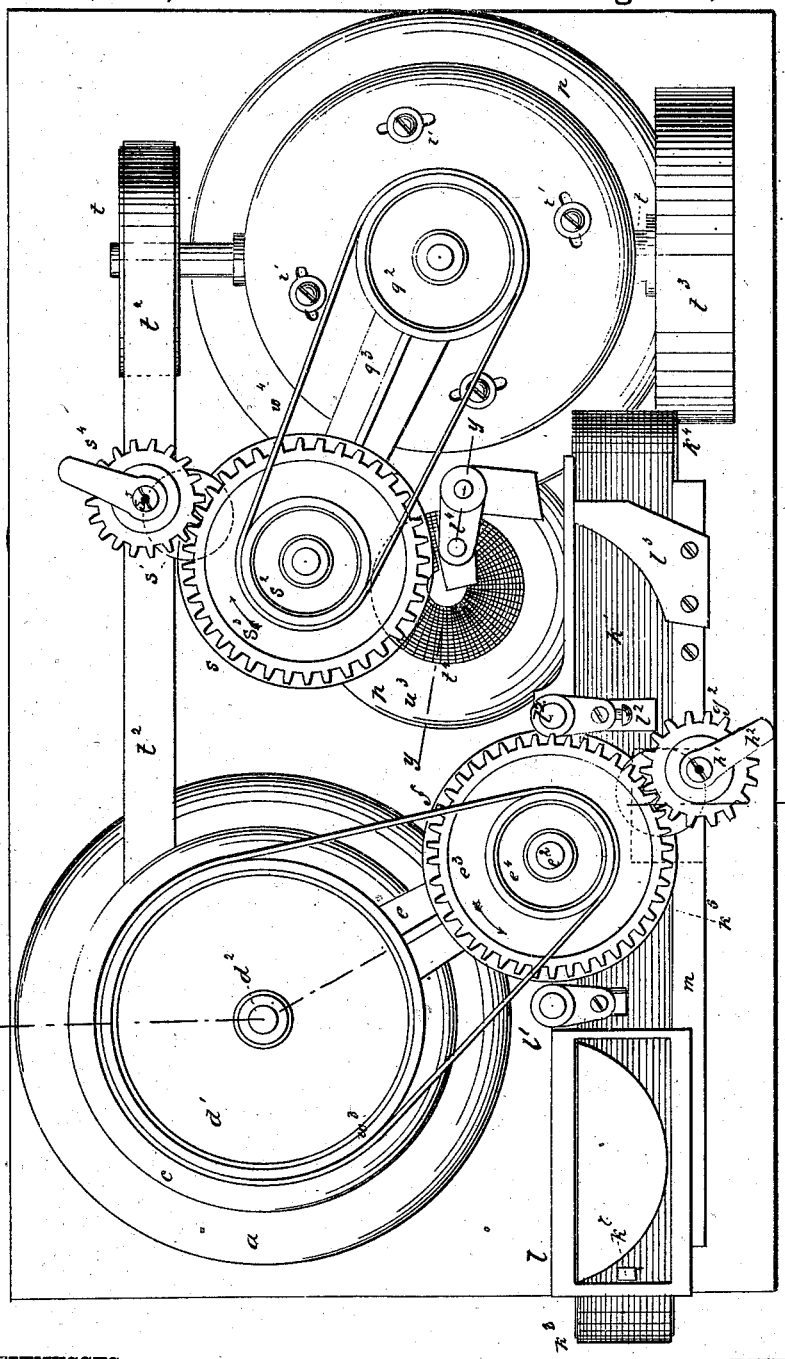

Fig. 1.

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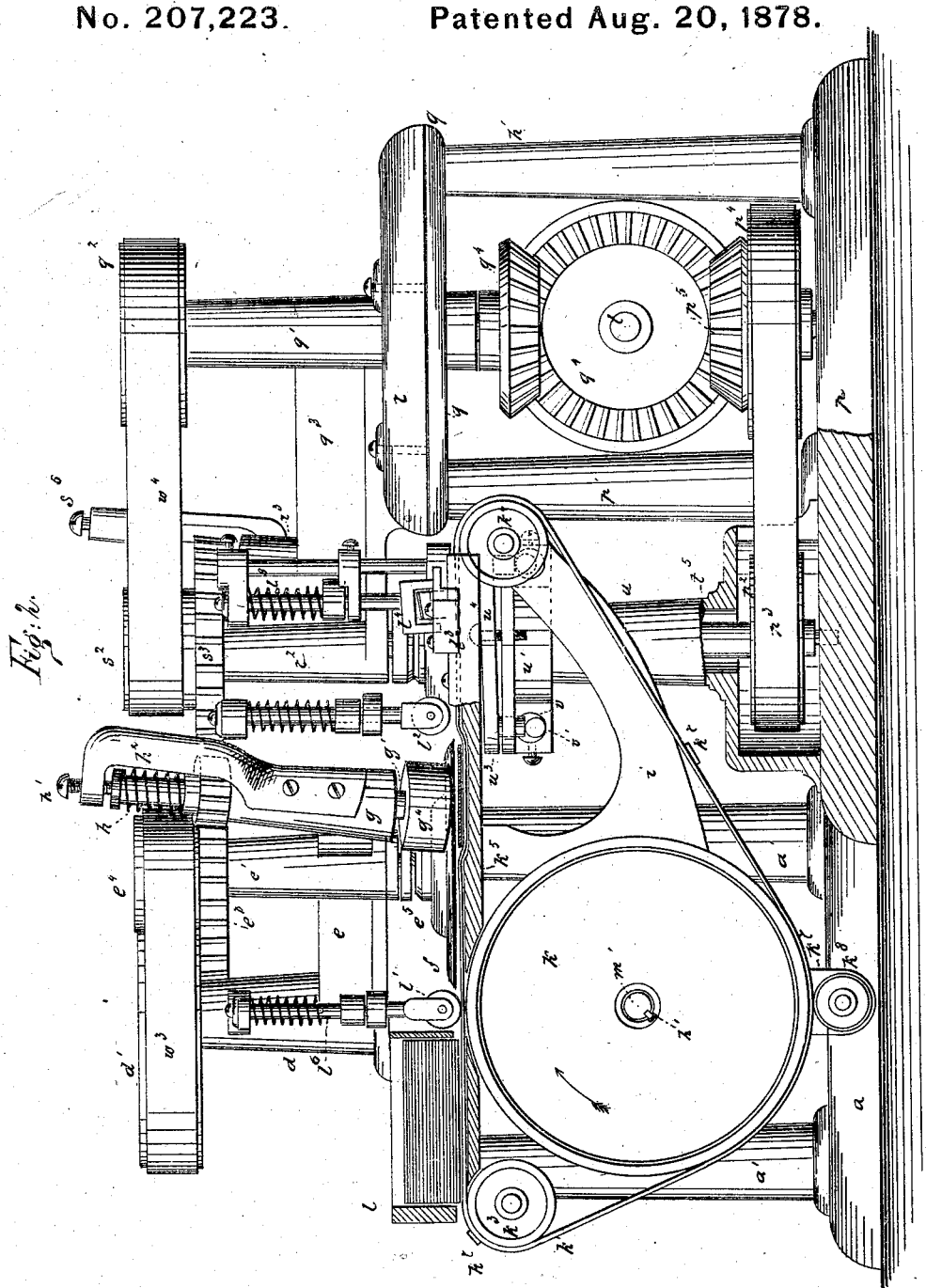
Fig. 2.



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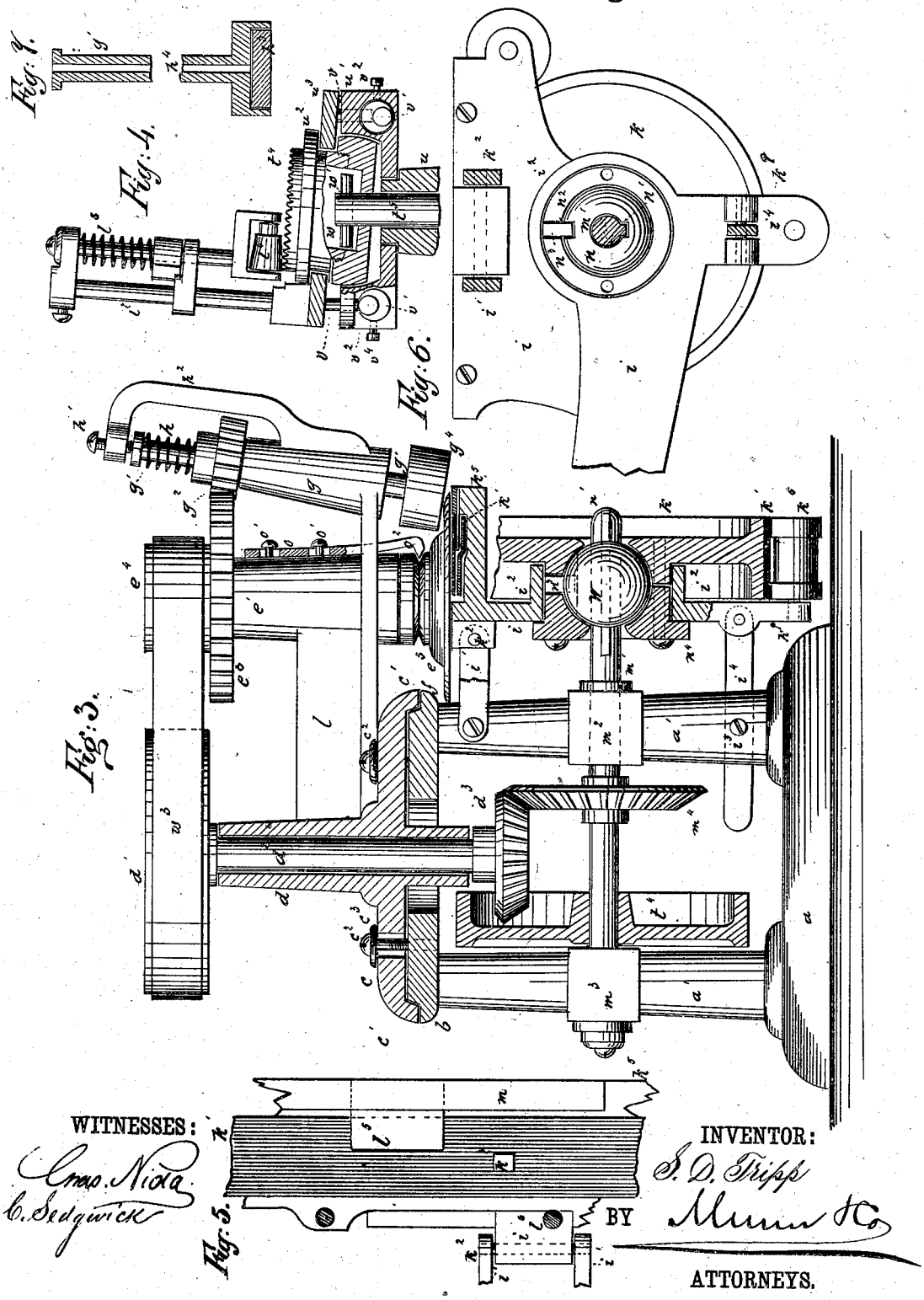

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UNITED STATES PATENT OFFICE.

SETH D. TRIPP, OF LYNN, MASSACHUSETTS.

IMPROVEMENT IN MACHINERY FOR SKIVING BOOT AND SHOE COUNTERS.

Specification forming part of Letters Patent No. **207,223**, dated August 20, 1878; application filed June 25, 1878.

To all whom it may concern:

Be it known that I, SETH D. TRIPP, of Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Machines for Skiving Boot and Shoe Counters, of which the following is a specification:

Machines for skiving or chamfering the edges of boot and shoe counters have heretofore been made in which the counter is skived by a straight knife. The counters are forced against the cutting-knife by feeding-rollers, to cut one edge, and they are then delivered, and must be handled a second time and fed to the same machine, or a second one, which chamfers the other edge.

The objections to these machines are that the stock has to be handled twice, and the straight knives become dull very rapidly and must be removed from the machine for sharpening. The removal and sharpening of the knife is necessary very frequently, especially during the cutting of pasteboard counters, by reason of the gritty particles contained in that material, which rapidly dull the knife.

The object of my invention is to construct a machine which will feed the counters to one knife for skiving one edge, and then carry the counters forward to a second knife, which skives the other edge and delivers the counter in a finished condition; also, to provide for rapidly sharpening the knives without removing them from the machine; and, further, a feeding device which will feed the counters automatically, one by one, at the proper speed.

I accomplish these objects by using a feeding-belt, which carries the bottom one of a pile of counters in a hopper into the machine, where it is grasped by a pressure-roll. The counter is cut by a revolving circular knife, which chamfers one edge, and the counter is then carried forward to a second knife of the same character, which cuts the other edge to the proper bevel, and the counter is then delivered.

The knife is to be sharpened while revolving by an emery-wheel on a shaft hung above the knife, and carrying a gear-wheel, which meshes with the driving-gear of the knife. The shaft of the emery-wheel slides vertically in its bearings, so that the wheel may be pressed in contact with the knife-edge to sharpen it, and it is raised out of contact by a spring. The interior of the emery-wheel is formed as a chamber and filled with felt, which is kept wet to supply moisture during the sharpening operation.

The cutting-knives and feeding-beds are adjustable for different thicknesses of stock, and so as to give the proper bevel to the edge of the counter when cut.

In the drawing, Figure 1, Sheet 1, is a general plan of my machine. Fig. 2, Sheet 2, is a side elevation of the same. Fig. 3, Sheet 3, is a cross-section at the line *x x* of Fig. 1. Fig. 4, Sheet 3, is a vertical section of the secondary feeding-bed at line *y y* of Fig. 1. Fig. 5 is a plan of a portion of the main feeding-belt; and Fig. 6 is an elevation, showing the connection of the driving-pulley of the belt with its shaft.

Similar letters of reference indicate corresponding parts.

I will first describe that portion of my machine which acts to cut one edge of the counter and pass them to the second cutter.

a represents the main supporting-bed, which rests upon the floor, and may be bolted thereto. The bed *a* is circular, and has four pillars, *a'*, rising therefrom, which support at their upper ends the ring plate or table *b*.

c is a circular plate, resting upon the table *b*, and held concentric therewith by flanges c^1, which rest down over the edge of the table *b*, upon a shoulder formed around the edge of *b*. The plate *c* is held upon the table *b* by screws and washers c^2, passing through the elongated slots c^3 in the plate *c* into the table *b*. The slots c^3 are elongated to permit the plate *c* to be turned horizontally upon the table *b* when the screws c^2 are loosened.

d is a hollow vertical post, formed with the plate *c*, and rising therefrom. The upper end of the post *d* forms a bearing for the pulley d^1, which is keyed to a shaft, d^2, passing through the post *d* and table *b*, and carrying upon its lower end the bevel-gear d^3, beneath the table *b*.

e is an arm formed with or rigidly connected to the plate *c* and post *d*, and extending horizontally outside the plate *c*, and having near its outer end a hollow gudgeon or bearing, e^1. There is a vertical shaft or arbor, e^2, (see Fig.

7,) passing through the gudgeon e^1, having keyed upon its upper end a gear-wheel, e^3, and pulley e^4, and upon the lower end of e^2 there is a flange or disk, e^5, to which is attached by screws or other means the revolving knife f. I have shown the knife f in the form of a flat circular disk, with its edge beveled upon the upper side to form a cutting-edge.

g is a second gudgeon on the arm e, at its end outside of the gudgeon e^1. This gudgeon g is hollow, and carries an arbor, g^1, with a small gear-wheel, g^2, at the upper end, connected to the arbor g^1 by a spline or feather in the usual way. g^4 is a wheel of emery or similar material, fast upon the lower end of g^1. The emery-wheel g^4 and arbor g^1 are capable of vertical movement in the gudgeon g, so that the face of the wheel g^4 may be brought in contact with the edge of the knife f, to sharpen the knife. h is a spiral spring around the arbor g^1, where it extends above the gear-wheel g^2. This spring bears upon the hub of the gear g^2, and upon the under side of a collar at the upper end of the arbor g^1, so that the spring tends to raise the arbor g^1, and keep the emery-wheel g^4 out of contact with the knife f. The extent of upward motion of the arbor g^1 is limited by a screw, h^1, which passes through an arm, h^2, from the gudgeon g, extending over the upper end of the arbor g^1, so that the end of the screw h^1 bears upon the end of g^1. This screw is to be used to force the arbor g^1 downward, and cause the emery-wheel g^4 to come in contact with the knife f, to sharpen the same. The gear-wheel g^2 meshes with the gear e^3, and receives motion therefrom, and a spline allows of the vertical motion of the arbor g^1 through the gear g^2, and at the same time connects g^1 and g^2 together.

The gudgeon g is inclined slightly from a vertical position, so that the face of the emery-wheel g^4 which comes in contact with the knife f shall be at an inclination corresponding to the bevel of the knife-edge, and the gears e^3 and g^2 are beveled to correspond. It is desirable to have the sharpening-surface moist to prevent glazing, and I form a chamber, h^3, (see Fig. 7,) inside of the emery-wheel g^4, and fill the same with felt or similar material, which is to be kept moist with water or oil. There is a hole or passage, h^4, from the chamber h^3, passing through the arbor g^1 vertically, and also communicating with a hole through the screw h^1, so that the oil or water may be poured in at the head of the screw h^1 and pass down into the chamber h^3.

i is a frame, hung at the side of the machine, below the knife f, upon the arms i^1, (see Figs. 5 and 6,) which are rigidly connected to one of the pillars a' of the bed a. The frame i carries the driving-pulley k of the feeding-belt k^1, which pulley k is upon a shaft, m^1, passing through a hub, i^2, on the frame i. The manner of revolving the pulley k will be hereinafter described.

The feeding-belt k^1 passes around the loose pulleys k^3 k^4, which turn upon pins on the frame i at opposite ends of the feeding-bed k^5, and the belt k^1 bears upon the lower side of the driving-pulley k; and I provide a friction-wheel, k^6, upon an arm, k^7, from the hub i^2, which wheel k^6 bears upon the belt k^1 at the lower side of the driving-pulley k, to keep the belt from slipping on the driving-pulley. The wheel k^6 is faced with rubber or similar material. The belt k^1 moves upon the upper side of the bed k^5 and beneath the knife f.

l is a hopper, resting upon the outer end of the bed k^5 over the belt k^1, and having the edges adjacent to the belt cut away sufficient to allow a single counter to pass out beneath the hopper l with the feeding-belt. The counters are piled in the hopper l, and held down by a weight or spring, and as the belt k^1 moves beneath the hopper the bottom one of the pile of counters is caught by a projection, k^7, on the belt, and carried into the machine beneath the knife f.

l^1 is a spring pressure-roller sliding vertically on a rod, l^6, from the bed k^5, which pressure-roller takes the counter as soon as it leaves the hopper, and holds it firmly while the knife f is cutting it. l^2 is a second pressure-roller, similar to l^1, which takes the counter as it is carried out from beneath the knife by the belt. m is a rim or guide upon the bed k^5, which serves to guide the counters as they are carried forward by the belt k^1.

The driving-pulley k is revolved by a shaft, m^1, which is held horizontally in bearings m^2 m^3, formed in the pillars a' a' of the bed a, and carries a bevel-gear, m^4, meshing with the gear d^3 on the shaft d^4.

It is necessary to provide for adjusting the bed k^5 and belt k^1 more or less at an inclination crosswise to the plane of the knife f, so that the edge of the counters will be cut or skived at the desired bevel. To accomplish this object, the frame i swings upon the arms i^1 by a pivot, k^2, and thereby causes the bed k^5, pulley k, and the other parts upon the frame i to assume an inclined position; and the frame i is held in position, when adjusted, by a screw, i^3, passing through one of the pillars a', and bearing upon an arm, i^4, which passes through the pillar a', and is connected to the arm k^9 from the hub i^2.

The connection of the driving-shaft m^1 with the pulley k is such as to permit of the above-described movement of the frame i and pulley k. Figs. 3 and 6 show the connection.

w is a ball on the shaft m^1, held to the shaft by a spline or feather, n^1, so as to revolve with the shaft.

The hub n^2 of the wheel k is formed with a socket, sitting upon the ball w, and there is a pin, n^3, passing from the hub n^2 into an elongated slot in the ball w, so that the ball and hub n^2 may revolve together; but the slot allows the pulley k to be turned at an inclination to the shaft m^1.

n^4 is a hub or collar upon the shaft m^1, sitting over the ball n at the opposite side to the hub n^2, and connected with the hub n^2 by

screws, so as to hold the parts together. In Fig. 6 the hub n^4 is removed to show the parts more clearly.

I provide for adjusting the knife f vertically to and from the bed k^5 and belt k^1, to allow for different thicknesses of stock. To accomplish this, the arbor e^2 of the knife is longer between the gear e^3 and the hub of the disk e^5 than the gudgeon e^1, so that the arbor e^2 may move vertically in the gudgeon e; and to hold the disk e^5 and knife f at the desired height, according to the thickness of the stock, there is a plate, o, attached to the side of the gudgeon e^1 by screws o^1, passing through slots in the plate. This plate o extends down adjacent to the hub of the disk e^5, and has a bent end or finger, which passes into a slot, o^2, around the hub of the disk e^5. The knife f is thereby held in position according to the adjustment of the plate o on e^1.

The knife may be positioned over the belt k^1, nearer to or farther from the hopper l, by loosening the screws c^2 of the plate c and turning the plate c and arm e upon the table b, and then secured in place by tightening the screws c^2.

The parts described above constitute a complete machine for skiving one edge of the counter; and to skive the other edge they are to be passed to a second part of the machine.

As the counters are made in various shapes, I find it advantageous to form the two parts of the machine upon separate beds, so that the relative position of the two parts of the machine may be varied. If the counters are oblong, with nearly parallel straight edges, they will be fed to the second knife by continuing them in the same direction as when carried to the first knife; but if the counters have one edge straight and the other edge circular, the knives will be positioned as seen in the drawings, and the counters, after leaving the first knife, will be carried at right angles to their first movement.

The principal parts of the second portion of the machine are similar in construction to the parts heretofore described, and there is therefore no need of a more detailed description and reference.

p is the main bed, having pillars p^1, supporting the table q, which has upon it a plate, r, connected by screws r^1. q^1 is a hollow post, carrying the shaft for the pulley g^2 at the top, and with a bevel-gear, q^4, beneath the table q. q^3 is the arm from the plate r, carrying the gudgeons or supports r^2 r^3 for the knife s and emery-wheel s^1, respectively. s^2 is the driving-pulley of the knife s, and s^3 is a pinion on the arbor of the knife s, gearing with the pinion s^4 on the arbor of the emery-wheel s^1.

The emery-wheel s^1 may be forced in contact with the knife s by the screw s^5, and is held up by a spring, as described in the other parts of the machine. These parts are identical with the corresponding parts heretofore described, except that there is no provision for vertical adjustment of the knife s.

t is a shaft, supported horizontally in bearings on the pillars p, having upon it a bevel-gear, p^5, which meshes with the gear q^4, and it also carries a pulley, t^1, which is connected by a belt, t^2, with a pulley, t^4, on the shaft m^1 of the first described portion of the machine. The shaft t carries the main driving-pulley t^3, which is to be connected with a suitable power. The pulley t is removed in Fig. 3.

As the counter is brought out from under the knife f after one edge is cut, the end passes under the pressure-roller l^2, and it is carried straight forward until the end comes against the curved guide l^3, fixed upon the guide m. The curved guide l^3 acts upon the circular edge of the counter, and causes it to turn half-way around, and continue forward at right angles to the bed k^5 until the forward end is caught under the pressure-roller l^4, which bears upon the revolving circular bed t^4, and the counter is then free from the pressure-roller l^2.

To prevent the rear end of the counter becoming caught between the knife f and belt k^1, I provide a plate, l^5, (see Fig. 5) upon the bed k^5 behind the pressure-roller l^2. The belt k^1 passes under this plate l^5, so as to free the belt from the counter at that place, and the turning of the counter is thereby facilitated.

The bed t^4 is at the upper end of the vertical shaft t^5, which is supported in a step in the bed p, (see Fig. 2,) and p^2 is a pulley at the lower end of the shaft t^5, connected by a belt, p^3, with a pulley, p^4, on the bed p beneath the main shaft t. There is also a bevel-gear, p^5, on the arbor of the pulley p^4, which meshes with the gear q^4, so as to drive the bed t^4.

u is a hollow post rising from the bed p around the shaft t^5, and having at its upper end, beneath the bed t^4, a table, u^1. The manner of connecting the shaft t^5 with the bed t^4, so as to allow of adjusting the bed t^4, is shown in Fig. 4.

There is a flange, u^2, around the outside of the bed t^4, and this flange u^2 rests upon a ring, u^3, which surrounds the bed t^4. The ring u^3 is adjusted to and from the table u^1 by screws u^4, to bring the bed t^4 nearer to or farther from the knife s. The ring u^3 is held concentric with the table u^1 by pins v, attached to the under side of the ring u^3 and passing through holes in the table u^1. I also make use of the pins v as a means for giving an inclination to the surface of the bed t^4, so that the cutting of the counter will be done at a proper bevel.

v^1 v^1 are short rollers, turning in boxes v^2 at the under side of the table u^1. The ends of the rollers v^1 project at each side of the boxes v^2, and the pins v are in such a position that their lower ends rest upon the projecting ends of the rollers v^1. The ends of v^1 are eccentric to the axis of the rollers, and as the rollers are turned in the boxes v^2 the bed t^4 is thereby raised or allowed to drop at either side, to incline the bed more or less.

By this means, and the use of the screws u^4, the vertical and inclined adjustment of the

bed t^4 is regulated. The under side of the bed t^4 sits down into a socket in u^1, and the shaft t^5 projects through the under side of the bed t^4 into a cross-slot, w, where there is a cross-pin, w^1, through the end of the shaft t^5. The pin w^1 serves to revolve the bed t^4 by contact with the sides of the slot w, but permits the adjustment of the parts, as described. The rollers v^1 may be held in position by the screws v^4 at the side.

The pressure-roller l^4 is supported upon a rod, l^7, on the bed t^4, and is provided with a spring, l^8, so that it may yield to permit the counters to pass under it. It is somewhat conical in shape, to aid in turning the counter and present it properly to the knife s. The surface of t^4 is roughened to keep the counter from slipping. The skiving of the counter is completed by the knife s, and the counter then drops into a box or other place.

The projections k^7 on the belt k^1 are at the proper distance apart for feeding the counters from the hopper l at the right intervals.

The shaft m^1 is revolved by a belt, t^2, from the pulley t^1 on the main shaft t, as described, to the pulley t^4 on m^1, and the revolution of the arbor d^2 is communicated by a belt, w^3, to the arbor e^2 of the knife f. The gear g^2 of the emery-wheel g^4 is smaller than the gear e^3, and the wheel g^4 is revolved rapidly.

The belt w^4 connects the pulleys q^2 and s^2, to revolve the knife s and emery-wheel s^1.

The knives f and s may be revolved in either direction to cut the counters as they are passed through the machine. The arrows show the direction in which the knives turn when arranged as in the drawings.

The revolving knife is very effective for the purpose of skiving the counters, as aforesaid. It is not so liable to be broken as a straight knife, does not dull so quickly, and may be readily sharpened in the machine by the device shown, or by equivalent devices.

The combined machine is an important improvement, for the reason that the work is done more rapidly than heretofore, and the time usually consumed in handling the counters twice is saved; and the machine is especially adapted to the heavy board stock which is now coming into extensive use for counters of boots and shoes.

I do not limit myself to the details of the machine as shown, nor to any particular form of feeding device. The knife f may be constructed so that it may be adjusted at an inclination to the bed and the bed be fixed, and the knife s may be adjustable in a similar manner. Neither do I limit myself to the relative position of the two knives and the other parts of the machine. The details may be varied without departing from my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a skiving-machine, the combination, with feeding mechanism, substantially as described, of two rotary knives, beveled on the upper edge, and arranged to skive the edges successively, as shown and described.

2. The combination and arrangement of the belt k^1, pulley k, bed k^5, friction-pulleys k^3 k^4, pressure-roller l^1, hopper l, and knife f, substantially as and for the purposes set forth.

3. The swinging frame i, supporting the feeding mechanism, in combination with the knife f, substantially as and for the purposes described.

4. The knife f, in combination with the arbor e^2, adjustable vertically in its bearing, substantially as and for the purposes set forth.

5. The combination and arrangement of the plate c, arm e, and gudgeon or support e^1 for the knife-arbor with the table b, substantially as described, and for the purposes set forth.

6. The ball-and-socket connection of the shaft m^1, with the driving-pulley k of the feeding-belt, in combination with the swinging frame i, carrying the feeding device, substantially as and for the purposes described.

7. The emery-wheel having a chamber filled with felt or similar material, and with a passage from the chamber through the arbor of the wheel, substantially as and for the purposes set forth.

8. The combination of the feeding-belt k^1, knife f, pressure-rollers l^1 l^2, guide l^3, pressure-roller l^4, bed t^4, and knife s, substantially as set forth, and for the purposes mentioned.

9. The revolving bed t^4, adjustable vertically and so as to vary its inclination to the knife, in combination with the secondary knife s, substantially as set forth.

10. The means for adjusting the bed t^4, consisting of the ring w^3, table u^1, pins v, and eccentric rollers v^1, substantially as described.

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