The object of the present invention is to provide in one machine means for trimming or rib reinforcement of an inner sole and at the same time setting or compacting the reinforced rib so as particularly to make a distinct angle or groove at the inner junction of the rib with the body of the inner sole. The purpose of such a sharp or distinct angle is to facilitate passage of the stitch-forming instruments in sewing the inseam of a welt shoe, and location of the stitches of such seam in a definite line close to the outer surface of the inner sole and close against the inner side of the rib.

The reinforcement of the type referred to is commonly a sheet of woven fabric, such as cotton duck, laid upon and cemented to the surface area of the inner sole bounded by the stitch receiving rib, and turned up and cemented to the inner surface of the rib. Such reinforcing material, when applied to the inner sole protrudes at its margins more or less beyond and over the edge of the rib, and requires to be trimmed at or parallel to such edge (in cases where it is not folded around the rib and pressed closely against the outer side thereof and into the outer rib angle). Such reinforcement also, although tacked somewhat into the inner angle of the rib when being applied, usually does not lie closely enough against the inner surface of the rib and deeply enough in the inner rib angle, at least after its excess margin has been cut off in a trimming machine, for proper formation and location of the inseam stitches by which the upper and welt are secured to the inner sole rib in making shoes. Hence the usual practice followed heretofore has been to past the reinforced inner sole, after trimming, between the pressing instruments of a rib setting machine to bring it into the condition requisite for best work in inseaming.

It is the purpose of the present invention to combine in one machine means for both cutting off the excess of reinforcing fabric extending beyond the inner sole rib, and at the same time setting the reinforcing material deeply and fully into the vertex of the inner angle between the rib and the inner sole body, in the course of one and the same operation in a single machine. The following specification and accompanying drawing disclose means which I have devised for effecting this object, and illustrate the principles of the invention for which I claim protection herein.

In the drawing—

Fig. 1 is a side elevation of a machine containing the invention;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a fragmentary perspective view of one part of the setting means and the cooperating trimming knife;

Fig. 4 is a perspective view of the cooperating member of rib setting means, being the member which particularly crowds the reinforcing material into the rib angle;

Figs. 5 and 6 are fragmentary sectional views showing the instruments of Figs. 3 and 4 in two different positions;

Figs. 7 and 8 are fragmentary perspective views of a work piece showing it respectively before and after being operated on by the machine.

Like reference characters designate the same parts wherever they occur in all the figures.

Referring first to Figs. 7 and 8, the type of inner sole there shown in a fragmentary way comprises a body a having an upstanding rib b for reception of the stitches by which the upper and welt of a shoe are united to the inner sole, and having a sheet c of reinforcing fabric. The rib here shown is of composite character made of a core and an enveloping strip of fabric attached to the body a. But this showing is illustrative and typifies any form of rib whether integral with the body or originally separate and attached by any suitable means. The reinforcing material c is usually a sheet of cotton duck, but may be of other suitable material, and is adhesively united to the area of the inner sole within the rib and to the inner side of the rib. Its marginal part c', which projects to a greater or less extent over or beyond the rib, as indicated in Fig. 7, needs to be cut off, and the bend c" which enters to some extent within the inner angle of the rib, needs to be tucked and forced closely into that angle and against the base of the rib in order to prepare the inner sole for most efficient use in the subsequent inseaming step.

The means which I have devised for cooperatingly setting and trimming the rib reinforcement comprise a pair of cooperating pressing members, one of which is provided with a lip adapted to indent the inner rib angle, a knife, and means for operating these parts in proper timing with automatic work feeding means. The pressing principles are embodied in this illustration in a stationary work support 10 and a reciprocative presser foot 11. The stationary member is conveniently made as a narrow bar-like table which is secured rigidly to a bracket 12 rising from the base 13 of a machine
frame which additionally supports other operating instruments and actuating means thereof. Said support 19 projects forwardly from the bracket 12 into the clear and has a lip 14 on its extremity, projecting slightly from the adjacent surface of the support and having a narrow edge which, however, is not sharp enough to cut the reinforcing material when the latter is pressed against it. This thin edged lip is substantially straight in the direction of the feed of the work for a length substantially equal to, or preferably slightly greater than, the length of a single step of the work feed, and its extremities in the feeding direction are curved or inclined downwardly so as to permit free feeding of the work without obstruction.

The complemenal presser 11 is adapted to reciprocate toward and away from the work support or presser 18, (vertically in the illustrated embodiment), and is secured to a bar 15 which is fitted slingly to guides in an overhanging arm 16 of the machine frame. Presser 11 is suitably located and formed to bear against the outer side of the inner sole rib b when the latter is laid over the upper side of the support 10, substantially as shown in Figs. 5 and 6.

The trimmer is a knife blade 17 having a cutting edge on its lower end, which is secured to a shank 18 mounted on a bar 19 which also reciprocates in the arm 16 beside the bar 15. The knife travels in a path close to the rear side of the presser foot 11 and is pressed against a cutting plate 20 set into the upper side of the work support in a depression adjacent to the lip 14.

A main shaft 21 mounted in the overhanging arm 16 and driven by a belt pulley 22, reciprocates the bar 19 by means of a crank 23, connecting rod 24 and sleeve 25 adjustable secured to the bar and to which the connecting rod is coupled by a wrist pin. The presser 11 is normally depressed and forced against the work by a spring 26, suitably made fast to the machine frame and arranged to bear on the presser bar 15. An abutment arm 27 is secured to the presser bar 15 and overlies sleeve 25 in position to be engaged and lifted by the latter when the knife is raised, at such times and for such duration as to permit feeding of the work by the feed means presently described.

The machine includes also a spring actuated work retainer 28 which in this instance is a roll carried by the end of an arm 29 pivoted at 30 to a bracket 31 secured to the end of the arm 18. The work retainer is suitably located to bear on the surface of an inner sole adjacent to the rib thereof on which such inner sole is placed in the position shown by dotted lines in Fig. 1 (and by full lines in Figs. 5 and 6 also), with its rib between the pressers 10 and 11. A spring 32 bears on the arm 29 and reacts against an abutment 33 on the end of a rod which projects from the lower end of bracket 31 through an opening in the arm 28.

Periodic feeding of the work is effected by a pointed feed pin 34 carried by a reciprocating bar 35 and adapted to be advanced through a slot in the shaft 21 actuating and withdrawn. Bar 35 is movable endwise in guideways in an arm 36 secured to the outer end of an oscillating shaft 37 in the base, and adapted to be moved from side to side by oscillative movement of said shaft. The latter is thus moved by an eccentric 38 on the main shaft 21 actuating through intermediate mechanism 39 to give shaft 37 a back and forth movement through a predetermined angle with each complete rotation of the main shaft. The bar 35, which carries the feed finger or pin 34, is reciprocated by an oscillating shaft 40 in the base, which is connected to the bar 35 by a crank 41 and connecting rod 42, and driven from shaft 21 by an eccentric 44 thereon and a connecting rod 45 engaging the eccentric and pivoted to a crank arm 46 on shaft 40. These shafts (37 and 40) are timed suitably to cause advance or rise of the feed pin during the swing of the feed arm in one direction and to withdraw from the work before the end of this swing, remaining withdrawn clear of the work throughout the swing of the feed arm in the opposite direction. The knife advances to cut, and withdrawn when the work is held stationary between feeding steps; and the lifting means for the presser 11 are so arranged and adjusted that the latter does not rise and release the rib until the feed pin has somewhat entered the under side of the rib, at least sufficiently to impart a positive feeding motion to it. The retainer 29 assures that the work will not be displaced otherwise than in the line of feed after having been released by rise of the presser 11. These devices and instruments are organized to impart feeding steps to the work slightly shorter than the width of the cutting knife, to assure a sufficient overlap of successive cuts. Provided these conditions are met, the absolute values of knife width, rise and descent of the feed pin, and length of swing of the feed arm may be anything desired.

When a work piece is to be placed in the machine and removed, the presser 11 is lifted further than it rises in normal automatic operation, and in being so lifted, a roll 451 which it carries protruding from its forward side comes to bear on a cam surface 47 of the retainer arm 28 and displaces the retainer 28 far enough from the work support to leave free room for placement and removal of work pieces. In the normal automatic operation, roll 451 never reaches the cam surface. The presser may be thus raised by the operator at will, through the medium of a lever or the like, (not shown), which is coupled by a connecting rod 48 with a lever 49 pivoted at 50 and having an offset arm or finger 51 underlyling a finger 52 protruding from the presser bar 15 and which may be a part of the abutment 27 previously described.

The cutting plate 20 against which the edge of the knife is forced in trimming off the reinforcing fabric is preferably a piece of metal enough softer than the tool steel of which the knife is made to avoid injury to the latter, while sufficiently hard and tough to support the fabric against the thrust of the knife and endure a multitude of repeated knife impacts without being destroyed.

In the action of the operating tools, the movable presser 11 is forced by the spring firmly, and with a sudden action somewhat like a hammer blow, against the inner sole rib in each position of rest assumed by the latter after a feeding step; and in so pressing the work, it causes the lip 14 of the work support or stationary presser to be deeply crowded into the inner angle between the inner sole body and rib. The principles of this action are shown by Fig. 6, although with some departures from exact detail necessitated by the exaggerated thickness of which the layers of fabric are shown for clarity. The lip presses with such intensity of unit pressure on the reentrant bend of the reinforcing fabric as to set this bend deeply into the inner rib angle and bring it closely against
the side of the rib. Immediately after each pressing step, the knife comes down and makes a further extension of the cut in the protruding margin of the reinforcement. The result is substantially that shown in Fig. 8, in which the flap C of the reinforcement lying against the rib is trimmed off on a line C parallel to the edge of the rib, and bends up from the main body of the reinforcement from a distinct line C.

What I claim and desire to secure by Letters Patent is:

1. A machine of the type having a base, a bracket rising from the base, and an overhanging arm, means for operating upon reinforced ribbed innersoles consisting of a narrow table projecting laterally from said bracket adapted to support the rib of such an innersole on its upper side and abut at its end against the surface of the innersole adjacent to the rib, a presser movable in the overhanging arm toward and away from the table to cooperate with the latter in gripping the innersole rib, and a knife similarly movable beside said presser in position to sever reinforcing material extending over the table, said table having a lip on its extremity projecting toward the overhanging arm and arranged to indent the innersole rib and reinforcing material in the angle between such rib and the adjacent body of the innersole.

2. A machine of the type having a base, a bracket rising from the base, and an overhanging arm, means for operating upon reinforced ribbed innersoles consisting of a narrow table projecting laterally from said bracket adapted to support the rib of such an innersole on its upper side and abut at its end against the surface of the innersole adjacent to the rib, a presser movable in the overhanging arm toward and away from the table to cooperate with the latter in gripping the innersole rib, a knife similarly movable beside said presser in position to sever reinforcing material extending over the table and being formed with a substantially straight edge transverse to the width of the table, and a work feeder having a work engaging portion movable in the direction of said knife edge to feed the innersole in the intervals between pressing and cutting operations of the said presser and knife, the table having on its extremity a lip projecting toward the overhanging arm and formed with a thin edge which is substantially straight in the direction of feed of said work feeding means.

3. An innersole rib finishing machine comprising a table formed to support the stitching rib of an innersole and to engage at its end the body part of such a sole adjacent to the base of such rib, a presser arranged to cooperate with the table in gripping such a rib, a knife guided to reciprocate beside said presser toward and away from the rib supporting surface of the table and having a cutting edge on its extremity nearest to the table, and means for reciprocating said knife so as to cut off against the table so much of the rib as protrudes from the contiguous side of the presser, and for reciprocating the presser to clamp and release the rib; the table having on its before mentioned end a narrow edged lip arranged to indent the rib of the innersole in the inner angle thereof under the pressure exerted on the outer side of the rib by said presser.

4. A machine of the type having a base, a bracket rising from the base, and an overhanging arm, means for operating upon reinforced ribbed innersoles consisting of a narrow table projecting laterally from said bracket adapted to support the rib of such an innersole on its upper side and abut at its end against the surface of the innersole adjacent to the rib, a presser movable in the overhanging arm toward and away from the table to cooperate with the latter in gripping the innersole rib, and means for reciprocating said presser to bear against and release alternately such a rib; the table having on its before mentioned end a lip formed with a narrow edge projecting from said overhanging arm and adapted to indent the innersole rib and the reinforcing material applied thereto, in the inner angle between the rib and body of the innersole by virtue of the pressure exerted by the presser against the outer side of the rib.

PERCY W. VALENTINE.