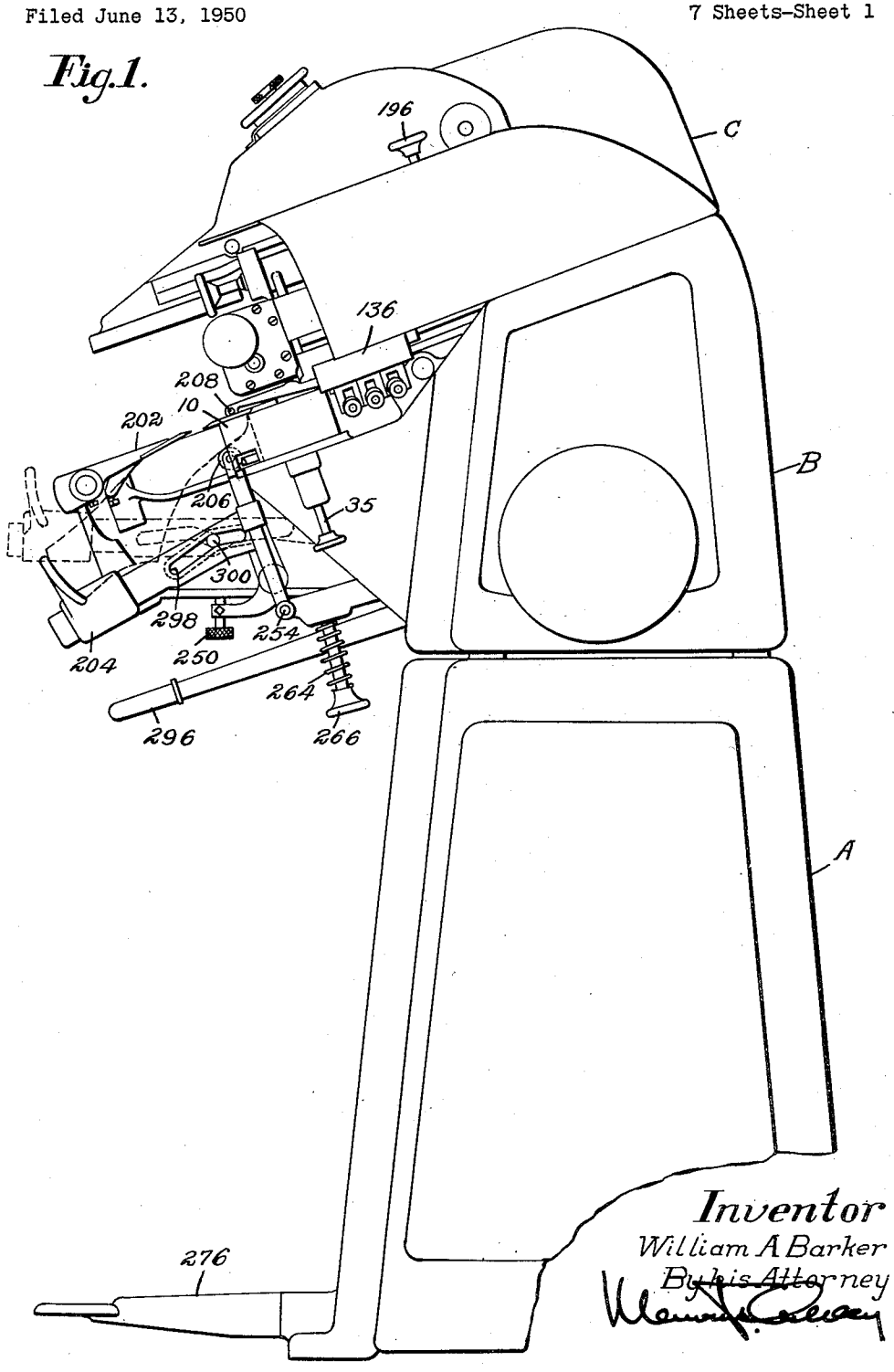
June 12, 1951 W. A. BARKER 2,556,410

TOE LINING TRIMMING MACHINE

Filed June 13, 1950 7 Sheets-Sheet 1

Fig. 1.



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June 12, 1951 W. A. BARKER 2,556,410

TOE LINING TRIMMING MACHINE

Filed June 13, 1950 7 Sheets-Sheet 2

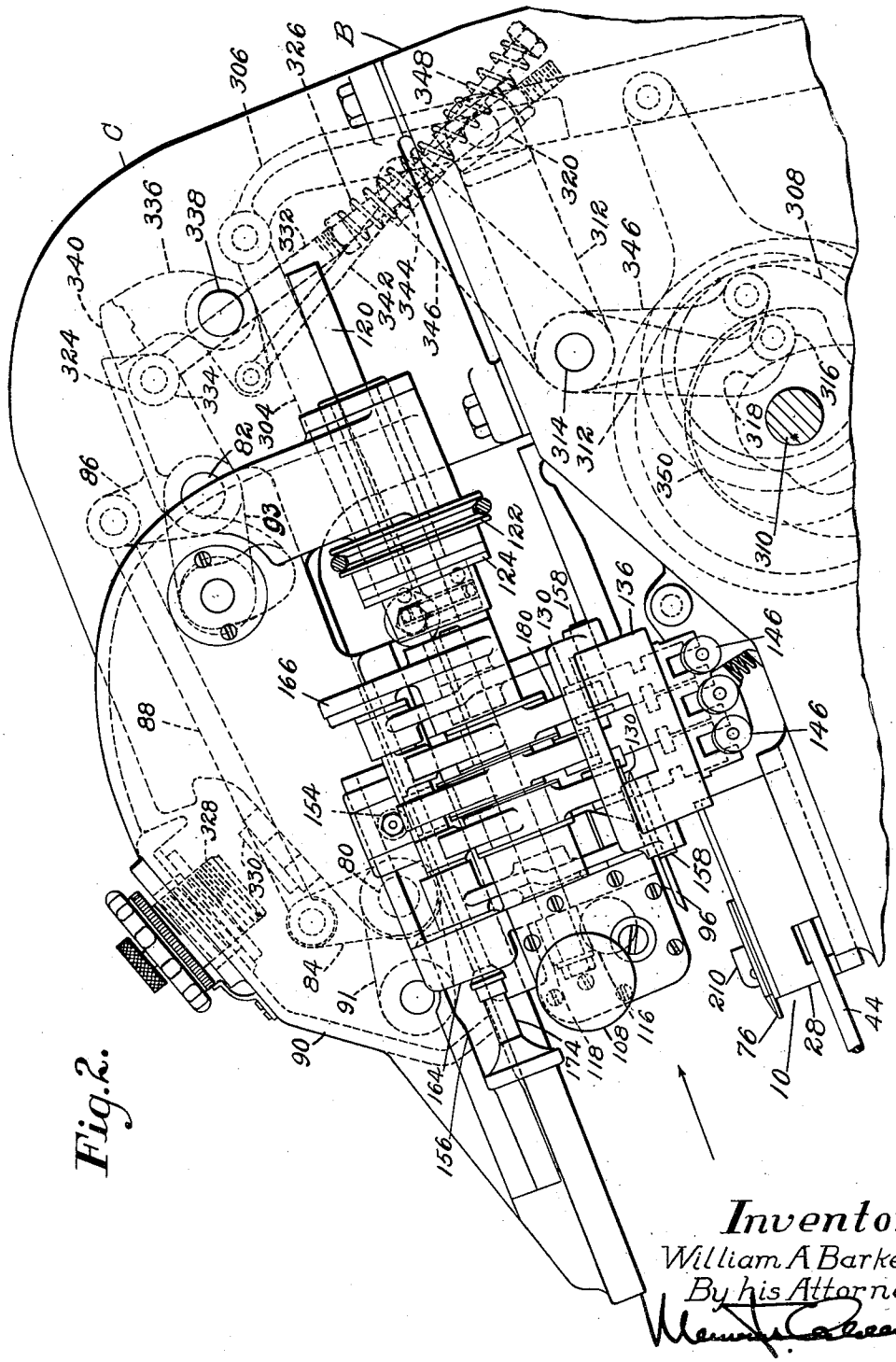


Fig. 2.

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June 12, 1951 W. A. BARKER 2,556,410

TOE LINING TRIMMING MACHINE

Filed June 13, 1950 7 Sheets-Sheet 3

Fig. 3.

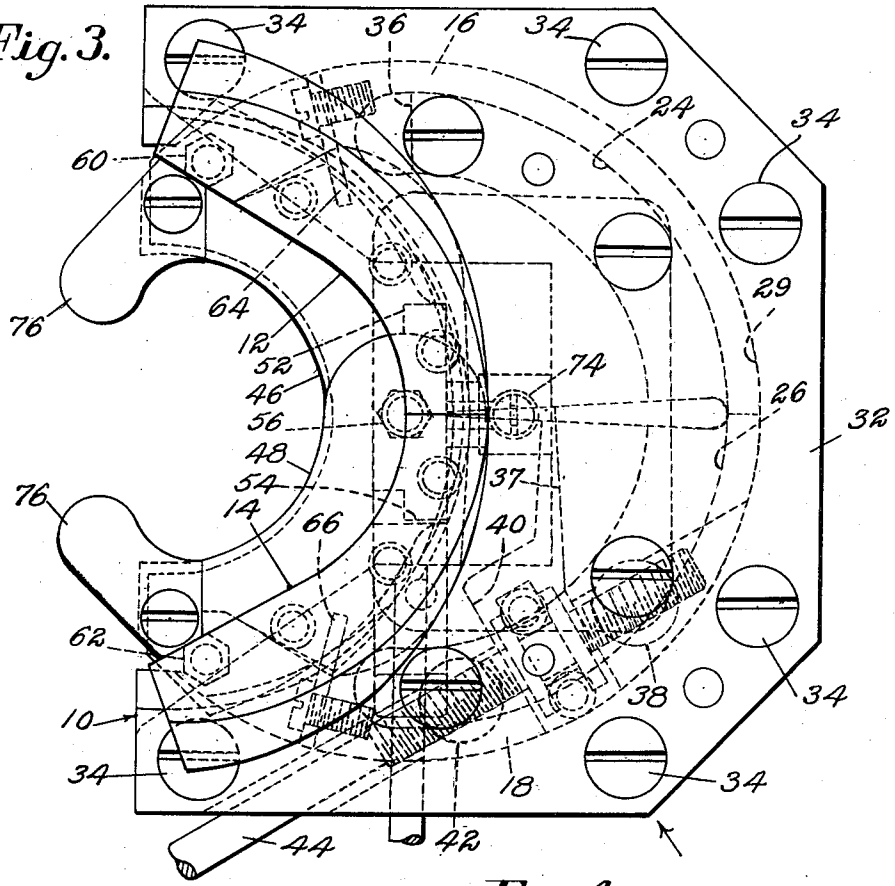
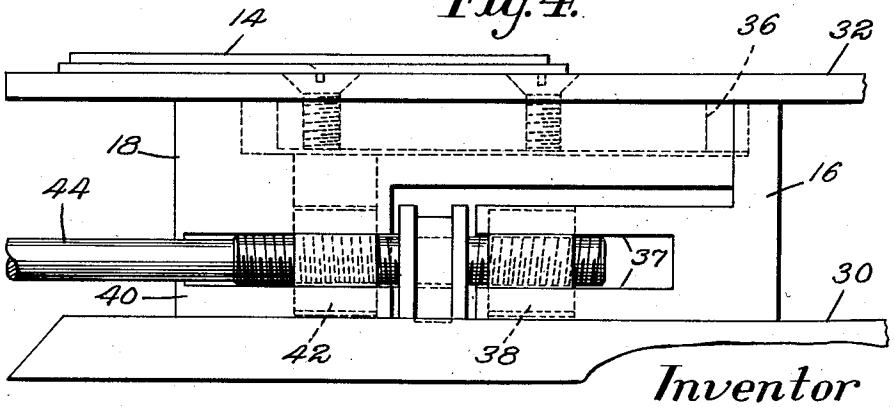


Fig. 4.



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June 12, 1951 W. A. BARKER 2,556,410

TOE LINING TRIMMING MACHINE

Filed June 13, 1950 7 Sheets-Sheet 4

Fig. 5.

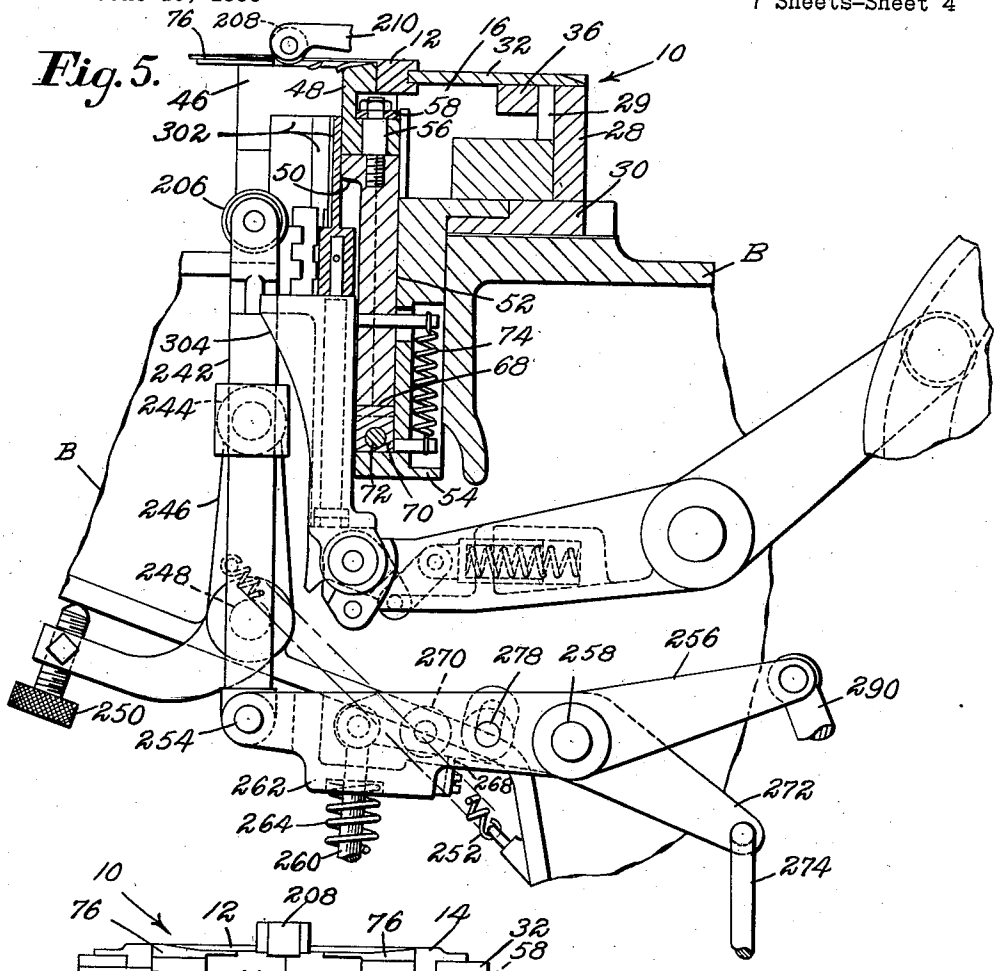
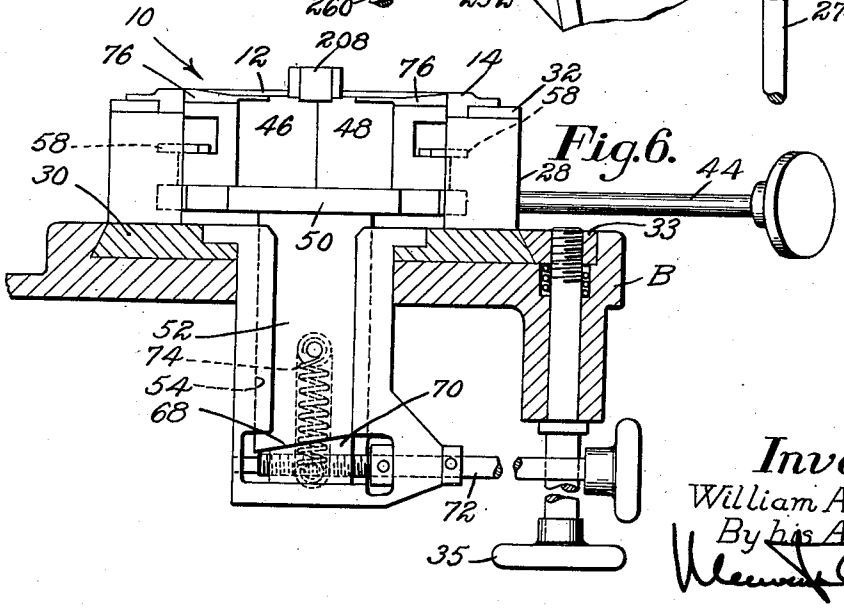


Fig. 6.



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June 12, 1951 W. A. BARKER 2,556,410

TOE LINING TRIMMING MACHINE

Filed June 13, 1950 7 Sheets-Sheet 5

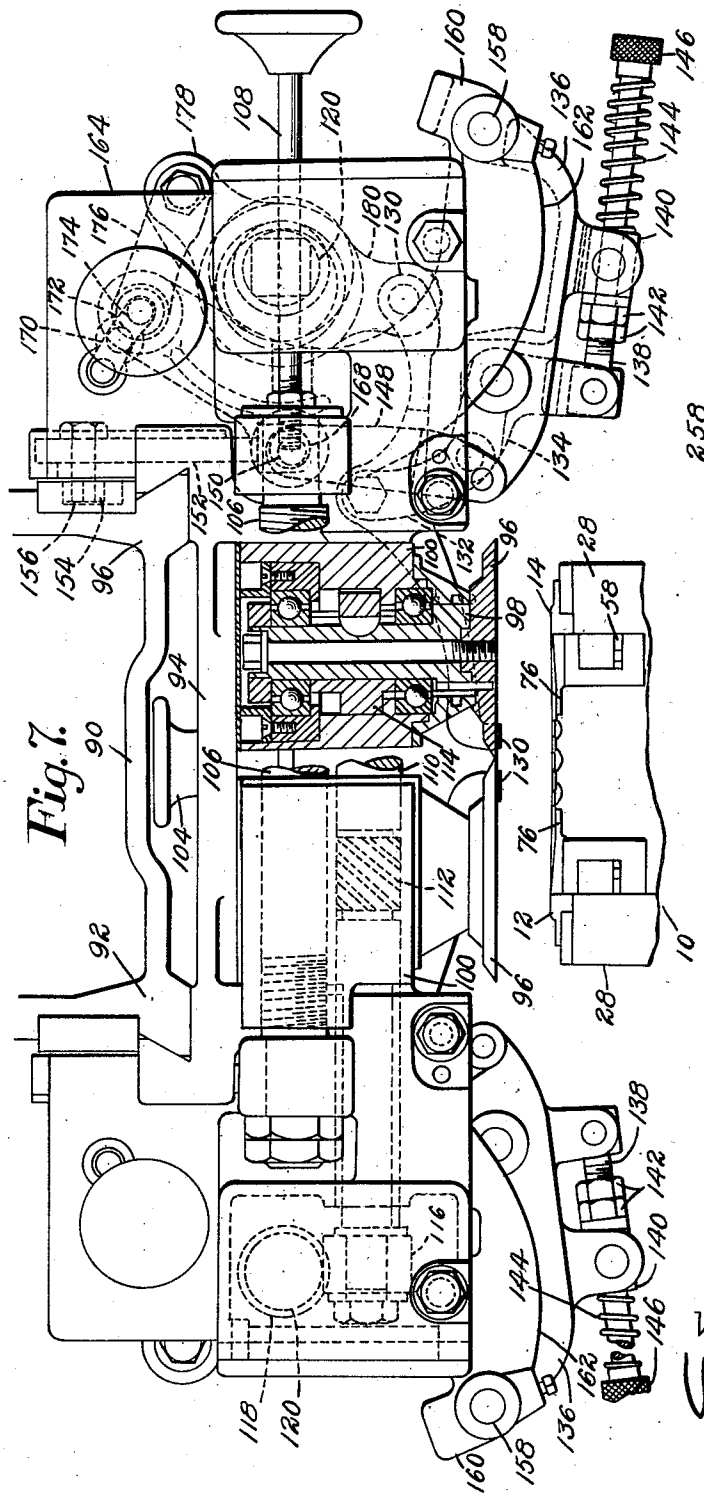


Fig. 7.

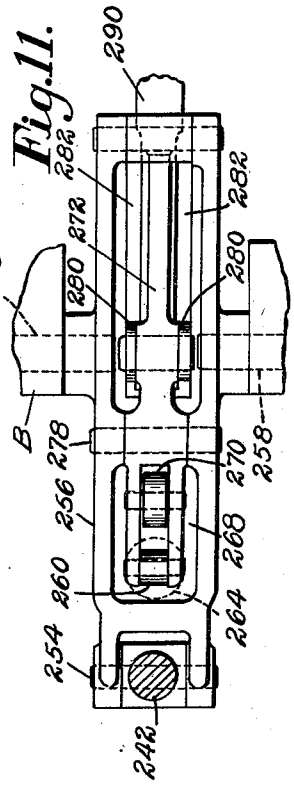


Fig. 11.

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June 12, 1951 W. A. BARKER 2,556,410

TOE LINING TRIMMING MACHINE

Filed June 13, 1950 7 Sheets-Sheet 6

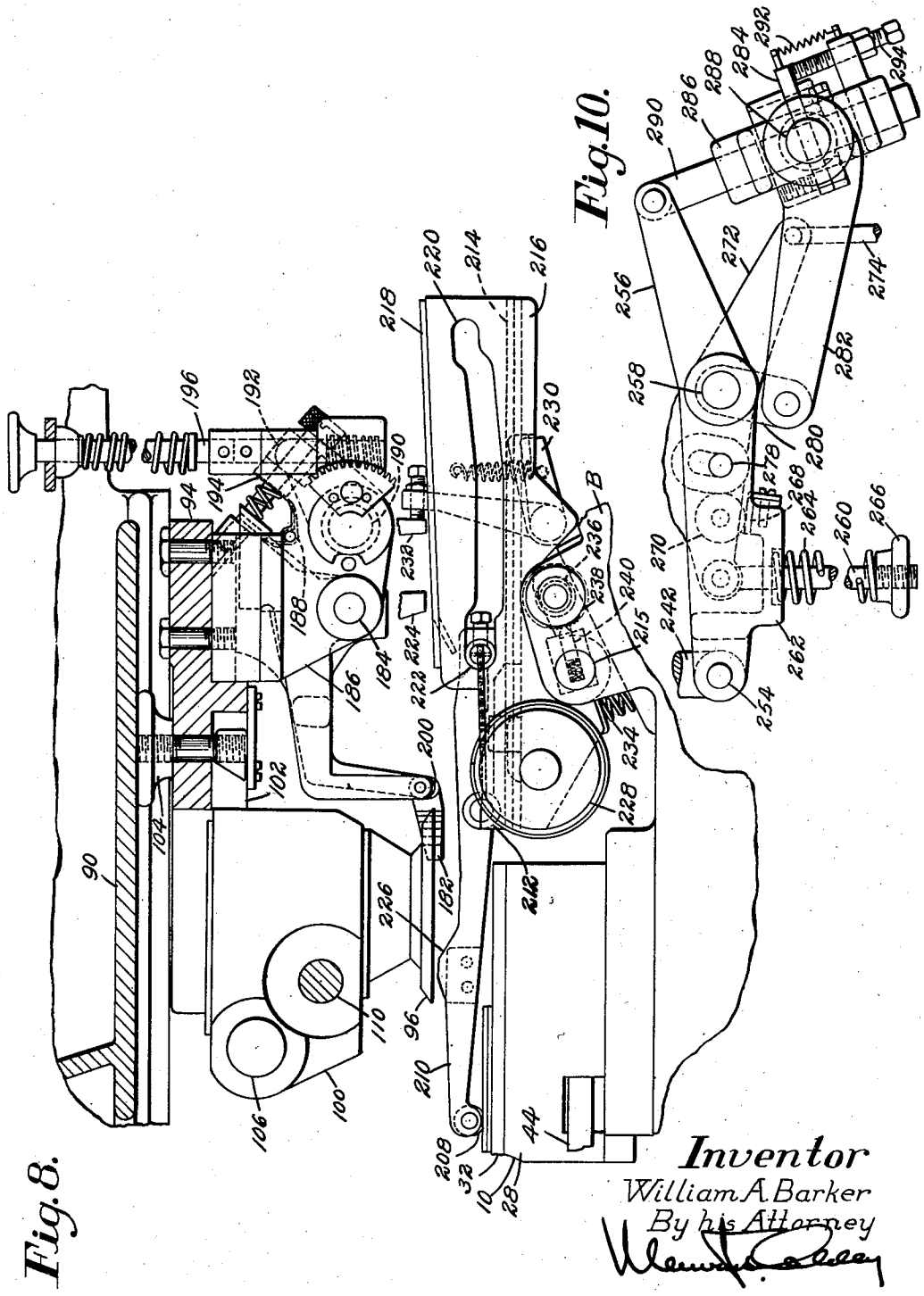


Fig. 8.

Fig. 10.

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June 12, 1951 W. A. BARKER 2,556,410

TOE LINING TRIMMING MACHINE

Filed June 13, 1950 7 Sheets-Sheet 7

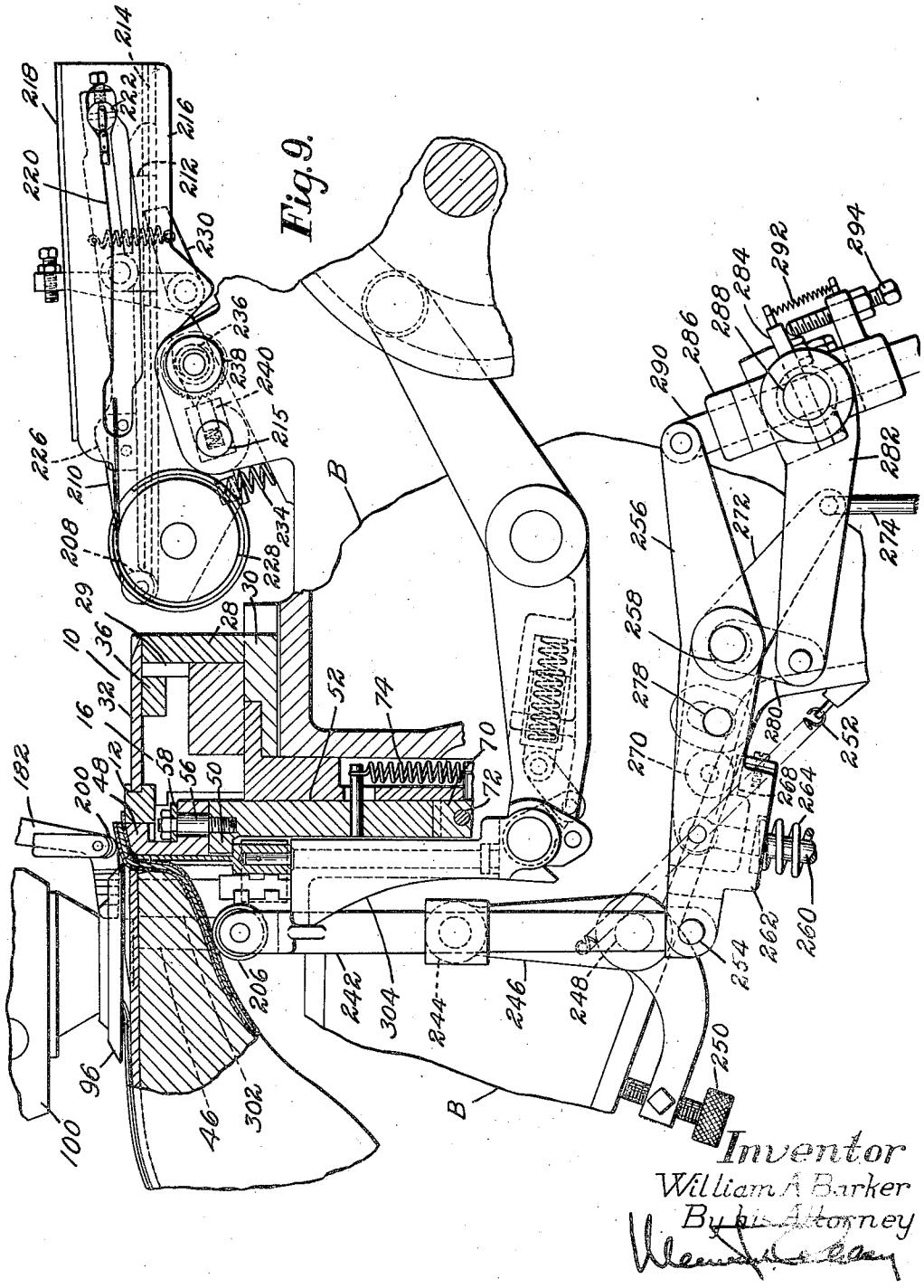


Fig. 9.

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Patented June 12, 1951

2,556,410

UNITED STATES PATENT OFFICE

2,556,410

TOE LINING TRIMMING MACHINE

William Arthur Barker, Leicester, England, assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application June 13, 1950, Serial No. 167,762
In Great Britain August 24, 1949

4 Claims. (Cl. 12—83.5)

1

This invention relates to trimming machines and more particularly to machines for severing unnecessary upper material in the toe areas of shoes being prepared for toe lasting. Prior to this trimming operation a partially fabricated shoe will normally have had the overlasted margins of the upper fastened to the insole as far forward as the tip line. Ahead of that line a special precaution is essential so to eliminate the surplus lining materials as to facilitate obtaining a smooth and neat appearing upper when tensioned over its last and attached about the toe to the insole.

Toe upper material commonly comprises, in addition to an outer layer of leather or fabric, such inner layers as a lining, a toe stiffener and sometimes a doubler. The several layers may differ considerably in such characteristics as toughness and thickness when used in various makes of shoes. A machine found to yield good trimming results has hitherto provided means including a toe-receiving bed for holding a shoe bottom up, trimming means movable in shearing relation to the bed and means for spreading the toe lining margins on the bed ahead of the trimming means. For a machine of this type to be sufficiently versatile to operate satisfactorily on large numbers of different types and styles of shoes it is now recognized that its work holding means and operating instrumentalities must be adjustably organized and suitably correlated in time and relative position throughout a working cycle.

An object of this invention, therefore, is to provide an improved toe lining trimming machine of the type referred to which shall be efficient, highly adaptable and easily usable in preparing widely different sizes and shapes of shoes for toe lasting.

In accordance with this object, one feature of the invention resides in the provision in a trimming machine of the type referred to of members for lining the aforementioned toe receiving bed and means for adjusting their heightwise position relative to the bed whereby shearing may effect trimming of variable depth or produce a selected overall thickness in the marginal upper material.

Another of the various features of the invention relates to a novel arrangement and coordination of the work holding means and operating instrumentalities whereby shoes may be presented bottom up for trimming by the machine in a convenient manner, an insole engaging roll being mounted for cooperation with a toe supporting

2

roll to facilitate initial location of the toe portions with respect to the shearing means.

The above and other features of the invention together with novel arrangements and combinations of parts will now be described in more detail in connection with an illustrative embodiment, reference being had to the accompanying drawings, in which:

Fig. 1 is a side elevation of an exemplary machine in which the invention is embodied, a shoe being shown in operative position;

Fig. 2 is an enlarged side elevation of the upper part of the machine shown in Fig. 1;

Fig. 3 is a plan view of a shearing block assembly;

Fig. 4 is a view of parts shown in Fig. 3 looking looking in the direction of the arrow seen in that figure;

Fig. 5 is a side elevation, partly in section, of the shearing block assembly, toe supporting roll and associated wiping mechanism;

Fig. 6 is a front elevation of the shearing block assembly;

Fig. 7 is a front elevation, partly in section and viewed in the direction of the arrow in Fig. 2, of trimming mechanism when raised above the shearing block;

Fig. 8 is a side elevation, portions being broken away and disclosing instrumentalities in initial inoperative positions;

Fig. 9 is a side elevation, partly in section, of elements shown in Figs. 5 and 8 but at a subsequent stage when trimming is about to commence.

Fig. 10 is a side elevation of mechanism for operating the shoe supporting roll; and

Fig. 11 is a plan view of parts shown in Fig. 10.

The illustrative machine is a toe lining trimming machine of the type disclosed in United States Letters Patent No. 2,260,483, issued October 28, 1941, and 2,287,275 issued June 23, 1942, on applications filed in the name of W. T. B. Roberts, and also resembles in some respects certain features of construction set forth in United States Letters Patent No. 2,466,798, issued April 12, 1949, and granted on application of H. E. Elliott et al. The illustrative machine embodies improvements over both the Elliott and Roberts machines and in these respects will be described in detail though it will suffice if present structure common to either of these earlier disclosures is hereinafter but briefly mentioned.

As viewed in Fig. 1, the machine frame comprises a base A, an intermediate column B, and a head C inclined to enable an operator easily to view the work to be performed therein. As in

the machines of the patents cited, a shearing block assembly generally designated 10 comprises articulated blocks 12, 14 (Fig. 3) with flat upper shearing faces and having inner faces curved to correspond generally with a portion of the toe of an upper on an inverted last, as shown in Fig. 1. The blocks 12, 14 are respectively secured to carrier blocks 16, 18 (Fig. 3) and the latter are provided on their upper faces with concentric recesses 24, 26 respectively. The carrier blocks 16, 18 are peripherally slidable in a rotary housing including a body 28 (Fig. 6) having a circular interior surface 29 (Fig. 3), a base plate 30, and a cover plate 32, all secured together as by screws 34. An arcuate guide plate 36 affixed to the cover plate 32 extends into the concentric recesses 24 and 26 thereby retaining circular exterior portions of the blocks 16, 18 in engagement with the body 28. The base plate 30 is dovetailed for rotatable engagement with a correspondingly formed slideway portion of the column B. Bearing on the base plate 30 and this slideway portion is a clamp plate 33 (Fig. 6). Both the slideway and clamp plate are bored to receive a locking bolt 35, the turning of which serves to loosen or secure the shear block assembly 10 in adjusted position in the machine.

Means are provided (Figs. 3, 4) for adjusting the carrier blocks 16, 18 with respect to each other and to the body 28 by movement about the axis of its surface 29. The carrier block 16 has a bifurcated arm 37 extending toward the carrier block 18 and carrying a pin 38 provided with a left-hand threaded bore. Similarly, the carrier block 18 has a bifurcated arm 40 for carrying a pin 42 having a right-hand threaded bore. A rod 44 extending through a portion of the body 28 has oppositely handed threaded portions received by the pins 38, 42 respectively. Rotation of the rod 44 accordingly moves the pins together or apart and so causes the space between the articulated blocks 12, 14 to be enlarged or diminished as they are thus simultaneously moved suitably to accommodate any particlar size and shape of toe portion to be trimmed.

Inner lining members 46, 48 (Figs. 5 and 6), over which the margins of the upper are to be spread, are, as will now be explained, mounted for movement heightwise of the shear blocks 12, 14 as well as pivotal movement concentric with the axis of the shear block body 28. The members 46, 48 are arcuate, have top shearing faces inclined upwardly to the shearing faces of blocks 12, 14, and are seated on an arcuate flange 50 formed at the top of a vertical slide 52. The latter, as best seen in Fig. 6, is movable heightwise in a guideway 54 by means about to be described. The guideway 54 is supported by the base plate 30. The members 46, 48 are mated and mounted for pivotal movement about a common pivot stud 56 threaded into the flange 50, the stud having an axis coincident with the axis of the body 28. For retaining the members 46, 48 in sliding contact with the flange 50, an arcuate plate 58 engaging a shoulder portion of the members 46, 48 is spaced from the top of the flange 50 by studs 60, 62 (Fig. 3) threaded into the latter. The lining members 46, 48 are maintained in contact with the inner faces of the articulated shear blocks 12, 14 by means of strips 64, 66 which are attached to the carrier blocks 16, 18 respectively and engage slots formed in said members. The bottom of the slide 52 is inclined to provide a cam face 68 (Fig. 6) engageable with a complementary slidable wedge 70. The latter

is actuated to raise or lower the slide and thereby adjust heightwise distance between the tops of the lining members and the shear faces of the blocks 12, 14 by rotation of a rod 72 threaded into the wedge and having thrust collars engageable with the guideway 54. The slide is yieldingly held in engagement with the wedge 70 by a spring 74.

Ears 76 are attached to the lining members 46, 48 respectively for the purpose of providing supports against which marginal upper material in the locality adjacent to the endmost pulling over fasteners may be strained as it is turned outwardly.

As in the patents referred to above, the illustrative machine is provided with operating instrumentalities, about to be described, that are mounted for movement above the shear block assembly 10 and also provided with other work supporting elements later to be described. Pivot pins 80, 82 (Fig. 2) mounted transversely in the head C of the machine serve as journals for bell cranks 84, 86 respectively. An arm of each of these bell cranks is maintained in phase with an arm of the other by means of a coupling link 88. A beam 90 is pivotally suspended for parallel up-and-down movement on other arms 91, 93 of the bell cranks 84, 86 respectively. The beam 90 is actuated by means subsequently described and provided with guideways 92 (Fig. 7) extending from the front to the rear of the machine slidably to support a reciprocable carriage 94 on which the aforementioned instrumentalities are mounted.

A pair of rotary trimming knives 96 (Fig. 7) are carried by the carriage 94. Normally, the knives are arranged equidistant from the longitudinal center line between the guideways 92 and their cutting edges are very nearly in contact. Each knife 96 is affixed to a spindle 98 perpendicular to the shear faces of the blocks 12, 14 and rotatably mounted in a bearing block 100 (Figs. 7 and 8). Both blocks 100 are adjustably spaced apart to enable the cutting edges to be moved together when the knives are worn, and are secured by a clamping block 102 (Fig. 8) to the under side of the carriage 94. Engagement of the clamping block 102 with the bearing blocks is controlled by a hand nut 104 having a threaded stem extending through the carriage 94. A transversely extending shaft 106 (Fig. 7) supported in lugs of the carriage 94 has oppositely handed threaded portions engaging correspondingly threaded bores of the bearing blocks, and turning an extension 108 of the shaft 106, when clamping pressure has been temporarily relieved by the hand nut 104, moves the blocks 100 and consequently the knives 96 together or apart.

The left-hand knife 96, as viewed from above in Fig. 7, rotates counterclockwise while the other knife 96 rotates clockwise. For this purpose a knife driving shaft 110 extends transversely through the blocks 100 and has spiral gears 112 respectively meshing with spiral gears 114 on each spindle 98. A spiral gear 116 mounted on each end of the shaft 110 meshes with a spiral gear 118 on the forward ends of the shafts 120, 120 (Fig. 2) extending on each side of the machine, said shafts to be again referred to hereinafter. Each of the shafts 120 is driven by a pulley 122 rotatably mounted on a bearing 124 supported by the beam 90. The pulleys 122, 122 are driven by belt and gear connections (not

shown) with the driving pulley shaft of the machine.

As in the Elliott patent referred to, the illustrated machine is provided with two sets of three upper margin lifting and outturning members 130 (Figs. 2, 7), one set to operate on each side of the toe and shear block assembly 10, the novel mechanism for actuating and adjusting them for use on different widths and styles being suspended from both sides of the beam 90 as will now be described. As the arrangement is similar on both sides of the machine, it will suffice to describe the elements as organized on one side only, as shown in Figs. 2 and 7. Each member 130 extends transversely of the machine and is fulcrumed on a curved link 132 (Fig. 7) the lower end of which is pivotally connected to one arm of a bell crank 134. The three bell cranks 134 are alined and pivotally mounted in a bracket 136 extending beneath the members 130. The other arms of the respective bell cranks 134 pivotally carry an end of an adjusting rod 138. Each rod 138 is threaded through a swivel block 140 supported by the bracket 136. For a purpose subsequently to be described two nuts 142 and a collar on each of the rods 138 constitute an adjustable abutment with the inner face of the block 140, while a compression spring 144 engageable with the outer face of the block extends to a knurled head 146 formed on the outer end of the rod 138.

The bracket 136 comprises two parallel arms and a bridging portion, the arms being pivotally supported by coaxial pins respectively mounted in the lower ends of the two links 148. The upper ends of the links 148 carry a pin 150 extending through a vertical slide 152. An upper portion of the latter rotatably supports a cam roll 154 having engagement with a cam track 156 extending forwardly and rearwardly in the beam 90 and generally parallel with the inclined path of the carriage 94. The cam tracks 156, 156 on opposite sides of the beam 90 are formed to move the slides 152 vertically at predetermined stages in the cycle of movement of the carriage 94, the outturning members 130 thereby being appropriately raised from contact with the work margins after progressing longitudinally thereof and while continuing to move inwardly and outwardly of the shoe bottom. During inoperative forward movement of the carriage 94 the cam tracks 156 permit the members 130 to be lowered to their margin engaging levels.

The bracket 136 is also supported on two coaxial pins 158 mounted in a swingable yoke 160. The latter straddles the three outturning members 130 and comprises two parallel curved levers 162, 162 joined by bridging portions. Plates 164, 166 respectively project from the carriage 94 coaxially to support the fulcrum pins 168, 168 on which the respective levers 162 are pivotally mounted. An arcuate slot 170 in the plate 164 is concentric with the axis of the pins 168, 168. In the plate 166 three holes 172 are arranged in an arc also concentric with the axis of the pins 168, 168. A rod 174 extends through the slot 170, through the yoke 160, and through a selected hole 172 in which the rod 174 may be locked. Spaced along the rod 174 are three links 176, each pivotally connected with an arm of an eccentric 178 mounted on the shaft 120. The three eccentrics 178 are angularly offset 120° and another arm 180 (Figs. 2, 7) of each eccentric is connected to an outturning member 130.

The construction just described enables the range of the outturning members 130 to be adjusted widthwise, i. e., moved toward or away from the center of the machine. Thus, referring to Fig. 7, when the rod 174 is adjusted counterclockwise, the links 176 rotate the eccentrics 178 in a similar direction, thereby shifting the arms 180 and hence the members 130 outwardly. The yoke 160 during this adjustment is rotated counterclockwise about its fulcrum pins 168, 168, causing the bracket 136 and bell crank 134 to move upwardly but the latter advantageously does not change the angle relation between the outturning members 130 and the links 132 by which said members 130 are supported. The heightwise position of the work engaging portions of the members 130 may be adjusted by suitably rotating the nuts 142 on the rods 138, and the pressure with which the members 130 engage an insole is regulated by turning the knurled head 146, springs 144 causing the engagement to be yieldable. From the above it will be seen that the work engaging portions of the members 130 move in a widthwise path as in the machine shown in the Elliott et al. patent previously referred to, that each work-engaging portion moves out along a straight line and returns lifted in a semicircular path out of contact with the work, and that the bracket 136 and yoke 160 permit widthwise adjustment of the outturning members 130 without distorting their operating paths. The shaft 120 is preferably rotated at a speed to effect about three or four outward movements of each outturning member as the carriage 94 moves the knives 96 rearwardly in their trimming stroke.

Thirteen upper pressing fingers 182 (Fig. 8) are individually pivoted on a rod 184 supported by a bracket 186 secured to the carriage 94. A rearward face of each finger is engageable with one arm of a spring 188 fixed to the bracket. A shaft 190 extends through the bracket 186 and supports a crank 192 in which an adjustable stop 194 is threaded. The stop 194 bears on the other arm of the spring 188 and thereby provides independent pressure for urging an individual finger toward the work, movement in such direction being limited by engagement of the finger with a face of the bracket 186. A vertical worm shaft 196 meshing with a worm sector secured to the shaft 190 may be utilized to adjust the pressure exerted by the finger 182. A pair of rollers 200, corresponding with rollers in the Elliott et al. machine, are arranged near the knives 96 and at opposite sides of the fingers 182 to press the outturned margin upon the cutting block assembly 10 before trimming. These rollers are also supported by levers pivotally mounted on the rod 184 and spring means is provided to enable adjustable pressure to be exerted by the rollers on the work as they move rearwardly.

As in former machines of this type the illustrated machine includes a sole abutment 202 (Fig. 1), a heel end abutment 204 (Fig. 1), and a shoe supporting roll 206 (Figs. 1, 5) for holding the shoe against undesired movements during the cycle. These work supporting means about to be further described are effectively coordinated with the operating instrumentalities throughout a cycle. In the illustrative machine the operating cycle commences with the carriage 94 in its most rearward position and raised by upward movement of the beam 90 from its trimming level. Accordingly, the carriage is initially moved toward the front of the machine and elevated to support

the operating instrumentalities out of contact with the marginal upper material which is then not being held down upon the shearing blocks 12 and 14. An insole engaging roll 208 (Fig. 5) and the shoe supporting roll 206 are mounted for cooperation in a novel manner to limit the extent to which the latter can thrust a shoe toe upwardly with respect to the shear block assembly 10.

The insole engaging roll 208 is retractably mounted rearwardly of the shear block assembly 10, this arrangement enabling an operator properly to lock a shoe heightwise of that assembly without danger of fouling the knives 96 when, in the next cycle, they are again lowered and moved rearwardly. The roll 208 is rotatably mounted on a pin fixed in a forward end of a lever 210 fulcrumed in lugs of a carrier 212 (Figs. 8, 9). The bottom of the latter is provided with a T-shaped slideway adapted to engage a guide rail 214. The rail 214 is secured to a housing 216 which is pivotally mounted on a pin 215 supported by lugs extending from the column B. The housing 216 is provided with side flanges bridged by a cover plate 218. Identical slots 220 formed in each of the side flanges are respectively engaged by cam rolls 222 carried one on each side of the lever 210. The cam slots 220 are so formed that, when the carrier 212 moves rearwardly to retract the roll 208 from operative position, the rolls 222 are forced downward to lift the insole engaging roll 208 clear of the outspread upper margin and later the rolls 222 are forced upward to swing the lever 210 and thereby lower the roll 208 to a position where the continued rearward movement of the knives 96 will not be obstructed.

For moving the carrier 212 rearward a lug 224 (Fig. 8) projects from the carriage 94 for engagement with a projection 226 on the lever 210. As the carriage 94 moves rearward the lever 210 (Fig. 9) is accordingly moved rearward and against the resistance of a coil spring 228 connected thereto and mounted on the housing 216. The roll 208 then having been shifted behind the shear block assembly 10 and the projection 226 having been disengaged from the lug 224, a spring loaded pawl 230 pivotally secured to the housing 216 restrains the lever 210 from return movement by engaging a notch provided in the carrier 212. As the machine cycle ends, the knives 96 having passed over the lowered insole engaging roll 208, another lug 232 on the carriage 94 trips the retaining pawl 230 and frees the carrier 212 so that the lever 210 may be returned to its forward and operative position by means of the spring 228.

Means are provided whereby the roll 208 may be adjusted to position shoes heightwise appropriately with respect to the trimming plane of the knives 96. The housing 216 is urged by a compression spring 234 seated therein and bearing on the column B to engage the periphery of an eccentric 236. The latter is supported on a shaft rotatably mounted in lugs of the housing 216, the shaft having affixed at one end a serrated disc 238. A spring pressed plunger 240 engageable with the disc 238 prevents undesired rotation of the eccentric, and turning of the shaft adjusts the periphery of the eccentric 236 suitably to shift the housing 216 about the pin 215, thereby moving the roll 208 as desired with respect to the knives and the shear face.

When presenting a shoe bottom up to the machine the toe end is inserted in the shear block assembly 10, the insole being lightly held against the insole engaging roll 208 and the sole abutment 202. The heel end abutment 204 and shoe supporting roll 206 are thereafter also utilized to hold the work as will be described. The roll 206 may be rubber covered and is rotatably carried by a forked rod 242 (Fig. 5) slidably mounted in a trunnion 244. The latter is rotatable in an arm of a bell crank 246 pivotally supported by a pin 248 secured to the column B, the other arm of the bell crank 246 carrying an adjustable stop screw 250 that is yieldingly retained in engagement with the column B by a spring 252. The roll 206, by means of the screw 250, is adjustable forwardly and rearwardly and can be swung so as to facilitate removal of the shear block assembly 10 when desired. The rod 242 (Fig. 5) is pivotally mounted on a pin 254 received by the forked end of a member 256 (Fig. 11) fulcrumed on coaxial pins 258, 258 having bearings in the column B. A rod 260 passes through a portion 262 of the member 256 and carries a spring 264 engageable with the portion 262 and a hand nut 266 (Fig. 10) threaded on the rod 260. Rotation of the hand nut 266 adjusts upward pressure exerted by the roll 206 on a shoe before the locking mechanism about to be described becomes effective.

A wearing plate 268 is affixed to the member 256. A roll 270 rotatably mounted in the forked end of a lever 272 is engageable with the plate 268. The rod 260 is pivotally connected to the forward end of the lever 272 and the rearward end of the latter is connected by a rod 274 to a treadle 276. A pin 278 fixed in the member 256 passes through an arcuate slot in the lever 272. The spring 264 accordingly causes the lever 272 to be supported on the roll 270 and the lower end of the slot is urged against the pin 278. The lever 272 pivotally supports a forked link 280 (Figs. 8, 9) connected to a locking lever 282 comprising two parallel arms that are joined at their rearward ends by a bridging plate and a locking plate 284 (Figs. 9, 10) bolted to the bridging plate. The locking lever 282 extends through a rocking frame 286, and both the lever 282 and frame 286 are pivotally mounted on coaxial fulcra 288 (Figs. 9, 10) journaled in the column B. A shaft 290 pivotally connected to the member 256 extends through bearings formed in the frame 286 and is arranged to slide therein and through a hole in the locking plate 284 in a direction at right angles to the fulcra 288. The locking lever 282 and rocking frame 286 are yieldingly held in engagement by a spring 292, and an adjusting screw 294 extends through a portion of the frame 286 to abut the plate 284 thereby enabling alignment of the hole in the locking plate with the bearings of the shaft 290 in the frame.

Depressing the treadle 276 first moves the member 256 and the lever 272 as a unit about the coaxial pins 258, the shaft 290 sliding through the locking plate 284 until the roll 206 lightly clamps the shoe against the insole engaging roll 208. Further depression of the treadle effects yielding of the spring 264 and allows the lever 272 to rock on the roll 270. The link 280 consequently is shifted downward causing the locking lever 282 to move the locking plate angularly and bind the shaft 290 against further movement. The member 256 is thereby prevented from further movement and the shoe supporting roll 206 is locked against heightwise displacement of a shoe even when the insole engaging roll 208 is withdrawn from the shoe bottom.

As is the case in former machines of this type, particularly the one disclosed in the aforementioned Patent 2,260,483 to Roberts, the heel end

abutment 204 is so arranged in the illustrated machine that when a hand lever 296 (Fig. 1) is raised, initial movement of the latter causes the abutment to move rearward to engage the heel end of a shoe in the machine and urge the toe into the recess of the shear block with sufficient pressure to allow the operator to release his hold of the shoe. Further movement of the hand lever then trips clutch mechanism enabling power means to urge the abutment more firmly against the shoe to hold it against longitudinal movement during the trimming. To facilitate removal of the trimmed shoe at the end of a machine cycle and insertion of the next shoe, the present machine also includes means for guiding the abutment 204. It is provided with an inverted T-shaped cam slot 298 engaged by a cam roll 300 supported by the column B. As the cycle ends the heel end abutment is shifted upward by the slot 298 and roll 300 to a position indicated in phantom form in Fig. 1. The next shoe may then be readily raised into operating position in the machine. Initial movement of the lever 296 lowers the abutment 204 until it engages the heel portion of the shoe and then, under influence of further motion of the lever 296, the action of the remainder of the cam slot moves the abutment rearward in a path approximately parallel with the trimming plane of the knives 96.

When the abutment 204 is being thrust by power into firmer contact with the heel end, hinged wiping plates 302 (Fig. 5), in an arrangement somewhat similar to that disclosed in the patent issued to Roberts 2,287,275 are moved upwardly by power mechanism including a bracket 304 for contact with the toe portion adjacent to the lining members 46, 48. The plates 302 thereby assure that the upper will be held in its pulled-over condition during trimming and they are automatically lowered from the work at the end of a machine cycle.

It has been noted above that the beam 90 is suspended on the bell cranks 84, 86 for up and down motion with the reciprocable carriage 94. Reciprocation of the latter on the guideways 92 is provided by rods 304 (Fig. 2) which pivotally connect the carriage 94 with a power operated lever 306. The lever 306 is rocked about a fixed fulcrum as in the Elliott et al. machine referred to above by an eccentric 308 (Fig. 2) mounted on a power driven cam shaft 310. For oscillating the beam 90 up and down in timed relation with the reciprocation of carriage 94, a bell crank 312 is pivotally mounted on a pin 314 supported by the column B and one arm of the bell crank 312 carries a roll 316 engageable with a cam 318 also mounted on the shaft 310. The other arm of the bell crank 312 pivotally supports a block 320 slidably mounted on a rod 322 which is pivotally connected to an arm 324 of the bell crank 86. A spring 326 on the rod 322 is held in engagement with the block 320 by a nut and assures that a yielding upward thrust on the rod 322 and the beam 90 will be exerted by the bell crank 312.

Means are provided whereby the knives 96, when lowered by the beam 90 into their trimming plane for rearward operative movement, may be precisely adjusted heightwise relatively to the shearing faces of the blocks 12 and 14. A stop 328 (Fig. 2) is threaded into the beam 90 and when the latter is in its lower position the stop 328 engages a fixed stop 330 projecting from the head C. Rotation of the stop 328 accordingly adjusts the lower limit of the beam 90 heightwise and therefore the carriage 94 and knives 96 as well. To lock the knives in their operative

level against thrust which may be exerted upwardly by the work during trimming, the arm 324 (Fig. 2) of the bellcrank 86 carries a roll 334. A bell crank 336 pivotally mounted in the head C on a pin 338 is provided with a wedge face 340 formed eccentrically with respect to the pin 338. A rod 342 is connected to the bell crank 336 and carries a block 344 supported by a bell crank 346 mounted on the pin 314. The block 344 is urged upwardly by a spring 348. The bell crank 346 is actuated by a cam 350 mounted on the shaft 310 and is so timed relatively to the mechanism urging the knife carriage 94 rearwardly as to cause the face 340 to wedge beneath the roll 334 just as trimming is to commence. The spring 348 assures adequate wedging even though the roll 334 be slightly raised due to adjustment of the stop 328.

In operating the illustrative machine the toe portion of a shoe will be presented for engagement with the shear block assembly 10, the lining members 46, 48 having been suitably pivoted by means of the rod 44 to accommodate the contour of the toe. Inclined tops of the members 46, 48 will have been suitably adjusted heightwise of the shear faces of blocks 12, 14 to assure shearing of the depth desired. The shoe bottom will be held in engagement with the sole abutment 202 and insole engaging roll 208. On depressing the treadle 276 the shoe supporting roll 206 is raised to engage the toe and becomes locked in that position as described. Under control of the hand lever 296 the heel end abutment 204 descends from its inoperative position and moves rearwardly to clamp the shoe in trimming position. Further movement of the hand lever actuates clutch mechanism (not shown herein) whereby the heel end abutment further grips the shoe and the wiping plates 302 come into operation. The carriage 94 moves idly to the front of the machine in its elevated position, the outturning members 130 then making ineffective movements and the knives 96 rotating. The beam 90 lowers the carriage 94, knives 96, and outturning members 130 in their most forward position and the knives and other operating instrumentalities are then retracted along a generally inclined operating path parallel with that of the shear face of the blocks 12 and 14. The outturning members 130, rolls 200, and pressing fingers 182 lay the unsecured marginal material against the ears 76, the sloping tops of inner lining members 46, 48, and the shear faces of the blocks 12, 14, and are then raised to an elevated inoperative position by means of the cam rolls 154 and tracks 156. The knives 96 advance toe-ward in shearing relation to the outspread stock, the carriage 94 being effective to clear the operating path by removing the insole engaging roll 208 and also energizing the spring 228. At the end of the trimming stroke the beam 90 raises the knives 96 and the machine comes to rest as the spring 228 is permitted to return the roll 208 to its initial position for locating the next shoe to be trimmed.

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

1. In a toe lining trimming machine, a toe receiving bed adapted to support the toe portion of a partially fabricated shoe presented bottom up thereto, cutting means for trimming the lining of the shoe, a reciprocatory carriage supporting said cutting means for operative movement longitudinally of the shoe bottom, means for moving said carriage heightwise of the bed in time relation to

an operating stroke of the cutting means, and a member cooperative with the carriage moving means for locking said cutting means in operative level with the bed during said stroke.

2. In a toe lining trimming machine of the type provided with cutting means arranged to advance operatively along a shoe bottom toward the toe end and having power means for spreading unsecured marginal material outwardly of the toe portion ahead of the cutting means, a bed for embracing the toe comprising a rotary housing having a portion concentric with a vertical axis, a pair of articulated blocks having inclined shearing faces for supporting the outspread upper, members guided by said concentric portion for respectively pivoting the blocks about the housing axis, means for moving the members together or apart peripherally to position said shearing faces, arcuate members between the shoe toe and said blocks and respectively actuated by the last-mentioned means for pivotal movement therewith, and means for moving said arcuate members heightwise of the shearing faces for cooperation with said cutting means whereby different depths of margin trimming may be effected.

3. In a toe lining trimming machine of the type having a reciprocable carriage provided with cutting means arranged to advance toward the toe and along the shoe bottom in shearing relation with marginal upper material spread outward against a toe receiving block, movable insole engaging means arranged initially to limit the

heightwise position of the toe with respect to the block, a shoe supporting member movably mounted for cooperation with the insole engaging member to clamp the toe in its heightwise operative position, means actuated by said carriage for subsequently moving said insole engaging means out of the path of the cutting means and out of contact with the shoe, and means for locking the member in clamping position when the insole engaging means is so removed.

4. In a toe lining trimming machine of the type having a reciprocable carriage provided with cutting means arranged to complete an operating cycle by being elevated from a shoe bottom after advancing toe-ward in shearing relation with marginal upper material spread outward against a toe receiving block, a shoe supporting member and an insole engaging roll cooperative initially in the cycle to position and clamp the shoe heightwise of the block, said roll being retractably mounted for movement by said carriage out of the operating path of said cutting means, and means energized by retraction of said roll, said energized means being rendered operative on completion of the cycle to return the roll for positioning engagement with the next shoe to be trimmed.

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No references cited.