Aug. 12, 1958 E. QUINN 2,846,702

HEEL END LASTING MECHANISMS

Original Filed Nov. 9, 1951 9 Sheets-Sheet 1

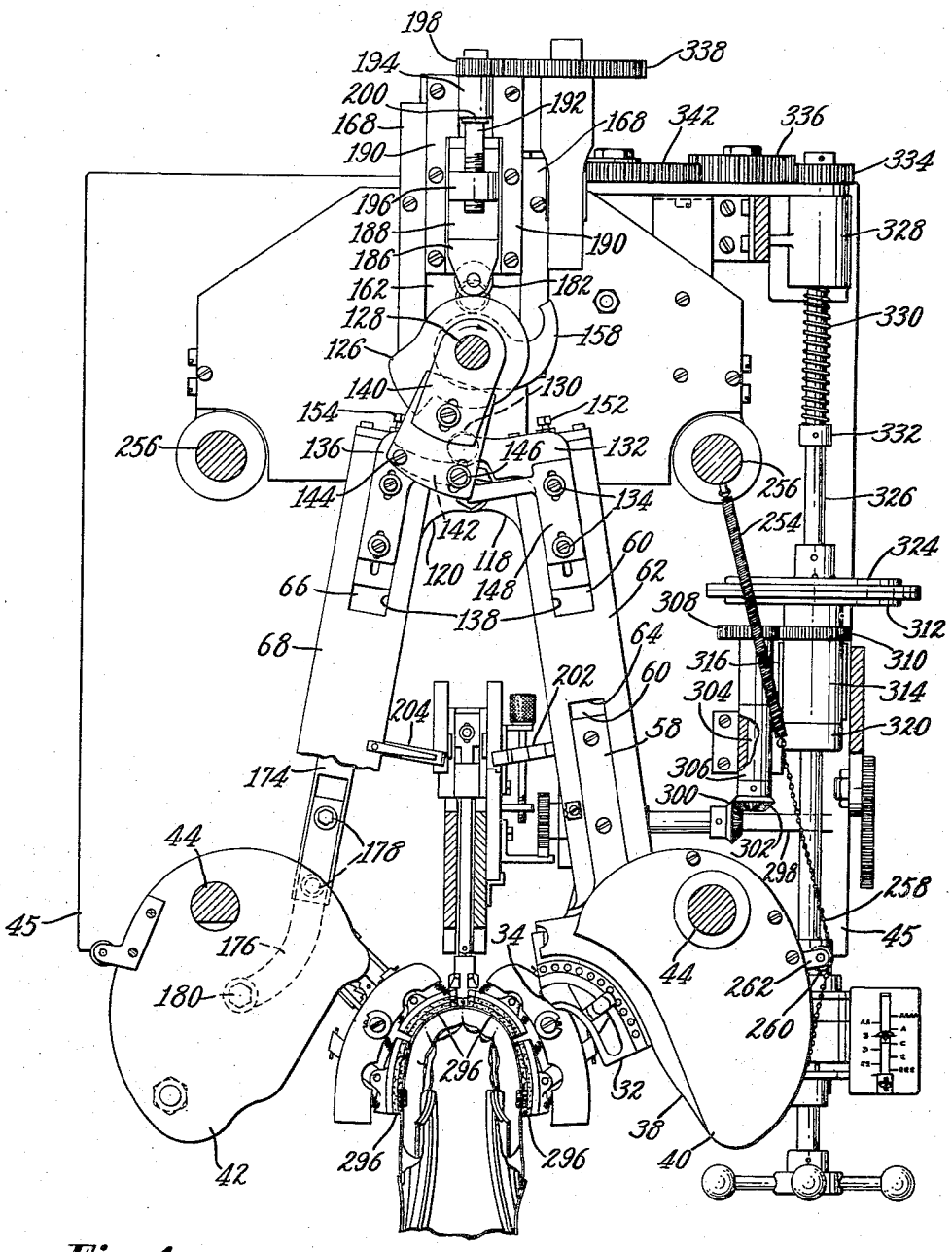


Fig. 1

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By his Attorney

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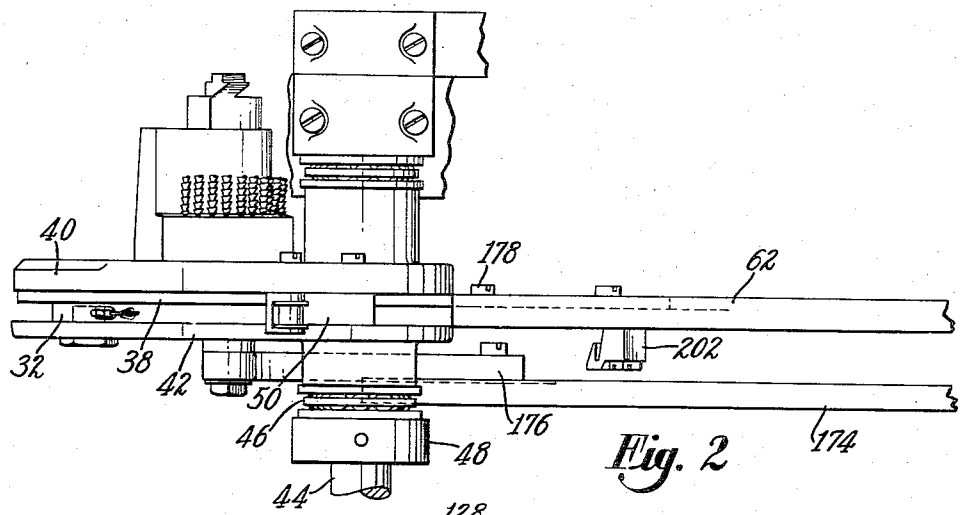


Fig. 2

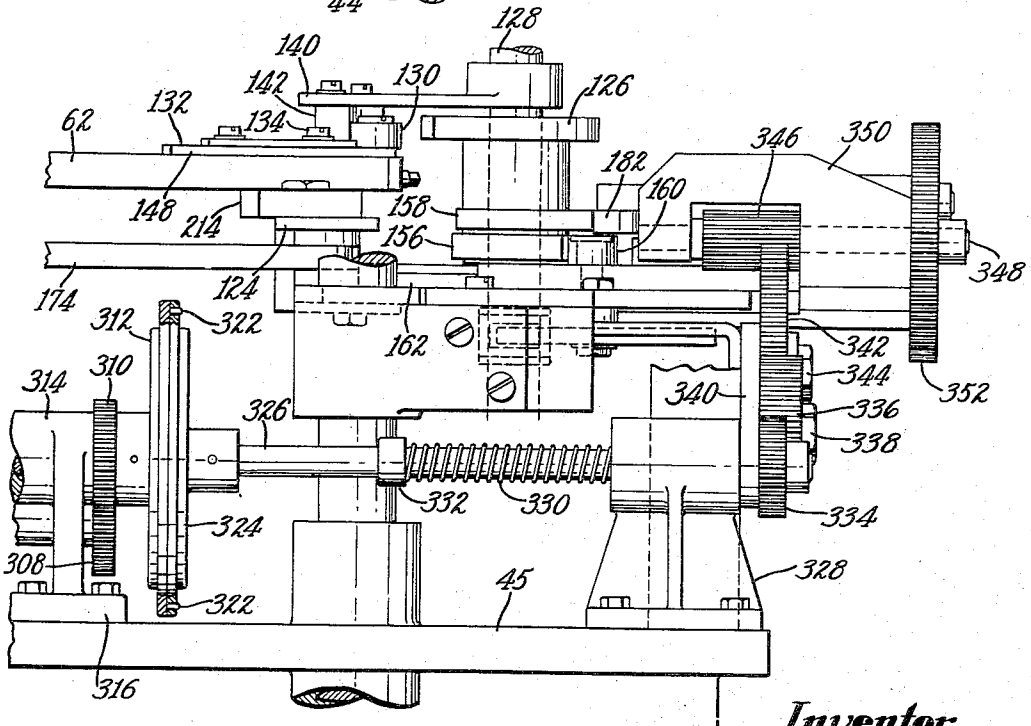


Fig. 3

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Original Filed Nov. 9, 1951 9 Sheets-Sheet 3

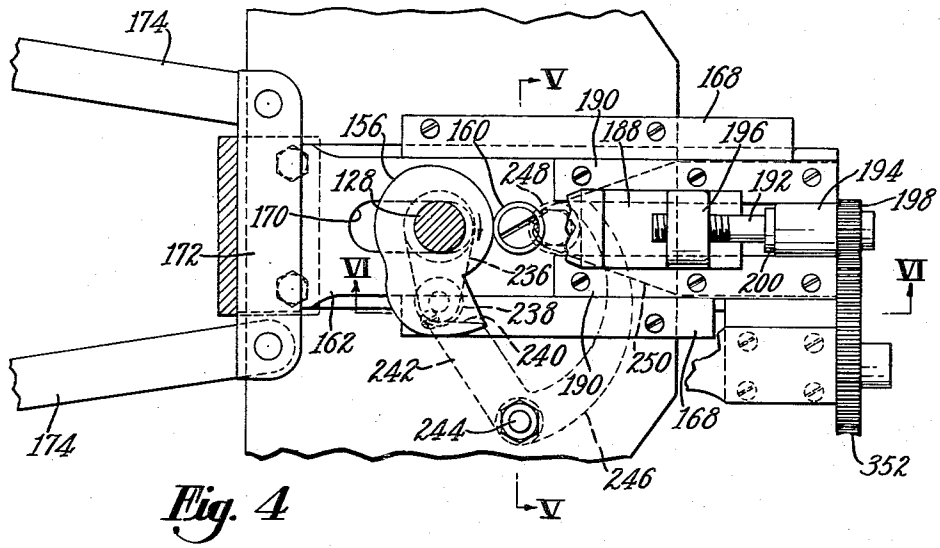


Fig. 4

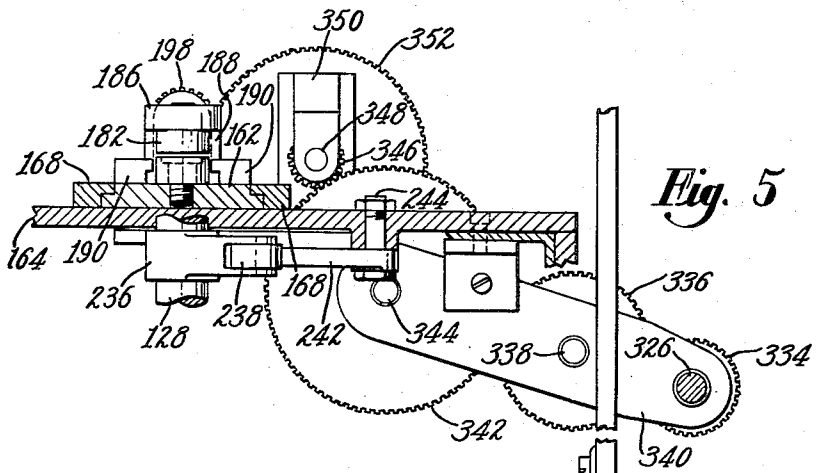


Fig. 5

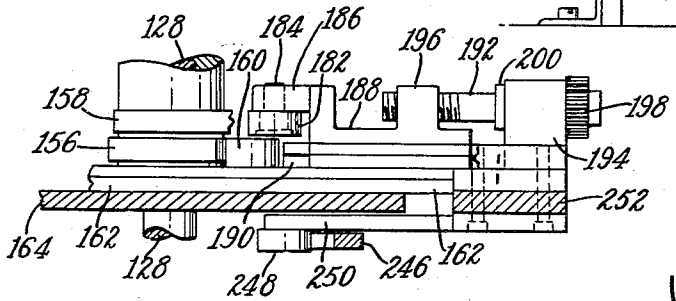


Fig. 6

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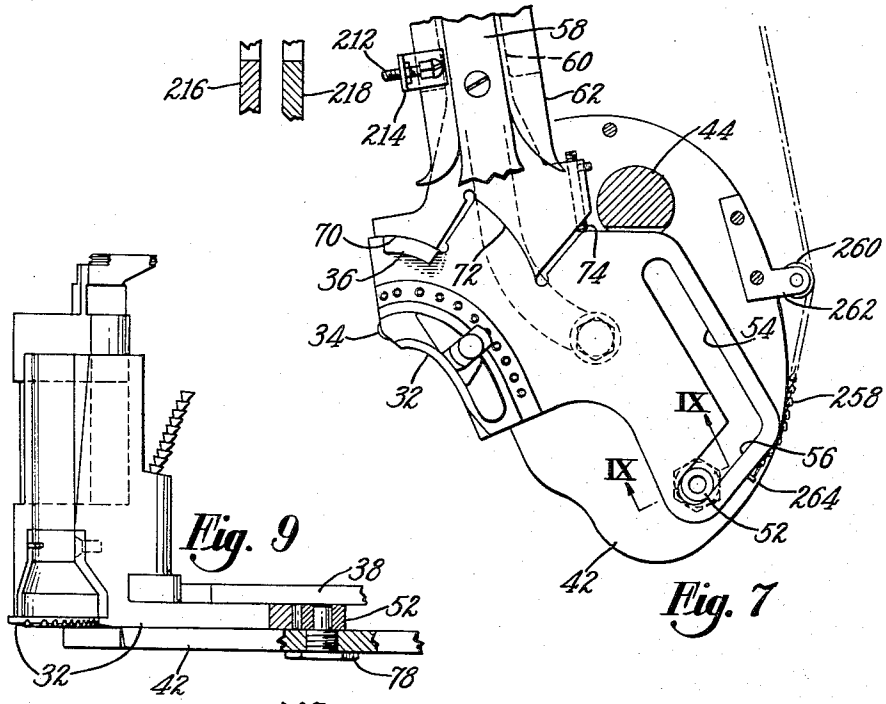


Fig. 7

Fig. 9

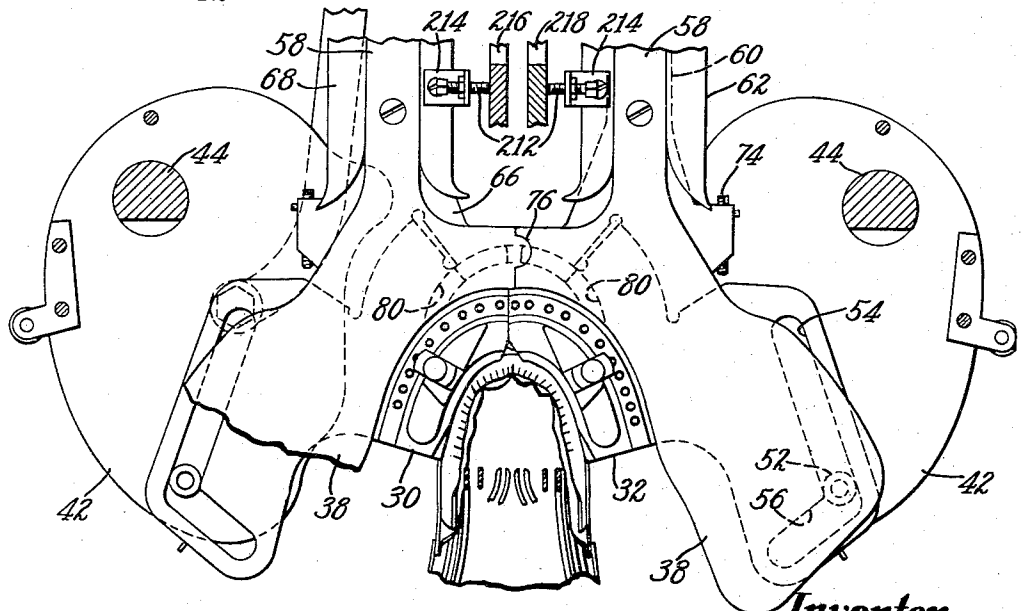


Fig. 8

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HEEL END LASTING MECHANISMS

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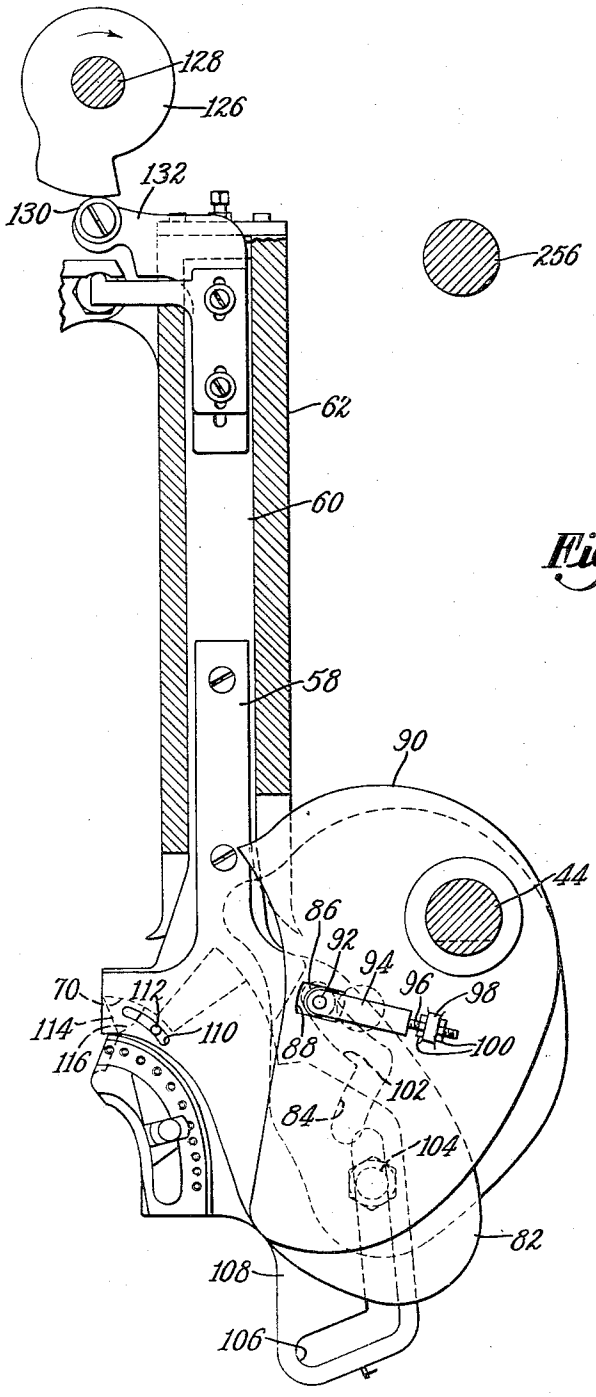


Fig. 10

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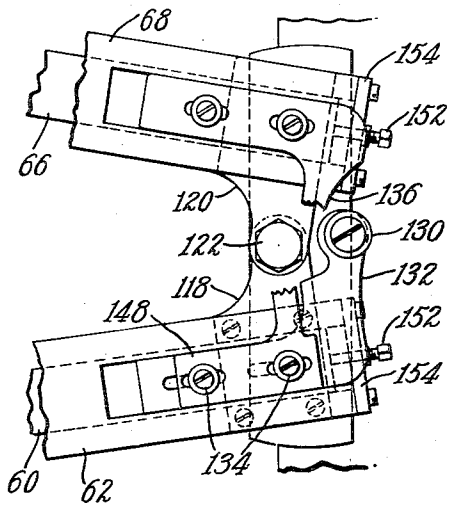


Fig. 11

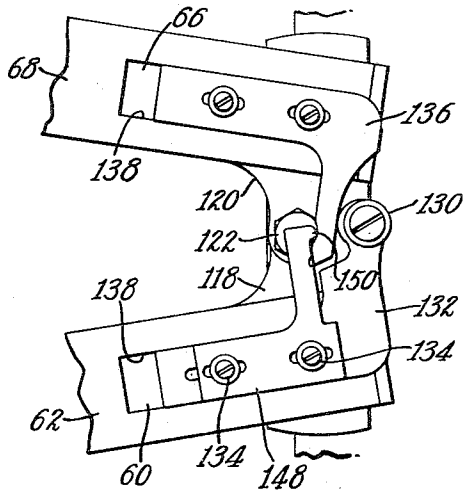


Fig. 12

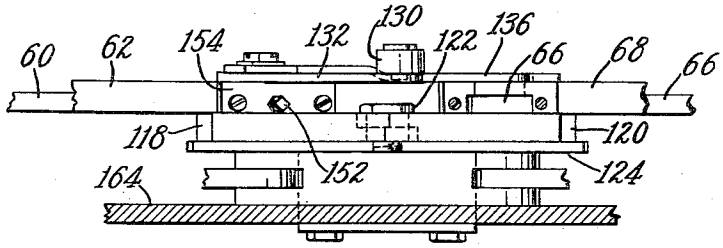


Fig. 13

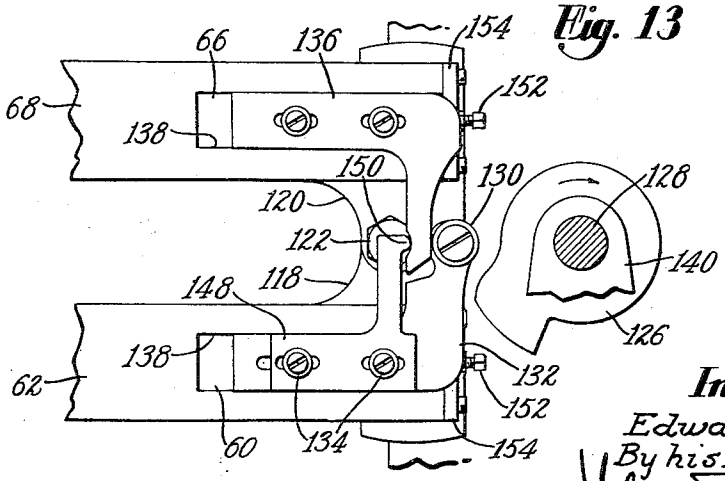


Fig. 14

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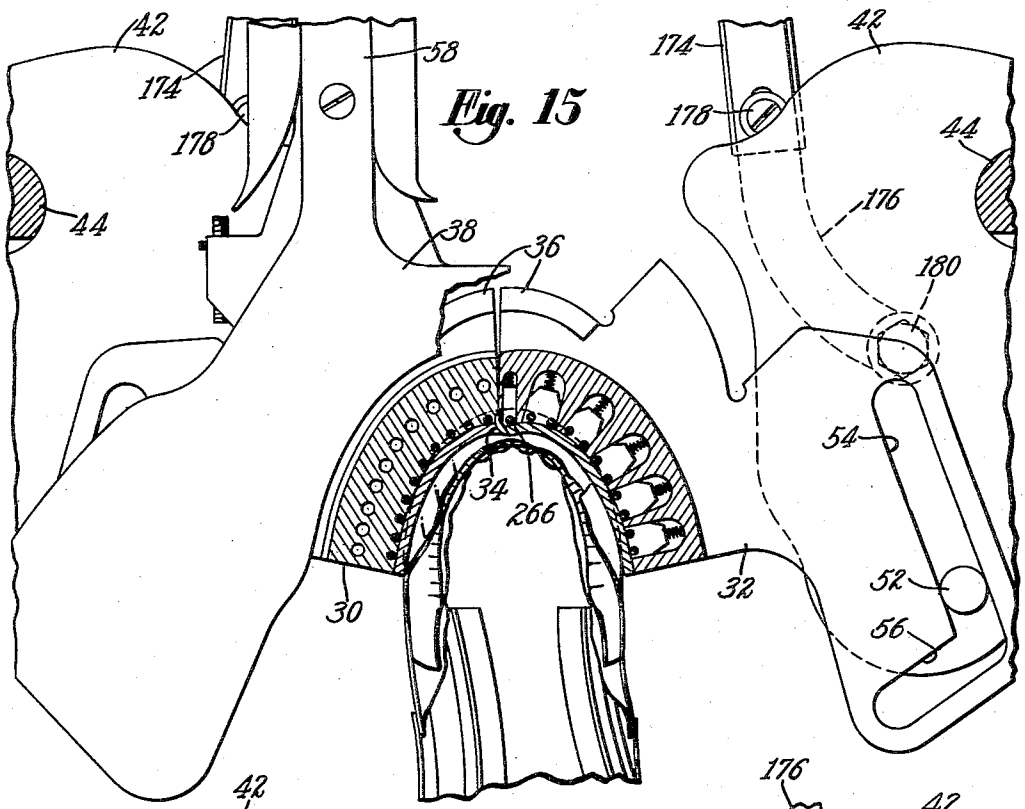


Fig. 15

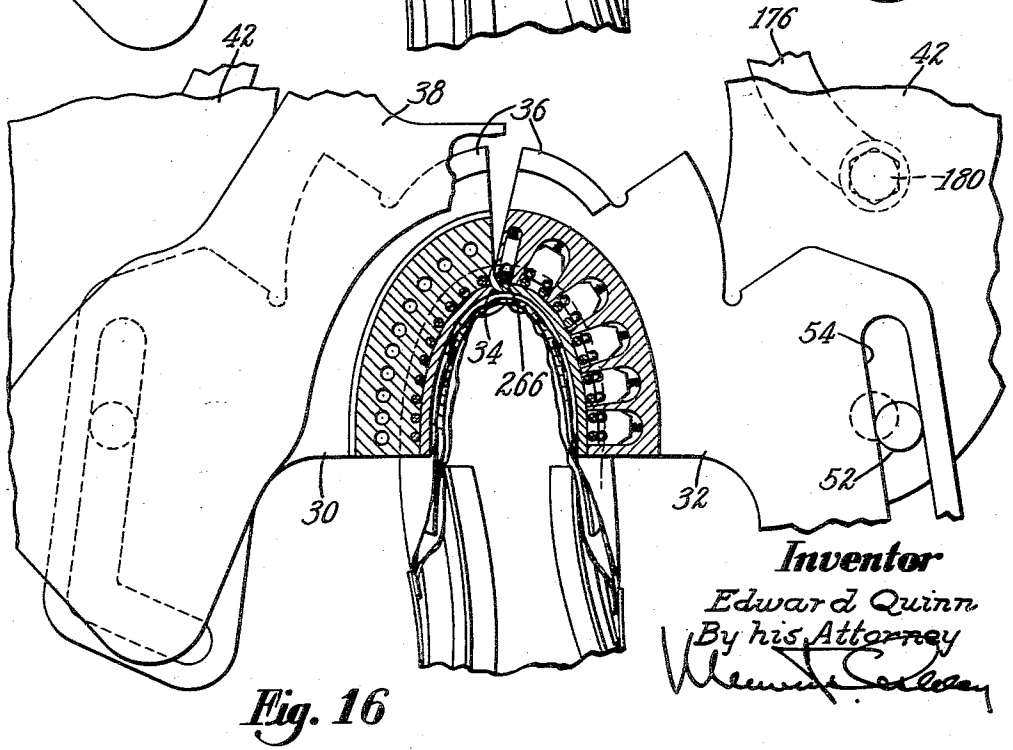


Fig. 16

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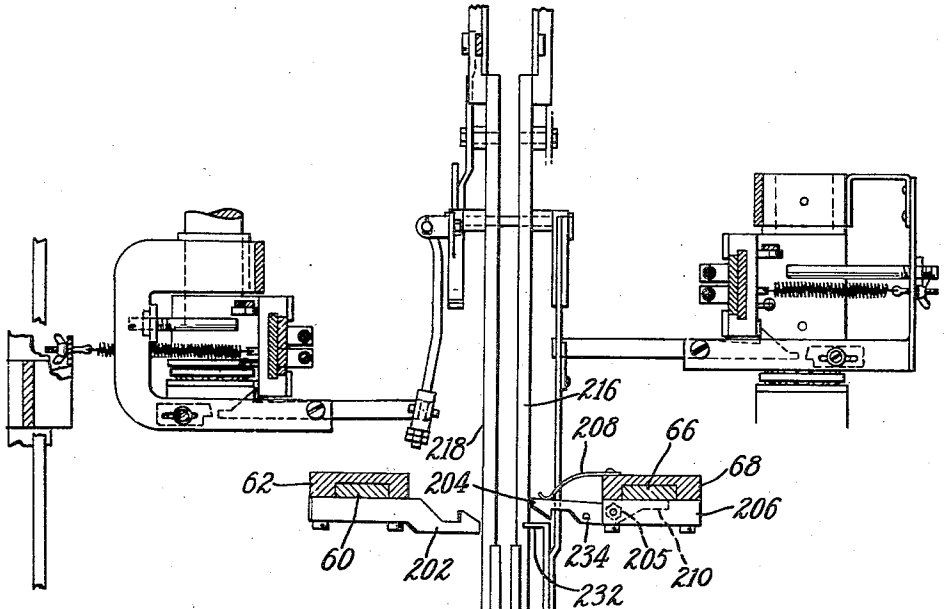
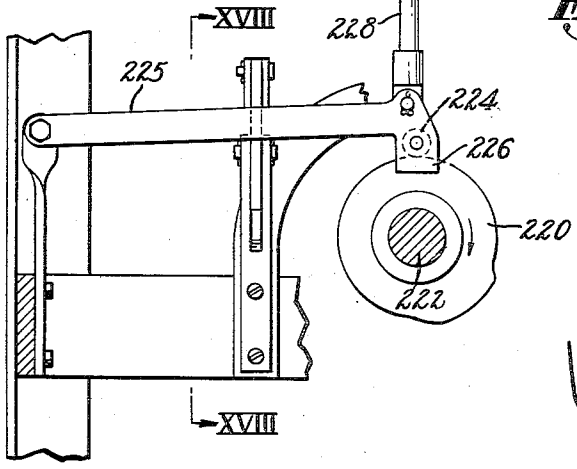


Fig. 17



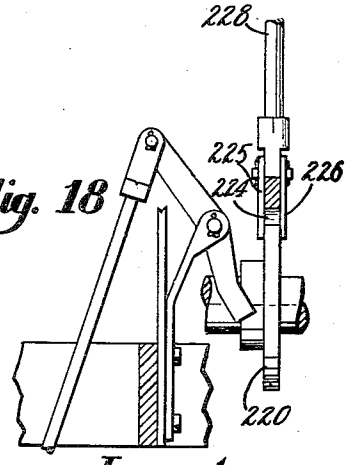


Fig. 18

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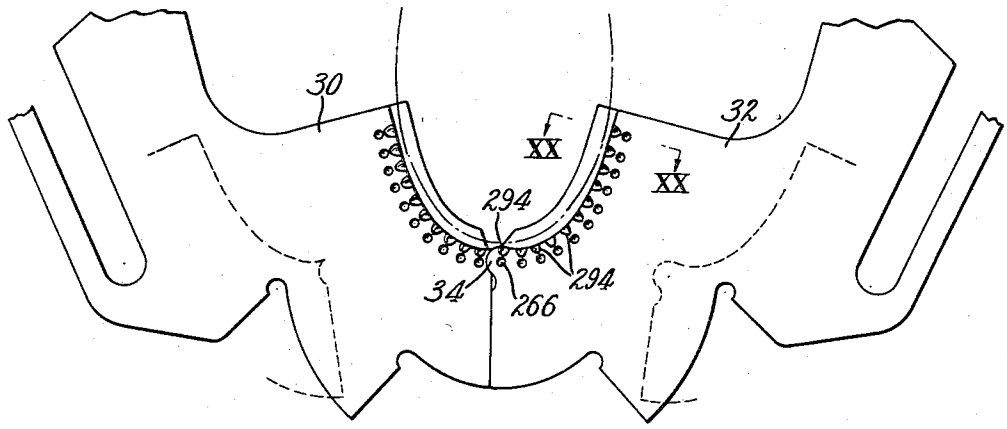


Fig. 19

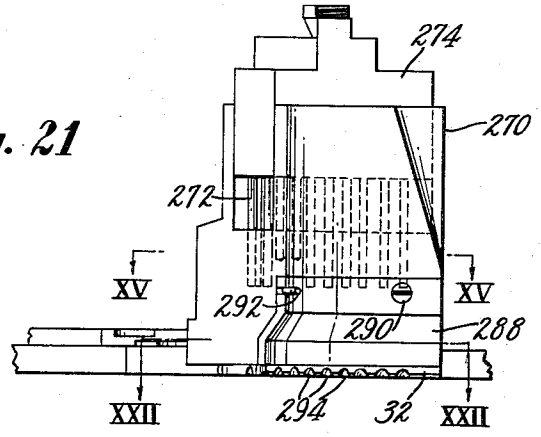


Fig. 21

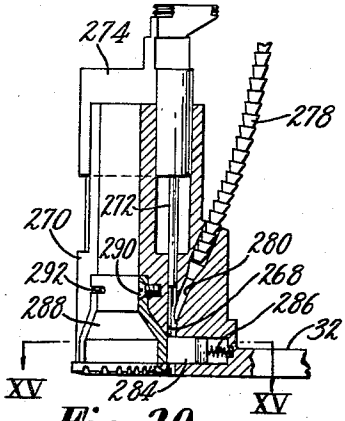


Fig. 20

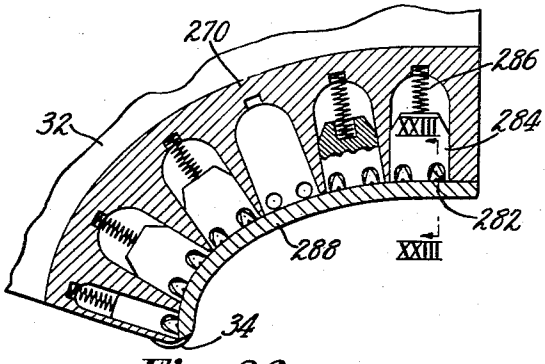


Fig. 22

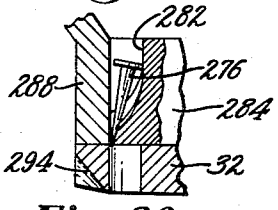


Fig. 23

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United States Patent Office

2,846,702

Patented Aug. 12, 1958

2,846,702

HEEL END LASTING MECHANISMS

Edward Quinn, Saugus, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Original application November 9, 1951, Serial No. 255,673, now Patent No. 2,740,138, dated April 3, 1956. Divided and this application January 17, 1955, Serial No. 481,998

55 Claims. (Cl. 12—12.3)

The present invention relates to shoe upper shaping mechanism and is a division of United States Letters Patent No. 2,740,138, granted April 3, 1956, on an application filed in my name. The invention is herein illustrated in its application to machines for lasting the heel end portions of shoe uppers but it is to be understood that the invention is not limited to heel end lasting machines, the invention in certain aspects thereof being applicable to lasting machines generally.

It is an object of the present invention to provide shoe upper shaping mechanism which will cooperate with other mechanisms disclosed in my Patent No. 2,740,138 above referred to, to prepare the rear portions of shoes for operations subsequent to the operation of the machine illustrated in my patent No. 2,740,138 so that the breast line portions of the shoe upper materials, particularly the marginal materials at the edge of the shoe bottom, are located with precision and uniformity to the end that the shoe bottom materials at opposite sides of the breast line portion of a given shoe are exactly alike as to their disposition on the last, and further to the end that the breast line portion of each shoe will duplicate exactly the breast line portion of every other shoe on the rack as to the disposition of the shoe materials on the last. Such preparation of the rear parts of shoes opens a field for certain types of automatic machines which heretofore have not been commercially useful because there has been no commercially practicable way of preparing the work for the operation of such automatic machines. Machines of this type include automatic side lasting machines such as that disclosed in United States Letters Patent No. 2,201,866, granted May 21, 1940, on an application filed in the name of Robert H. Lawson, and automatic sewing machines for forming the inseam and attaching the welt in a Goodyyear welt shoe. An automatic sewing machine of this type is disclosed in United States Letters Patent No. 2,359,662, granted October 3, 1944, on an application filed in the name of A. R. Morrill.

With the above and other objects in view, as will hereinafter appear, the present invention in one aspect thereof comprises a shoe upper lasting organization consisting of a pair of end embracing lasting wipers which, in the illustrated machine, operate on the heel end of the shoe, a pair of carriers in which the lasting wipers are mounted, means herein illustrated as a power operated cam mechanism for actuating the carriers first to move the wipers into contiguous relation to each other and then to effect relative angular movement of the wipers in order to cause the wipers to wipe the lasting margin at one end of a shoe in the machine in over an insole on a last bottom. In the illustrated organization the wipers are constructed and arranged for separable articulation at their common axis of angular movement by the provision of a lateral projection of one wiper which operates in a complementally shaped recess formed in the other wiper. The movement of the wipers away from each other provides clearance for the operation of other instrumentalities illustrated and described in my patent No. 2,740,138 above referred to, such other instrumentalities including grippers for tensioning the heel end portion of a shoe upper over a last. The lasting wipers are supported on two members which are mounted for angular movement on posts arranged at opposite sides of the machine and the angular movement of said members is employed in connection with angular overwiping movements of the wipers. To this end said members carry rolls constructed and arranged to operate against cam surfaces formed in the wipers respectively. In order to hold the wipers in articulated relation to each other during the wiping operation means herein illustrated as a latch is provided for positively holding the wiper carriers against relative movement away from each other. After the completion of the wiping operation the latch is automatically released to permit the carriers to move the wipers away from each other and out of their mutually articulated position. The movement of the wipers into articulated position is effected by means herein illustrated as a cam which imparts angular movement to the members which support the wiper carriers. Means herein illustrated as a second cam imparts further angular movement to said members in the performance of the wiping operation. Means herein illustrated as a third cam advances the wipers toewardly relatively to the supporting members to overwipe the back line portion of the upper. Upon the completion of the wiping operations means herein illustrated as a fourth cam retracts the wipers relatively to the supporting members and thereafter the members are swung about the posts on which they are mounted to return the wiper assemblies to their rest positions.

In an alternative construction of the wiper operating mechanism the latch for holding the wipers in their articulated position is omitted and the wipers are held against separation by connections between the wiper supporting members and the wipers, said connections in the illustrated organization including a roll carried by each of the supporting members and arranged to act against the wiper. In order to cause the wipers to register accurately with each other in their articulated position means is provided for adjusting the rolls carried by the wiper supporting members thereby to vary the positions of the wipers relatively to each other widthwise of the shoe.

In order to facilitate the removal of a wiper from its supporting member and the substitution therefor of another wiper of a different size or style, the wiper actuating roll mounted in the supporting member is pivotally mounted on a pin which is constructed and arranged to be removed from the supporting member in order to permit the wiper and the roll to be removed from the supporting member. Before inserting another wiper into the supporting member the roll is mounted in a slot provided therefor in such other wiper and is advanced into the supporting member along with the wiper. In order to provide for the adjustment of the lasting wipers for operation on different sizes of shoes within the range of sizes, for which the wiper is constructed, two actuators herein illustrated as cams, are provided for advancing the wipers. The first cam imparts an invariable wiping movement to the wiper and the second cam operates after the completion of the advancement of the wiper by the first cam to impart a variable wiping movement thereto. In the illustrated organization the second cam engages a roll carried by a slide which is adjustable to move the roll toward and from the cam. The slide is adjusted by the manual operation of a screw which rotates in the slide and is suitably held against bodily movement.

In the heel end lasting operation the heel end wipers

gather the fullness in the lasting margin and lay it in pleats on the insole. In order to insure the location of the pleats in positions in which they will be secured by the lasting tacks the present invention contemplates the formation in the lasting margins of the wipers of a plurality of grooves extending inwardly from the wiping edge in alinement with the apertures through which the tacks are driven, each groove terminating between the wiping edge and the adjacent aperture in order to permit the pleat formed in the groove to be ironed out flat beneath the aperture through which the tack is driven.

These and other features of the invention will now be described with reference to the accompanying drawings and pointed out in the appended claims.

In the drawings,

Fig. 1 is a plan view illustrating a heel end lasting organization incorporating the features of the present invention;

Fig. 2 is a right side elevation of the right-hand wiper assembly illustrated in Fig. 1;

Fig. 3 is a right side elevation illustrating parts of the mechanism for operating the heel end wipers;

Fig. 4 is a plan view of the mechanism shown in Fig. 3;

Fig. 5 is a section taken substantially on the line V—V of Fig. 4;

Fig. 6 is a section taken on the line VI—VI of Fig. 4;

Fig. 7 is a plan view illustrating parts of the heel end wiper assembly at the right side of the machine;

Fig. 8 is a plan view showing the heel end wipers in their relative position at the beginning of their overwiping movement;

Fig. 9 is a front elevation of the right-hand wiper assembly shown in Fig. 7, partly in section, on the line IX—IX of Fig. 7;

Fig. 10 is a plan view similar to Fig. 7 showing an alternative construction;

Fig. 11 is a plan view of parts of the heel end wiper operating mechanism, certain mechanism being broken away to illustrate underlying parts;

Fig. 12 is a plan view of the heel end wiper operating mechanism illustrating parts omitted from Fig. 11;

Fig. 13 is a rear elevation illustrating the mechanism shown in Fig. 11;

Fig. 14 is a plan view similar to Fig. 12 showing the parts at a later stage in the machine cycle;

Fig. 15 is a plan view showing the wiper assemblies in their relative positions shown in Fig. 8 the wiper unit at the left being shown in section on the line XV—XV of Fig. 21 and the wiper unit at the right being shown in section on the line XV—XV of Fig. 20;

Fig. 16 is a plan view similar to Fig. 15 showing the wipers at the limit of their overwiping movements;

Fig. 17 is a rear elevation illustrating parts of the heel end lasting mechanism;

Fig. 18 is a section taken on the line XVIII—XVIII of Fig. 17;

Fig. 19 is a bottom view of the heel end lasting wipers in their articulated position;

Fig. 20 is a section taken on the line XX—XX of Fig. 19;

Fig. 21 is a side elevation of the wiper and tacker unit at the right side of the machine;

Fig. 22 is a section taken on the line XXII—XXII of Fig. 21; and

Fig. 23 is a section taken on the line XXIII—XXIII of Fig. 22.

As illustrated in the drawings, the present invention is embodied in a machine of the type shown, for example, in my Patent No. 2,740,138 hereinbefore referred to. Machines of this type are provided with means for supporting a lined shoe upper in inverted position by engagement with its back line portion, automatic means for inserting a molded counter into the heel end portion of a supported upper, means for bringing the quarter lining into intimate contact with a counter positioned in the upper, and gripper mechanism for tensioning the breast line portion of the upper upwardly, toewardly and inwardly over an insole on the bottom of a last which is inserted into the supported upper after the lining is brought into contact with the counter. Suitable heel pads are provided for clamping the heel end portion of the upper against the last in order to maintain the tension imparted to the upper by the breast line grippers and thus to hold the heel portion of the upper in position for the operation of mechanism hereinafter described for performing a lasting operation thereon.

For wiping the lasting margin at the heel end portion of the upper inwardly over an insole on the last bottom the illustrated machine is provided with a pair of wipers **30** and **32** (Figs. 15 and 16). These wipers swing or hinge on a common center adjacent to the back line of the upper to overwipe the lasting margin at opposite sides of the heel portion of the upper and advance bodily toewardly to overwipe the lasting margin at the extreme heel end of the upper. To provide for mutual articulation of the wipers at the hinging point the wiper **32** has a lateral projection **34** extending to the left as seen in Fig. 16 for engagement in a complementally shaped recess in the left wiper **30**. The lateral projection **34** is characterized by an arcuate edge face which is slightly less than semi-circular in extent and therefore is separable from the complementally shaped recess in the left wiper **30**. The lateral projection **34** is so constructed and arranged that the meeting edges of the wipers at the point of articulation are centrally spaced between the adjacent tack holes in the margins of the wipers. It will be understood that the center of curvature of the projection **34** is the common axis on which the wipers swing. The center of said projection is also the common center of two arcuate tongues **36** extending upwardly from the rear end portions of the wiper plates for sliding engagement in arcuate grooves formed in a pair of wiper carriers or plates **38** arranged in contiguous relation to the top surfaces of the wiper plates. Referring to Fig. 2, the grooved plates and the wiper plates are confined between top plates **40** and base plates **42** comprising two wiper supporting assemblies freely mounted for angular movement on posts **44** (Fig. 1) mounted in and extending upwardly from a table **45**. The right wiper supporting assembly is held against downward movement by a thrust bearing **46** (Fig. 2) mounted on the post **44** and supported by a collar **48** fixed to the post, and the left wiper supporting member is similarly upheld. The plates **38** overlie the greater part of the area of the wiper plates and prevent any vertical play between the wiper plates and the plates **40** and **42**. At their outer margins the plates **40** and **42** are secured to spacer members **50** having a thickness corresponding substantially to the combined thickness of the grooved plates and the wiper plates. In the operation of the machine the plates **40** and **42** are swung inwardly as a unit to actuate mechanism for effecting the mutual closing movements of the wipers, and the grooved plates **38** are moved toewardly thereby to advance the wipers bodily to perform the overwiping operation at the extremity of the heel portion of the shoe. Referring to Fig. 15, the mechanism for imparting closing movement to the wiper plate at the right side of the machine comprises a roll **52** carried by the base plate **42** and arranged to operate in an angular slot formed in the wiper plate and having a relatively long section **54** extending generally lengthwise of the shoe in the machine and a relatively short section **56** extending widthwise of the shoe with a toeward inclination. When the machine is in its rest position, as shown in Fig. 1, the wiper plates are separated from each other widthwise of the machine in order to provide clearance for the operations of instrumentalities including the back line wiper mechanism, and the roll **52** (Fig. 15) is located adjacent to the end of the short portion **56** of the slot. In the operation of

the wiper mechanism the plates **40** and **42** are swung inwardly first to bring the wiper plates into their articulated position shown in Fig. 15 and then to close the wiper plates into their overwiped position shown in Fig. 16. During the movement of the wipers into their articulated position relative movement of the wiper plate and the roll **52** positions the roll at the apex of the angle defined by the two sections **54** and **56** of the slot. During the closing movement of the wipers the roll moves relatively to the long portion **54** of the slot into its position shown in Fig. 16. This position of the roll relatively to the slot will vary with differences in the degree of closing movement and toeward movement of the wipers. Referring to Fig. 1, the grooved plate **38** at the right side of the machine has a rearwardly extending shank portion **58** secured to a slide **60** mounted in a guideway in a carrier **62**, the forward portion of which has an open ended slot **64** which provides clearance for the movements of the shank portion **58** of said plate **38**. The grooved plate at the left side of the machine is mounted on a slide **66** similar to the slide **60** and the slide **66** is mounted in a carrier **68** similar to the carrier **62**. In order to effect bodily toeward movement of the wipers the slides **60** and **66** are advanced concomitantly by mechanism hereinafter described. Referring to Fig. 7 the slide **60** has a relatively wide forward portion in which there is formed an arcuate concave abutment surface **70** constructed and arranged to engage the arcuate convex rear surface of the tongued portion **36** of the wiper plate. Also formed in the slide **60** is an arcuate concave abutment surface **72** constructed and arranged to engage a complementally shaped edge face of the wiper plate offset rearwardly and outwardly from the tongued portion of the wiper. Said abutment surfaces are concentric to the common center of closing movement of the wiper plates. The retracted position of the wiper plate at the right side of the machine, shown in Fig. 7, is determined by the engagement of its rear edge face with the forward end of an abutment screw **74** mounted in a tapped hole in a lateral extension of the forward portion of the slide **60**. In order to cause the plates **38** to register accurately with each other when the wipers are brought into hinging position the plate at the left side of the machine is provided with an ear **76** (Fig. 8) having a semicircular edge face and the plate at the right side of the machine is provided with a recess having a shape complemental to said ear and arranged to receive the ear when the wiper assemblies are advanced into their hinging position shown in Fig. 8.

In order to facilitate the removal of either wiper from the machine for repair or replacement the roll **52** is mounted on the reduced upper end portion of a headed screw **78** (Fig. 9) mounted in a tapped hole in the base plate **42**. The head of the screw engages the bottom of the base plate and is positioned near the forward end thereof and readily accessible by the operator. When it is desired to remove either wiper from the machine the screw **78** is removed from the base plate **42** and the wiper plate, together with the roll **52**, are slid forwardly between the base plate **42** and the overlying plate **38**. As shown in Fig. 8, the arcuate grooves **80** in the plates **38** are extended to the inner edge faces of the plates, respectively, to permit the tongues in the wipers to move freely out of said grooves. Preferably the machine is in its rest position with the roll at the forward end of the short portion of the slot in the wiper plate, as shown in Fig. 7, when the wiper is removed from the machine. In mounting said wiper or a replacement therefor in the machine the roll is located at the forward end of the slot as shown in Fig. 7, and the wiper is advanced between its supporting plates with the roll in this position until it is located in correct relation to said plates. The roll may then be accurately positioned to receive the screw **78** by means of a blunt pointed tool inserted through the tapped hole in the base plate.

In Fig. 10 there is illustrated an alternative wiper assembly which differs from the assembly above described in the construction of the top plate and a plate lying between it and the wiper and identified by the numeral **82**. There are also minor modifications in the construction of the wiper plates. The plate **82** is provided with an angular slot **84** in which is mounted a roll **86** which extends upwardly from said slot into a short rectilinear slot **88** in a top plate **90** corresponding generally to the top plate **40** above described. The roll **86** is mounted on a pin **92** mounted in and projecting downwardly from the left end portion of an arm **94**. Fixed in and projecting from the right end of said arm is a threaded rod **96** which extends freely through a bore in a lug **98** projecting upwardly from the top plate **90**. Two lock nuts **100** on the threaded rod secure the arm **94** in predetermined relation to the lug and hold the roll **86** against movement longitudinally of the slot **88**. The slot **88** extends generally widthwise of the machine, its angular disposition being such that it never comes into a position in which its side walls are coplanar to the side walls of the slot **84**. When it is desired to vary the degree of the overwiping movement of the wipers at the extreme heel end of the shoe the lock nuts **100** are released to permit a slight movement of the roll **86** through the slot **88** whereupon the plate **82** is manually adjusted forwardly or rearwardly as required. Preferably this adjustment is made after the machine has come to rest at the end of the second third of the machine cycle. At this time the wipers have moved inwardly into their articulated position and are ready for the overwiping operation which occurs at an early stage in the last third of the main cycle. If, after making the above adjustment the wiper plates are slightly separated from each other at the point of articulation the arm **94** and the corresponding arm at the left side of the machine are moved toward each other in order to bring the wiper plates into articulated position. The lock nuts **100** are then tightened against the lug **98** in order to secure the arm **94** in adjusted position, and the corresponding arm at the left side of the machine is similarly secured. The rear portion **102** of the slot **84** is made concentric to the post **44** in order that the roll **86** and the companion roll in the left wiper assembly (not shown) may serve to hold the wipers in articulated position while they advance to wipe the lasting margins of the upper and the lining inwardly over an insole on the last bottom.

In the operation of the machine the roll **86** moves from the forward end of the slot to the rear end thereof. During the movement of the wipers into articulated position the roll and the slot move relatively to each other to cause the roll to be positioned at the bend of the slot at the same time a roll **104** in an angular slot **106** in a wiper plate **108** is positioned at the bend in its slot. During the closing movement of the wiper plates the rolls move relatively to their slots until they come to rest in their respective positions shown in Fig. 10. In place of the tongue **36** and groove **80** in the wiper assembly illustrated in Figs. 7 and 8 the plate **82** illustrated in Fig. 10 is provided with an arcuate slot **110** having its center of curvature at the axis on which the wiper plate swings and a pin **112** is mounted in the wiper plate **108** and arranged to project upwardly therefrom through said slot. In order to cause the wiper plate **108** to register accurately with its companion wiper plate (not shown) when said plates come into their articulated position, the illustrated wiper plate is provided with a pointed ear **114** which is reduced in thickness by cutting away its top portion as far as a shoulder **116**. The rear edge face of the ear is in the form of an arc concentric to the slot **110** and its forward edge face is bilaterally symmetrical to the shoulder **116**. A similar ear formed in the companion wiper plate overrides the ear **114** and comes to rest with its leading edge face in abutting relation to the shoulder **116** and its rear edge face in abutting relation to the arcuate face **70** of the slide **60**.

Referring to Fig. 11, the rear portions of the carriers **62** and **68** have secured to their bottom faces arms **118** and **120**, respectively, arranged to extend inwardly therefrom and forming at their inner ends a halved joint (Fig. 13) through which extends a headed pin **122** the threaded lower portion of which is mounted in a tapped hole in a fixed horizontal plate **124**. For advancing the slides **60** and **66** forwardly to cause the wiper plates to wipe the lasting margin at the extreme heel end of the shoe inwardly and toewardly over an insole on the last bottom a cam **126** (Fig. 14) is fixed to a vertical cam shaft **128** and arranged to engage a roll **130** carried by an angle arm **132** secured by two screws **134** to the rear portion of the slide **60**, said roll being positioned centrally between the rear ends of the two slides. The arm **132** is slotted to receive the screws **134** and is adjustable longitudinally of the slide **60** in order to vary the extent of the forward movement of the slides and therefore the degree of toeward overwiping movement of the wiper plates. The slide **66** moves forwardly concomitantly with the slide **60** by reason of the engagement of the roll **130** with the laterally extending portion of an angle arm **136** fixed to the slide **66** and adjustable thereon in the same manner as the arm **132**. The angle arms **132** and **136** are oriented by the engagement of their opposite side faces with the side walls of open ended slots **138** formed in the carriers **62** and **68**, respectively. For moving the slides **60** and **66** rearwardly into their rest positions a cam member or arm **140** (Fig. 1) is fixed to the vertical cam shaft **128**, said arm having secured to its bottom surface a cam plate **142** the rear edge face of which is arranged to engage the roll **130**. The cam plate is mounted for angular adjustment on a fulcrum **144** and is secured in adjusted position by a clamping screw **146** extending downwardly through a slot in the arm **140** and into a tapped hole in the free end portion of the cam plate. In order to cause the slide **66** to move rearwardly concomitantly with the slide **60** an angular arm **148** is fixed to the slide **60** by the screws **134**. The laterally extending portion of said arm **148** has an ear **150** (Figs. 12 and 14) projecting rearwardly from its end portion and located centrally between the slides. Said ear engages an arcuate concavity formed in the arm **136** during the rearward movement of the slide **60**. For preventing excessive rearward movement of the slides **60** and **66** manually when the machine is at rest abutment screws **152** (Fig. 11) are mounted in plates **154** fixed to the rear ends of the carriers **62** and **68**, respectively, and arranged to abut the rear end faces of the slides, respectively.

For imparting closing movements to the wiper plates in order to wipe the lasting margins at opposite sides of the heel portion of the shoe inwardly widthwise of the shoe over an insole on the last bottom the illustrated machine is provided with two cams **156** (Fig. 4) and **158** (Fig. 1) both fixed to the vertical cam shaft **128**. The cam **156** imparts a predetermined and invariable closing movement to the wiper plates and the cam **158** supplements the action of the cam **156** and imparts to the wiper plates the latter part of their closing movements the extent of which is variable by the adjustment of mechanism hereinafter described. The cam **156** acts against a roll **160** (Fig. 6) carried by a slide **162** mounted on a platform **164** and guided by gibs **168** (Fig. 4) fixed to the platform, the slide **162** being centrally positioned widthwise of the machine. The slide is provided with a longitudinal slot **170** to provide clearance for the cam shaft **128**, said slot being long enough to provide for the operating movement of the slide. At its forward end the slide has fixed thereto a crosshead **172** to the opposite ends of which are pivoted two links **174**. At its forward end each link is longitudinally grooved to receive an outwardly bent arm **176** (Fig. 15) which is secured thereto by clamping screws **178**. At its forward end the arm **176** is pivotally mounted on a headed screw **180** projecting downwardly from the base plate **42**. It will be seen that rearward movement of the links **174** by the successive operations of the cams **156** and **158** causes the wiper carrying plates to swing inwardly on the posts **44** thereby to impart closing movements to the wiper plates. Referring to Fig. 6, the cam **158** operates against a roll **182** pivotally mounted on a headed pin **184** projecting downwardly from the upwardly offset forward portion **186** of a slide **188** mounted on the upper surface of the slide **162** and guided thereon by gibs **190** fixed to the slide **162** and having flanges positioned in longitudinal grooves extending inwardly from the opposite side faces of the slide **188**. In order to adjust the roll **182** toward or from the cam **158** in accordance with the width of the shoe to be operated upon the slide **188** is adjusted by the operation of a shaft **192** journaled in a bearing in a boss **194** formed in and projecting upwardly from the rear portion of the slide **162**. The forward portion of the shaft is threaded for operating engagement in a tapped hole in a lug **196** projecting upwardly from the slide **188**. The shaft is held against endwise movement relatively to the boss **194** by a pinion **198** fixed to the rear portion of said shaft and a flange **200** formed on the shaft and arranged to engage the front face of the boss. The machine is provided with manually operated mechanism hereinafter described for rotating the shaft **192** in order to adjust the roll **182** toward and from the cam **158**. A hand lever (not shown) is provided for rotating the shaft **192** in order to adjust the roll **182** toward and from the cam **158**. The hand lever rotates a shaft **298** (Fig. 1) which has fixed thereto a bevel gear **300** arranged to mesh with a bevel gear **302** fixed to a shaft **304** mounted in a bearing in a fixed bracket **306**. Also fixed to the shaft **304** is a spur gear **308** which meshes with a spur gear **310** fixed to the hub of a clutch member or disk **312** mounted to rotate freely in a bore in the cylindrical head **314** of a bracket **316** fixed to the machine table **45**. The disk and the gear mounted thereon are held against movement endwise of the head **314** by a collar **320** fixed to the hub of the disk. Referring to Fig. 3, the disk **312** has formed therein a marginal flange in which are mounted a plurality of pins **322** constructed and arranged to be received in corresponding bores formed in the marginal flange of a clutch member or disk **324** fixed to a shaft **326** mounted for rotary and sliding movements in the hub of the disk **312** and in a bearing formed in a bracket **328** fixed to the table **45**. The disk **324** is normally urged forwardly into engagement with the disk **312** by a spring **330** surrounding the rear portion of the shaft **326** and confined between the bracket **328** and a collar **332** fixed to the shaft. Fixed to the rear end of the shaft **326** is a spur gear **334** (Fig. 5) which meshes with a first idler **336** freely mounted on a headed screw **338** in a fixed plate **340**. The idler **336** meshes with a second idler **342** freely mounted on a headed screw **344** (Fig. 3) in the plate **340**. The idler **342** meshes with a spur gear **346** fixed to a shaft **348**. Said shaft is mounted in bearings in a block **350** fixed to an extension of the slide **162**. The gear **346** is made long enough to maintain meshing engagement with the second idler **342** in all positions of the slide **162**. Fixed to the rear end of the shaft **348** is a spur gear **352** which, as shown in Fig. 4, meshes with the gear **198** fixed to the screw shaft **192** which operates in the internally threaded lug **196** projecting upwardly from the slide **188** which carries the cam roll **182**. Thus, it will be seen that the rotation of the shaft **298** by the hand lever operates through the connections above described to cause the screw shaft **192** to adjust the cam roll **182** (Fig. 6) toward or from the cam **158**.

During the overwiping operation the wiper plates are positively held in contiguous relation to each other at the pivoting point. When the machine is equipped with the wiper assemblies illustrated in Fig. 8 the wiper plates are held against separation by mechanism now to be described. When the machine is equipped with wiper assemblies of the type illustrated in Fig. 10 the wiper plates are positively held against separation at the pivoting point

by the engagement of the roll **86** with the inner wall of the rear portion **102** of the slot **84**. In Figs. 2 and 17 there is illustrated mechanism for holding against separation the wiper plates **30** and **32** illustrated in Fig. 8. This mechanism comprises a latch arm **202** fixed to the bottom of the carrier **62** and a detent **204** pivotally mounted at **205** on a plate **206** fixed to the carrier **68**. A leaf spring **208** fixed to the top of the carrier **68** normally holds the detent in its position shown in Fig. 17, said position being determined by the engagement of the tail portion **210** of the detent with the bottom of the slide **66**. Referring to Fig. 8, the latching position of the mechanism above described is determined by the engagement of abutment screws **212** fixed in brackets **214** mounted on the carriers **62** and **68**, respectively, with the outer surfaces of rails **216** and **218**. After the completion of the lasting operation the detent **204** (Fig. 17) is moved upwardly out of engagement with the latch arm to permit the wiper assemblies to move away from each other into their respective rest positions, as shown in Fig. 1. To this end a cam **220** (Fig. 17) is fixed to a horizontal cam shaft **222** and arranged to engage a roll **224** mounted in the free end portion of an arm **225**, said arm being provided with downwardly extending ears **226** which engage opposite sides of the cam to maintain registration of the roll therewith. The cam imparts upward movement to a vertical sliding rod **228** and a slide **230**. At its upper end the slide **230** has an inturned portion **232** arranged to engage a pin **234** projecting rearwardly from the detent **204**. Said inturned end portion holds the detent out of engagement with the latch arm until the wiper assemblies begin their movement of separation. At an early stage in the movement of separation of the wiper assemblies the pin moves away from said inturned end portion and the spring **208** returns the detent to its position shown in Fig. 17.

Concomitantly with the opening movement of the wipers after the completion of the heel end lasting operation the wiper supporting members between which the wiper assemblies are mounted are swung outwardly to move the wipers widthwise of the machine out of their articulated position and into their respective retracted positions. In the illustrated machine the outward movement of said plates is effected by the operation of an arm **236** (Figs. 4 and 5) fixed to the vertical cam shaft **128** and positioned beneath the platform **164**. The arm carries a roll **238** which engages a cam face **240** at the free end of an arm **242** pivotally mounted on a headed screw **244** projecting downwardly from the platform. The arm **242** has an arcuate extension **246** projecting laterally therefrom and arranged to engage a roll **248** (Fig. 6) pivotally mounted at the forward end of an arm **250** fixed to and extending forwardly from the rear portion of the slide **162** and spaced vertically therefrom by a plate **252**. In the operation of the machine the vertical cam shaft **128** rotates in a clockwise direction, as seen in Fig. 4, causing the roll **238** to engage the cam face **240** thereby swinging the arm **242** in a counterclockwise direction, thus causing the concave surface of the arcuate extension **246** of said arm to engage the roll **248** and move the slide **162** forwardly, or to the left as seen in Fig. 4. Referring to Fig. 1, the forward movement of the slide causes the links **174** to impart clockwise movement to the plates **40** and **42** at the left side of the machine and counterclockwise movement to the corresponding plates at the right side of the machine. In order to cause the wipers to swing outwardly relatively to the plates into their respective retracted positions each wiper is urged outwardly by a spring **254** the rear portion of which is anchored to a screw eye in a post **256** and the forward portion of which is connected to a chain **258** which extends forwardly around a grooved pulley **260** carried by an angle plate **262** fixed to the plate **40** and is anchored at its forward end to a pin **264** (Fig. 7) mounted in the forward portion of the wiper plate.

Upon the completion of the overwiping movements of the wipers the overlasted margin of the heel portion of the upper together with the flange of the counter and the inwardly extending bottom margin of the lining are permanently secured to the insole on the last bottom by fastenings herein illustrated as tacks driven through suitable apertures in the wipers by mechanism hereinafter described. Referring to Fig. 16, a central tack is driven through an aperture **266** in the wiper **32** located in concentric relation to the common axis on which the wipers close Similar apertures are provided in the margins of the lasting wipers **30** and **32** and are arranged, as shown in Fig. 16, to extend from the central aperture **266** to the forward ends of the wipers. Referring to Fig. 20, each aperture registers with a vertical bore **268** formed in a block **270** extending upwardly from the wiper plate. A tack is driven through each aperture and into the shoe by a driving pin **272** extending downwardly from a driving head **274** into the bore **268**. A tack such, for example, as the tack **276** illustrated in Fig. 23 is conducted into the bore **268** through a flexible tack tube **278** the lower end portion of which is mounted in a counterbore in the block **270** and registers with an angular bore **280** which forms a junction with the bore **268**. The tack comes to rest in a pocket **282** formed in a horizontal slide block **284** which moves to the right against the pressure of a spring **286** (Fig. 20) when the pin moves downwardly to drive the tack. It sometimes happens that one or more tacks are jammed in the tack pocket and must be removed from the pocket before the operation of the machine is resumed. In order to facilitate the removal of such tacks from the pocket the illustrated block **270** is provided with a removable cover plate **288** the inner surface of which forms one wall of the tack receiving pocket. The upper portion of the cover plate is inwardly offset from its lower portion and mounted in a rabbet formed in the block. Referring to Fig. 22, the illustrated cover plate is coterminous with the lower portion of the inner surface of the block **270** and is concavo-convex as seen in plan view. The cover plate is secured to the block **270** by a headed screw **290** (Figs. 20 and 21) extending through a countersunk hole in the cover plate and into a tapped hole in the block. The rear end of the cover plate is located by a pin **292** projecting laterally from the block into an open ended slot in the cover plate.

The action of the lasting wipers on the overlasting margin of the upper forms pleats therein, particularly at the sharply curved portions of the heel seat. It is desirable that these pleats be substantially uniform in size and uniformly spaced about the heel end of the shoe and so located that they are secured by the lasting tacks. To this end the inner margin of each wiper plate is provided with grooves, identified in Fig. 19 by the numeral **294**. The grooves receive the marginal materials during the advancement of the wipers and cause the pleats to be formed and positioned beneath the apertures through which the tacks are driven. It will be seen that there is a groove adjacent to each aperture, the side walls of each groove extending divergently from the aperture to the edge of the wiper. As shown in Fig. 23 the depth of the groove decreases progressively from the edge face of the wiper plate to a terminating point adjacent to the aperture.

In the operation of the illustrated machine the wiper assemblies illustrated in Fig. 1 remain outwardly offset from each other during the greater part of the machine cycle while operations preliminary to the heel end lasting operations are performed by mechanism illustrated and described in my patent No. 2,740,138 hereinbefore referred to. These operations include the actuation of feather line pads **296** (Fig. 1) to clamp the heel end portions of the shoe upper materials against the last preparatory to the heel end lasting operation.

After the operation of the feather line pads the cam **156** (Figs. 1 and 6) operates to swing the heel end wiper assemblies inwardly toward each other into their articu-

lated position shown in Fig. 8. As the wipers come into their articulated position the detent **204** (Fig. 17) engages the latch arm **202** to hold the wipers against movement out of their articulated position during their overwiping movement. Further operation of the cam **156** after the wipers have been brought into their articulated position imparts relative angular movement to the wipers and upon the completion of the operation of the cam **156** such relative angular movement of the wipers is continued and completed by the cam **158** (Fig. 6) to cause the wipers to wipe the lasting margins of the upper and the lining at opposite sides of the heel end of the shoe inwardly over the insole on the last bottom. The degree of wiping movement of the wipers by the cam **158** is determined by the adjustment of the slide **188** (Fig. 6) which determines the position of the roll **182** relatively to the cam **158**. Concomitantly, with the operation of the cam **158** the cam **126** advances the wipers bodily toewardly in order to wipe the lasting margins of the upper and the lining at the back line portion of the shoe inwardly over the insole. Upon the completion of the overlapping movement of the wiper's mechanism (not shown) operates the tack drivers to drive lasting tacks through the overwiped upper materials and the insole, clenching the tacks against the foot facing surface of the insole. After the tacks have been driven the cam **220** (Fig. 17) operates to disengage the detent **204** from the latch arm **202** to permit movement of the wiper assemblies away from each other out of their articulated position. Immediately after the detent is released the cam **140** (Fig. 1) retracts the heel end wiper assemblies rearwardly and the roll **238** (Fig. 4) on the arm **236** operates the lever **242** to return the wiper assemblies to their rest position shown in Fig. 1.

If the heel end lasting performed by the illustrated machine is preliminary to a second heel end lasting operation which completes the shaping of the heel end portion of the upper, only seven tacks are driven by the illustrated machine, three at the back line and two at opposite sides of the breast line portion of the upper. If, on the other hand, the lasting operation performed by the illustrated machine is the only lasting operation on the heel end portion of the upper the illustrated machine drives tacks at regular intervals through the overlasted materials and the margin of the insole to secure the entire heel end portion of the upper to the insole.

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

1. In a shoe machine, a pair of end embracing lasting wipers, carriers in which the wipers are mounted, means for actuating the carriers to move the wipers into and out of contiguous relation to each other, and means for effecting relative angular movement of the wipers after they have been brought into contiguous relation to each other.

2. In a shoe machine, a pair of end embracing lasting wipers characterized by mutually engaging separable bearing surfaces providing for relative angular movement of the wipers, carriers for the wipers respectively, means for actuating the carriers to move the wipers toward and from each other, and means for effecting relative angular movement of the wipers.

3. In a shoe machine, a pair of end embracing lasting wipers characterized by a lateral projection of one wiper constructed and arranged to form a separable articulation with a complementally shaped recess in the other wiper, carriers for the wipers respectively, means for actuating the carriers to advance the wipers into mutually articulated position, and means for effecting angular overwiping movements of the wipers.

4. In a shoe machine, a pair of end embracing lasting wipers characterized by mutually engaging separable bearing surfaces providing for relative angular movement of the wipers, carriers for the wipers respectively, means for actuating the carriers to move the wipers toward and from each other, means for effecting relative angular movement of the wipers to overwipe opposite side portions of a shoe in the machine, and means for actuating the carriers to advance the wipers bodily to overwipe an end portion of the upper.

5. In a shoe machine, a pair of end embracing lasting wipers constructed and arranged for relative angular movement, said wipers being constructed and arranged to provide a separable articulation at the axis of angular movement, carriers for the wipers respectively, and power operated means for actuating the carriers first to move the wipers bodily toward each other and then to impart angular closing movement to the wipers.

6. In a shoe machine, a pair of end embracing lasting wipers constructed and arranged for relative angular movement, said wipers being constructed and arranged to provide a separable articulation at the axis of angular movement, carriers for the wipers respectively, and power operated means for actuating the carriers first to move the wipers into and out of articulated position and then to impart angular closing movement to the wipers.

7. In a shoe machine, a pair of end embracing lasting wipers, two members operable to separate the wipers from each other, means mounting the members for angular movement, and means actuated by angular movement of the members for effecting angular overwiping movement of the wipers about a common axis.

8. In a shoe machine, a pair of end embracing lasting wipers, two members for supporting the wipers respectively, two posts on which the members are mounted for angular movement, means for effecting such angular movement of the members, and means including rolls carried by the members respectively and constructed and arranged to operate against cam surfaces formed in the wipers respectively, for imparting overwiping movement to the wipers.

9. In a shoe machine, a pair of end embracing lasting wipers, two members for supporting the wipers respectively, two posts on which the members are mounted for angular movement, means for effecting such angular movement of the members, and means including rolls carried by the members respectively and constructed and arranged to operate against cam surfaces formed in the wipers respectively, for imparting overwiping movement to the wipers, members for imparting toeward movement to the wipers, and tongue and groove connections between the last-mentioned members and the wipers defining a path of overwiping movement of the wipers.

10. In a shoe machine, a pair of end embracing lasting wipers, wiper supporting means comprising two plates, a spacer located between the plates and arranged to position the plates relatively to each other to receive between them a wiper and an actuator, means mounting each supporting means for angular movement, and means on the supporting means for determining a path of movement of the wiper relatively to the supporting means.

11. In a shoe machine, a pair of end embracing lasting wipers, wiper supporting means comprising two plates, a spacer located between the plates and arranged to position the plates relatively to each other to receive between them a wiper and an actuator, and means mounting each supporting means for angular movement on a fixed axis.

12. In a shoe machine, a pair of end embracing lasting wipers, means for moving the wipers widthwise of a shoe in the machine into articulated position, and means operating after the wipers have come into articulated position to cause them to overwipe a shoe in the machine.

13. In a shoe machine, a pair of end lasting wipers, means for advancing the wipers into articulated position, means for holding the wipers out of articulated position, and means operating after the wipers have been brought into articulated position to cause the wipers to last a shoe in the machine.

14. In a shoe machine, a pair of end lasting wipers characterized by means forming a separable articulation, means for advancing the wipers into articulated position, releasable means for holding the wipers against movement out of articulated position, means for actuating the wipers to last an end portion of a shoe in the machine, and means for releasing said releasable means to permit movement of the wipers out of articulated position.

15. In a shoe machine, a pair of end lasting wipers characterized by means providing a separable articulation of the wipers, means for moving the wipers widthwise of the shoe from a remote position relatively to each other into articulated position, a latch for holding the wipers against movement out of articulated position, and automatic means for releasing said latch.

16. In a shoe machine, a pair of end lasting wipers, means providing in the wipers a separable articulation, wiper carriers, means for actuating the carriers to move the wipers widthwise of a shoe in the machine into their articulated position, and means for positively holding the carriers against movement relatively to each other in a direction to permit movement of the wipers out of their articulated position.

17. In a shoe machine, a pair of end lasting wipers characterized by means providing a separable articulation of the wipers, wiper carriers, power operated means for actuating the carriers to advance the wipers widthwise of the shoe from a remote position relatively to each other to their articulated position, a latch for holding the carriers against return movement after the wipers have been brought into articulated position, and power operated means for releasing the latch to permit movement of the carriers out of their articulated position.

18. In a shoe machine, a pair of end lasting wipers, means for supporting the wipers and positioning them heightwise of a shoe in the machine, a pair of wiper carriers, means for actuating the carriers to advance the wipers from positions in which they are spaced from each other widthwise of the shoe into mutually contacting position preparatory to the wiping operation, and means for imparting relative angular movement to the wipers to overwipe a shoe in the machine.

19. In a shoe machine, a pair of end lasting wipers, four plates, two at each side of the machine, held against movement heightwise of a shoe in the machine and spaced apart to receive the wipers between them, means for advancing the wipers from a position in which they are spaced apart from each other into contiguous relation to each other, and means operating thereafter to cause the wipers to perform a lasting operation.

20. In a shoe machine, a pair of end lasting wipers, four plates, two at each side of the machine, between which the wipers are mounted, means mounting the plates for angular movement widthwise of a shoe in the machine, operating connections between the plates and the wipers, means for advancing the wipers from a rest position in which they are spaced apart from each other widthwise of a shoe in the machine into contiguous relation to each other preparatory to a lasting operation, and means for actuating the plates to cause the wipers to perform a lasting operation on a shoe in the machine.

21. In a shoe machine, a lasting wiper, a member on which the wiper is mounted, and means for actuating the member first to bring the wiper into contact with another wiper and then impart angular wiping movement to the wiper.

22. In a shoe machine, a lasting wiper, a member on which the wiper is mounted, means for actuating the member to bring the wiper into contiguous relation to another wiper, means for actuating the member to cause the wiper to perform a wiping operation, and a spring for retracting the wiper.

23. In a shoe machine, a lasting wiper, a plate on which the wiper is supported, operating connections between the plate and the wiper, and means for actuating the plate first to advance the wiper from a remote position into contact with another wiper and then to impart angular wiping movement to the wiper.

24. In a shoe machine, a lasting wiper, a plate on which the wiper is supported, means for imparting angular movement to the plate, connections between the plate and the wiper whereby such angular movement advances the wiper from a remote position into contiguous relation to another wiper, and means for imparting further angular movement to the plate to cause the wiper to perform a wiping operation.

25. In a shoe machine, a lasting wiper, a plate on which the wiper is supported, means mounting the plate for angular movement, a first cam, means actuated by said cam for imparting an initial angular movement to the plate, connections between the plate and the wiper whereby such initial angular movement of the plate advances the wiper from a remote position into contiguous relation to another wiper, a second cam, and means operated by said second cam for imparting a further angular movement to the plate thereby to cause the wiper to perform a wiping operation.

26. In a shoe machine, a lasting wiper, a plate on which the wiper is supported, means for actuating the plate to advance the wiper from a remote position into predetermined relation to a shoe in the machine, means for further actuating the plate to cause the wiper to perform a wiping operation widthwise of a shoe in the machine, and means for moving the wiper relatively to the plate toewardly of the shoe.

27. In a shoe machine, a lasting wiper, a plate on which the wiper is mounted, operating connections between the plate and the wiper, means for actuating the plate to advance the wiper from a remote position into position to perform a wiping operation on a shoe in the machine, means for further actuating the plate to cause the wiper to perform a wiping operation widthwise of the shoe, means for advancing the wiper relatively to the plate to cause the wiper to perform a wiping operation toewardly of the shoe, and means for retracting the wiper.

28. In a shoe machine, a lasting wiper, a first cam, connections from the cam for advancing the wiper from a remote position into predetermined relation to a shoe in the machine, a second cam, operating connections from the second cam for causing the wiper to perform a wiping operation widthwise of the shoe, a third cam, connections from the third cam for causing the wiper to perform a wiping operation toewardly of the shoe, and means for retracting the wiper.

29. In a shoe machine, a lasting wiper, a first cam, connections from the first cam for advancing the wiper from a remote position into predetermined relation to a shoe in the machine, a second cam, operating connections from the second cam for causing the wiper to perform a wiping operation widthwise of the shoe, a third cam, connections from the third cam for causing the wiper to perform a wiping operation toewardly of the shoe, a fourth cam, means actuated by the fourth cam for retracting the wiper longitudinally of the shoe, and means for returning the wiper to its rest position.

30. In a shoe machine, a lasting wiper, an operating member, connections from the member to the wiper for advancing the wiper from a remote position into predetermined relation to a shoe in the machine, a slide, and means for actuating said slide to advance the wiper toewardly of the shoe.

31. In a shoe machine, an end lasting wiper, a slide for advancing the wiper toewardly of a shoe in the machine, connections between the slide and the wiper for directing a wiping movement of the wiper, an operating member, and means actuated by the operating member for advancing both the wiper and the slide widthwise of the shoe from a remote position into predetermined relation to the shoe.

32. In a shoe machine, a lasting wiper, a slide, a carrier

for the slide, means for advancing the slide to cause the wiper to perform a wiping operation toewardly of a shoe in the machine, an operating member, means actuated by the operating member for advancing the wiper together with the slide and the carrier widthwise of the shoe from a remote position into predetermined relation to the shoe, means for holding the carrier against return movement, and means for actuating the operating member to cause the wiper to perform a wiping operation widthwise of the shoe.

33. In a shoe machine, a lasting wiper, a slide, a carrier for the slide, means for advancing the slide to cause the wiper to perform a wiping operation toewardly of a shoe in the machine, an operating member, means actuated by the operating member for advancing the wiper together with the slide and the carrier widthwise of the shoe from a remote position into predetermined relation to the shoe, a latch for holding the carrier against return movement, and means for actuating the operating member to cause the wiper to perform a wiping operation widthwise of the shoe.

34. In a shoe machine, a lasting wiper, a slide, a carrier for the slide, means for advancing the slide to cause the wiper to perform a wiping operation toewardly of a shoe in the machine, an operating member, means actuated by the operating member for advancing the wiper together with the slide and the carrier widthwise of the shoe from a remote position into predetermined relation to the shoe, a latch for holding the carrier against return movement, means for actuating the operating member to cause the wiper to perform a wiping operation widthwise of the shoe, and power operated means for releasing the latch to permit the return of the carrier together with the slide and the wiper to their rest positions.

35. In a shoe machine, a lasting wiper, a slide for advancing the wiper toewardly of a shoe in the machine, connections between the slide and the wiper for directing a wiping movement of the wiper, a carrier for the slide, an operating member, means actuated by the operating member for advancing the wiper together with the slide and the carrier from a remote position into predetermined relation to the shoe, and connections between the operating member and the wiper for holding the wiper against return movement.

36. In a shoe machine, a lasting wiper, a slide for advancing the wiper toewardly of a shoe in the machine, connections between the slide and the wiper for directing a wiping movement of the wiper, a carrier for the slide, an operating member, means actuated by the operating member for advancing the wiper together with the slide and the carrier from a remote position into predetermined relation to the shoe, connections between the operating member and the wiper for holding the wiper against return movement, said connections including a roll carried by the operating member, and means for adjusting the roll to vary the position of the wiper widthwise of the shoe.

37. In a shoe machine, a lasting wiper, a slide for advancing the wiper toewardly of a shoe in the machine, connections between the slide and the wiper for directing a wiping movement of the wiper, an operating member, means actuated by the operating member for advancing both the wiper and the slide widthwise of the shoe from a remote position into predetermined relation to the shoe, and means for holding the slide and the wiper against return movement widthwise of the shoe comprising a roll carried by the operating member and constructed and arranged to act on the slide.

38. In a shoe machine, a lasting wiper, a slide for advancing the wiper toewardly of a shoe in the machine, connections between the slide and the wiper for directing a wiping movement of the wiper, an operating member, means actuated by the operating member for advancing both the wiper and the slide widthwise of the shoe from a remote position into predetermined relation to the shoe, means for holding the slide and the wiper against return movement widthwise of the shoe comprising a roll carried by the operating member and constructed and arranged to act on the slide, and means for adjusting the roll generally widthwise of the shoe.

39. In a shoe machine, a lasting wiper, a slide for advancing the wiper toewardly of a shoe in the machine, connections between the slide and the wiper for directing a wiping movement of the wiper, an operating member, a first roll carried by the operating member and arranged to act on the wiper to advance both the wiper and the slide from a remote position widthwise of the shoe into predetermined relation to the shoe, and a second roll carried by the operating member and arranged to act on the slide to hold both the slide and the wiper against return movement widthwise of the shoe.

40. In a shoe machine, a lasting wiper, a slide for advancing the wiper toewardly of a shoe in the machine, a carrier for the slide mounted for angular movement widthwise of the shoe, connections between the slide and the wiper for directing a wiping movement of the wiper, an operating member, a first roll carried by the operating member and arranged to act on the wiper to advance both the wiper and the slide from a remote position widthwise of the shoe into predetermined relation to the shoe, and a second roll carried by the operating member and arranged to act on the slide to hold both the slide and the wiper against return movement widthwise of the shoe.

41. In a shoe machine, a lasting wiper, a slide, connections including an operating member, between the slide and the wiper for directing a wiping movement of the wiper, means for actuating the slide to advance the wiper toewardly of a shoe in the machine, and a roll carried by said operating member and constructed and arranged to operate in a slot in the wiper, said slot being extended to provide for the toeward movement of the wiper.

42. In a lasting machine, a lasting wiper, an operating member, a roll carried by said operating member and mounted in a slot in the wiper, and a removable pin on which the roll is pivotally mounted.

43. In a lasting machine, a lasting wiper, a plate on which the wiper is supported, means for actuating the plate to impart a wiping movement to the wiper, and connections between the plate and the wiper comprising a roll positioned in a slot in the wiper, and a removable pin mounted in the plate and arranged to provide a pivotal mounting for the roll.

44. In a lasting machine, a lasting wiper, a wiper carrier comprising parallel plates between which the wiper is mounted, means for actuating the carrier to impart a wiping movement to the wiper, and operating connections between the carrier and the wiper comprising a roll positioned between the parallel plates of the carrier and mounted in a slot in the wiper, a pin on which the roll is mounted, a threaded element formed integrally with said pin, and a head on said threaded element arranged to facilitate the removal of the pin from the roll.

45. In a lasting machine, a pair of lasting wipers, a first actuator for advancing the wipers bodily as a unit, a second actuator for imparting an invariable angular operation to the wipers, and a third actuator operable after the completion of the operation of the wipers by the second actuator to impart a variable angular operation thereto.

46. In a lasting machine, a lasting wiper constructed and arranged for angular operating movement, a first actuator for imparting an invariable angular wiping movement to the wiper, and a second actuator operable after the completion of the advancement of the wiper by the first actuator for imparting a variable angular wiping movement to the wiper.

47. In a lasting machine, a lasting wiper, a first cam, means actuated by said first cam for imparting an invariable movement to the wiper, a second cam, and means

actuated by said second cam for imparting a variable wiping movement to the wiper.

48. In a shoe machine, a lasting wiper, and means for imparting a wiping movement to the wiper including a slide, a first cam, a first roll mounted in a fixed position on the slide and arranged to be actuated by the first cam, a second cam, a second roll carried by the slide and arranged to be actuated by the second cam, and means for adjusting the second roll toward and from the second cam.

49. In a lasting machine, a lasting wiper, a first slide, operating connections from the first slide to the wiper, a first cam, a first roll mounted in a fixed position on the first slide and arranged to be actuated by the first cam, a second cam, a second slide carried by the first slide, a second roll carried by the second slide and arranged to be actuated by the second cam, and means for adjusting the second slide to move the second roll toward and from the second cam.

50. In a lasting machine, a lasting wiper, a first slide, operating connections from the first slide to the wiper, a second slide carried by the first slide, a roll carried by the second slide, and a cam constructed and arranged to actuate the roll thereby to advance the wiper.

51. In a lasting machine, a lasting wiper, a first slide, operating connections from the first slide to the wiper, a second slide carried by the first slide, a roll carried by the second slide, a cam constructed and arranged to actuate the roll thereby to advance the wiper, an adjuster, and means operated by the adjuster for moving the second slide relatively to the first slide thereby to adjust the space relation between the roll and the cam.

52. In a lasting machine, a lasting wiper, an operating member, operating connections between the operating member and the wiper, a slide carried by the operating member, a roll mounted on the slide, a cam constructed and arranged to actuate the roll, a screw for moving the slide relatively to the operating member to adjust the space relation between the cam and the roll, an adjuster, and operating connections from the adjuster to the screw.

53. In a shoe machine, a heel end lasting wiper, a slide, a carrier for the slide, means for advancing the slide toewardly of a shoe in the machine to cause the wiper to perform a wiping operation at the back line of the shoe, a latch for holding the carrier against movement widthwise of the shoe, a cam, and connections from the cam for releasing the latch.

54. In a lasting machine, a lasting wiper having a wiping margin characterized by apertures through which tacks are driven and characterized further by the formation therein of a plurality of pleat forming grooves each extending from an aperture to the edge of the wiping margin and each converging inwardly from the edge of the wiping margin and becoming progressively shallower as they converge.

55. In a lasting machine, a lasting wiper having apertures through which tacks are driven, said wiper being characterized by the formation in its wiping margin of a plurality of grooves each terminating between an aperture and the wiping edge and constructed and arranged to form a pleat in the fullness in the overlasted substance of a shoe in the machine.

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