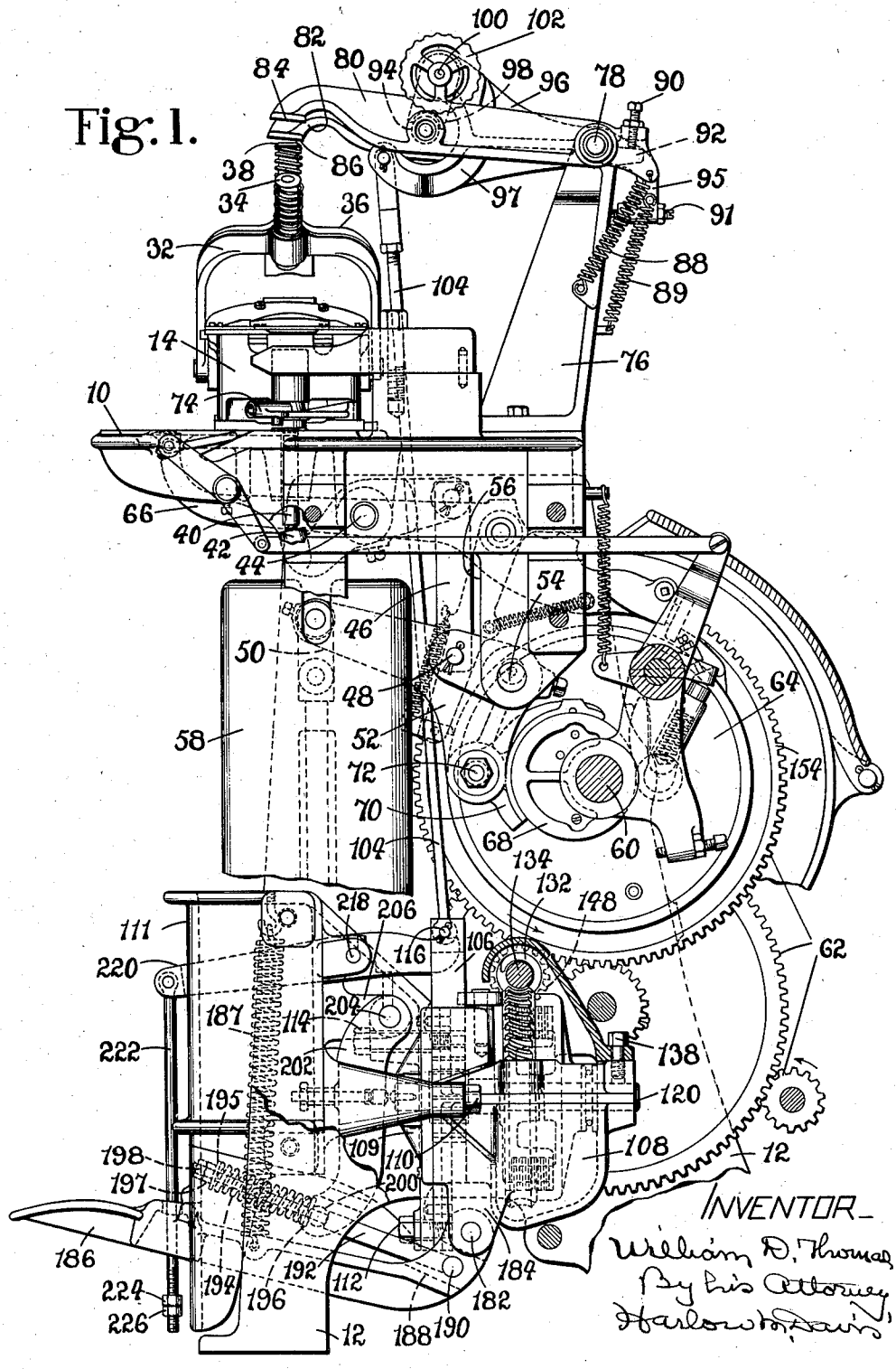
May 14, 1935. W. D. THOMAS 2,001,002

CEMENT SOLE ATTACHING MACHINE

Filed Dec. 7, 1932 4 Sheets-Sheet 1

Fig. 1.



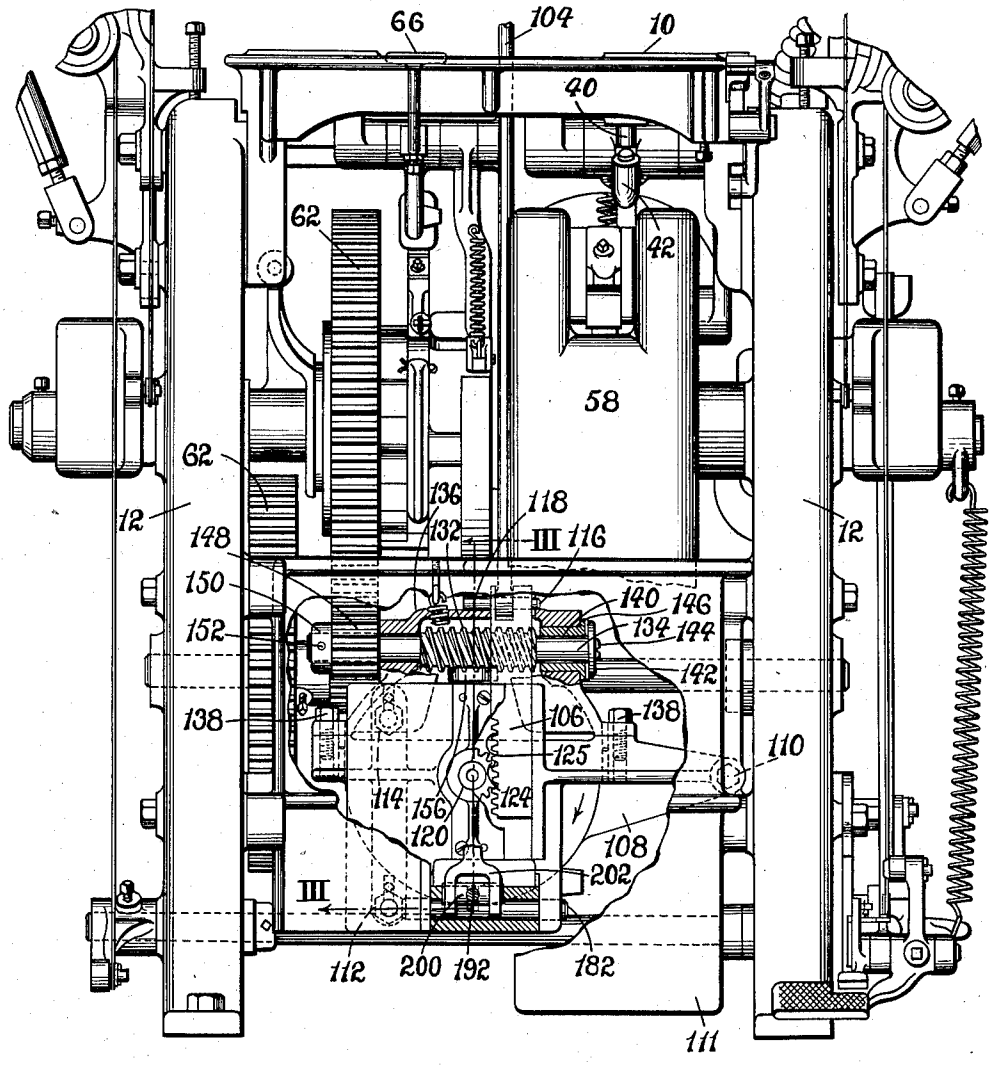
INVENTOR—
William D. Thomas
By his Attorney
Harlow W. Davis

May 14, 1935. W. D. THOMAS 2,001,002

CEMENT SOLE ATTACHING MACHINE

Filed Dec. 7, 1932 4 Sheets-Sheet 2

Fig. 2.



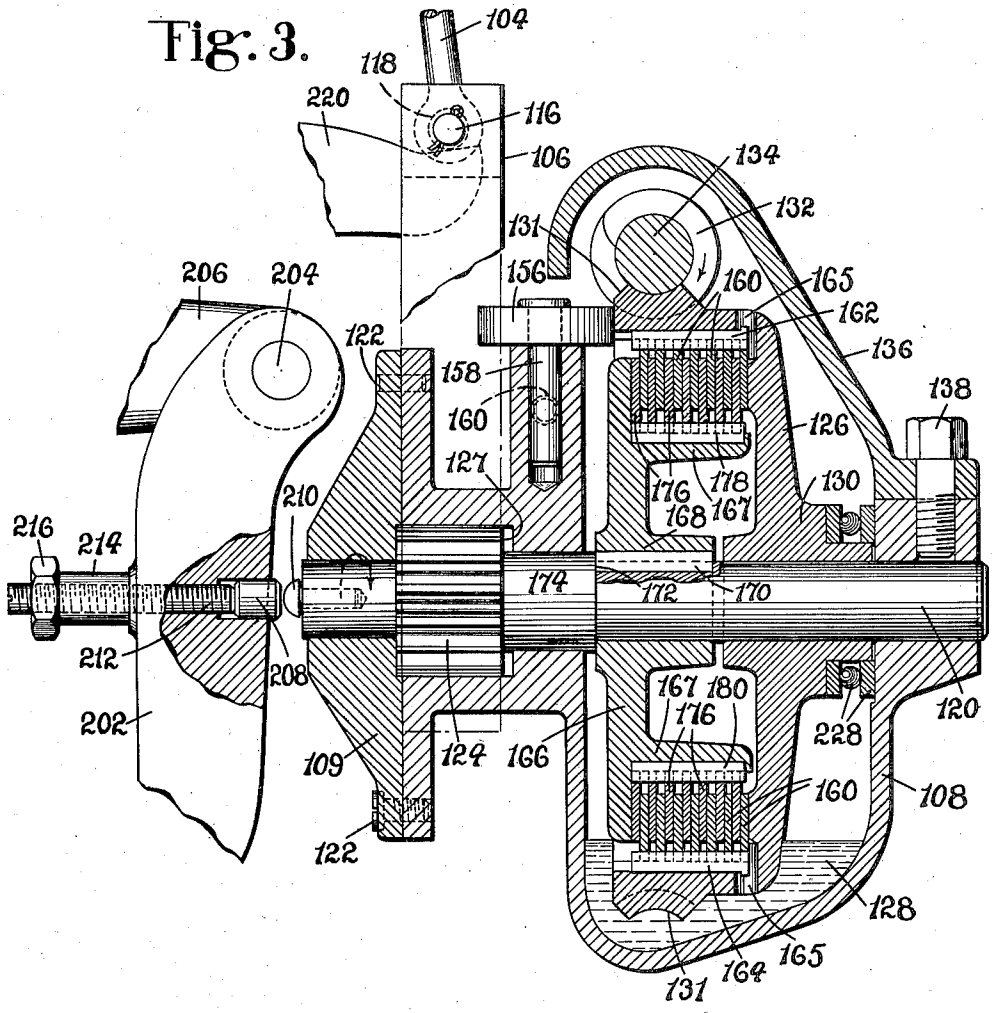
INVENTOR
William D. Thomas
By his Attorney
Harlow M. Davis.

May 14, 1935. W. D. THOMAS 2,001,002

CEMENT SOLE ATTACHING MACHINE

Filed Dec. 7, 1932 4 Sheets-Sheet 3

Fig. 3.



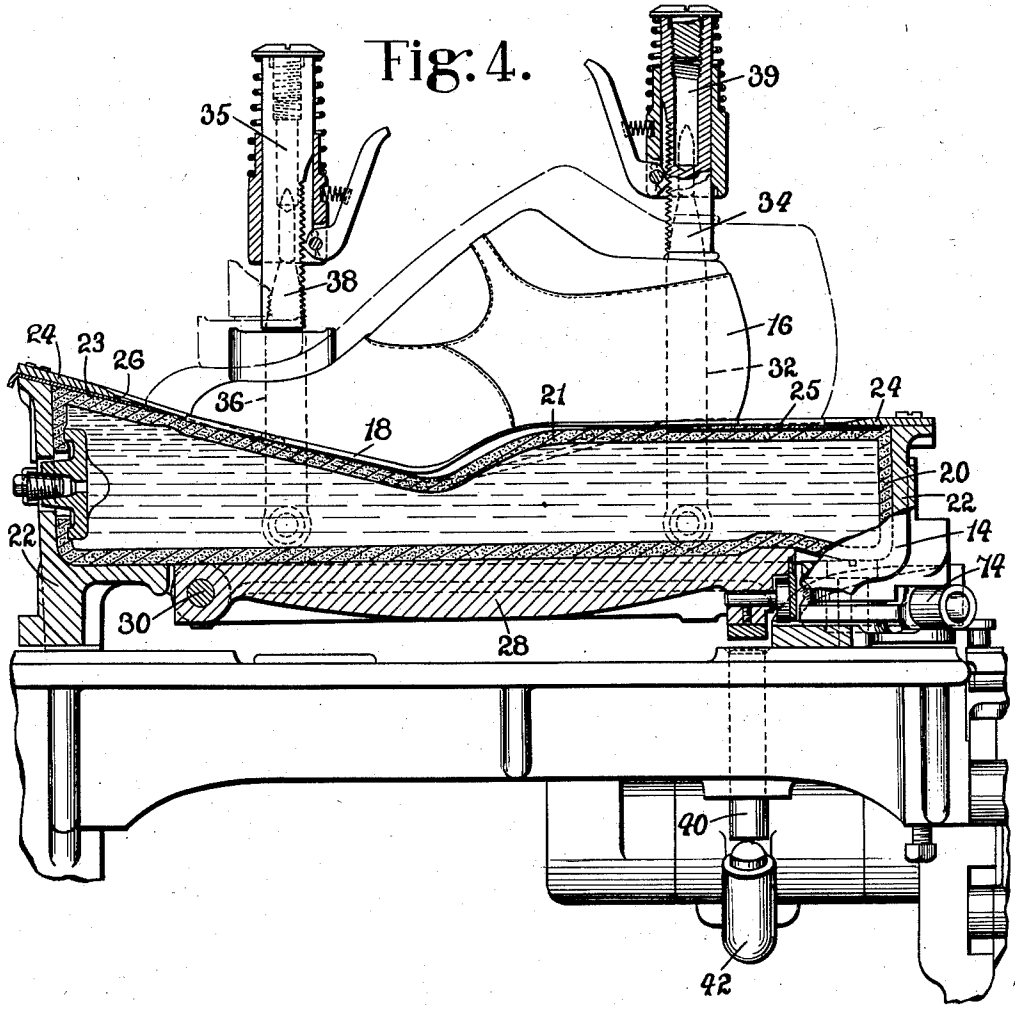
INVENTOR
William D. Thomas
By his Attorney
Harlow M. Davis

May 14, 1935. W. D. THOMAS 2,001,002

CEMENT SOLE ATTACHING MACHINE

Filed Dec. 7, 1932 4 Sheets-Sheet 4

Fig. 4.



INVENTOR.

William D. Thomas

By his Attorney

Harlow M. Davis

Patented May 14, 1935 2,001,002

UNITED STATES PATENT OFFICE

2,001,002

CEMENT SOLE-ATTACHING MACHINE

William D. Thomas, Lynnfield, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application December 7, 1932, Serial No. 646,156

39 Claims. (Cl. 12—33)

This invention relates to machines for use in the manufacture of boots and shoes and is illustrated herein as embodied in a machine for cement-attaching soles to shoes of the type shown and described in Letters Patent of the United States No. 1,897,105, granted February 14, 1933, on the application of Milton H. Ballard. It is to be understood, however, that in some of its novel and useful aspects the present invention is not limited to machines of that particular type.

Machines for cement-attaching soles to shoes of the type disclosed in the above-mentioned patent are provided with pressure-applying means comprising a pair of levers for engaging plungers carried by a presser unit or pad box mounted on the machine, the plungers being constructed and arranged to apply pressure to a shoe positioned on the pad box. The pad box utilized in such machines, as illustrated in the patent referred to, comprises a hollow flexible pad containing a fluid, a box-like member for confining the pad constructed and arranged to expose one wall thereof for the reception of a sole and shoe, and presser members or plungers mounted on the box-like member and arranged to engage the shoe to apply preliminary pressure thereto prior to the application of a final or sole-attaching pressure, and to receive the thrust caused by this sole-attaching pressure. The pad box is also provided with means for deforming a wall of the flexible pad to cause the final pressure to be transmitted through the fluid to press the sole forcibly against the shoe bottom, the preliminary pressure being maintained by locking means mounted on the pad box and coacting with the plungers.

The preliminary pressure is applied to the shoe and sole for the purpose of holding them in proper position relatively to each other after they have been located on the pad by positioning mechanism fully shown and described in the Ballard patent referred to above. The preliminary pressure, however, not only prevents the shoe and sole from becoming displaced relatively to each other on the pad, but it also depresses or sinks the sole and shoe into the pad, thereby securing a better contact of the sole with the shoe bottom before the final pressure is applied. When the final pressure is applied by deforming the lower wall of the pad, the distortion thereof will cause the sole to be pressed forcibly against the shoe bottom, and will assure a more solid and permanent attachment of the sole to the shoe than could be obtained if the sole and shoe had not been pressed into the pad before the final pressure was applied.

Heretofore in machines of this type the preliminary pressure has been applied directly by the operator through treadle-operated mechanism arranged to cause the pressure-applying levers to force the plungers against the last and shoe, these pressure-applying levers being loosely connected to each other by a horizontal rod which is engaged by a dog adjustably mounted on an intermediate lever. The intermediate lever is connected to the treadle by a treadle rod and the arrangement of the mechanism is such that the pressure exerted on the horizontal rod will be distributed between the pressure-applying levers in pressing the shoe against the pad. When the treadle is depressed by the operator the pressure-applying levers are rotated about their pivots to force the plungers into engagement with the last and shoe, thereby pressing the shoe and sole firmly against the supporting surface of the pad.

It will be seen from the above that in order to apply preliminary pressure to a shoe in such a manner as to cause the shoe and sole to be pressed into the pad a suitable distance regardless of the size of the particular shoe being operated upon, the operator must not only apply the preliminary pressure manually by exerting the necessary pressure on the treadle himself, but he must also judge the amount of pressure that he should exert on the treadle in order to obtain the proper results, since different shoes will require different pressures to sink them into the pad the desired distance. Generally speaking, it has been found that the amount of preliminary pressure required to press a shoe and sole into the pad a predetermined distance prior to the application of the final pressure is substantially the same for each unit of bottom area of the shoe, irrespective of the size of the shoe operated upon. In other words, the amount of preliminary pressure required to press a large shoe a given distance into the pad will average substantially the same for each unit of area of the bottom surface of the shoe as the pressure per unit of bottom area necessary to sink a small shoe approximately the same distance into the pad. From the above it follows that a large shoe, having a greater sole area than a small shoe, will necessarily require a greater preliminary pressure than the small shoe in order to average substantially the same amount of pressure for each unit of area of the shoe bottom, and there-

by to insure that both shoes will be pressed into the pad approximately the same distance.

Under present conditions considerable labor is involved in applying this preliminary pressure and, when it is continued for several hours, the operator becomes fatigued. Moreover, it is not always possible for the operator to judge accurately the amount of pressure he must exert on the treadle to produce the proper amount of preliminary pressure for the particular shoe operated upon, which pressure, as stated, should average substantially the same for each unit of area of the shoe bottom in order to cause the shoes to be pressed into the pad a uniform distance irrespective of variation in the size of the shoes.

It is an object of the present invention to provide improved power-operated mechanism for applying preliminary pressure to a shoe and sole mounted on a flexible pad, this mechanism being constructed and arranged automatically to vary the pressure substantially in accordance with the size of the shoe being operated upon so that each shoe will be pressed into the pad approximately the same distance irrespective of its size.

To the attainment of this object and in accordance with a feature of the invention novel means is provided in the illustrated machine for utilizing the power of the machine to apply preliminary pressure to a shoe and sole, this means, as illustrated, including a friction clutch comprising driving and driven elements constructed and arranged to actuate the pressure-applying mechanism in such a manner that when the sole and shoe have been subjected to the proper preliminary pressure for the size of shoe being operated upon, the clutch elements will slip, thus preventing the application of further pressure to the sole and shoe. The pressure-applying mechanism includes a pair of levers pivoted for movement toward and away from a shoe on a last and a sole mounted on the pad, these levers having an adjustable connection with an intermediate lever which is connected by a rod to a reciprocatory rack, the rack being actuated by a pinion secured to the shaft which carries the clutch elements. Upon engagement of the driving element of the clutch with the driven element the rack is reciprocated to rotate the pivoted levers into engagement with a pair of shoe engaging devices or plungers to move these plungers into contact with the cone of the last and the forepart of the shoe and thus press the sole and shoe forcibly into the flexible supporting wall of the pad, this preliminary pressure being maintained by the locking means previously referred to.

In accordance with another feature of the invention novel means is provided for automatically limiting and controlling the preliminary pressure substantially in accordance with the size of the shoe being operated upon so that the same average pressure per unit of bottom area will be applied to each shoe irrespective of its size and thus cause the shoe to be pressed into the pad approximately the same distance whether it is a large shoe or a small shoe. As illustrated, the friction clutch is actuated by treadle-operated mechanism which applies pressure yieldingly to the clutch elements, these elements being constructed and arranged to operate the pressure-applying mechanism only until the resistance offered thereto is equal to the pressure holding the clutch elements in operative relation to each other. In the construction shown, the means for controlling and limiting the preliminary pressure in accordance with the size of the shoe includes a variable treadle stop which limits movement of the treadle in applying pressure to the clutch elements, this treadle stop being automatically positioned by the position of the top of the last in the shoe which is being operated upon or, in other words, in accordance with the height of such last. The position of the top of the last is controlled by two factors, first, by the height of the last itself, which is determined by the size of the shoe, and, secondly, by the area of the bottom surface of the shoe. The areas of the bottom surfaces of shoes will differ in shoes of different sizes and these areas may also differ in shoes of the same size but of different styles. For example, the bottom area of a shoe having a broad toe may be greater than the bottom area of a shoe having a narrow toe although both shoes may take lasts of substantially the same heights. The shoe having the greater bottom area, however, will not be sunk so far into the pad by a given amount of pressure as the shoe with the smaller bottom area. Consequently, the top of the last in such a shoe will not be lowered as much as the top of the last of the smaller shoe and the treadle stop will not be moved so far, even though the heights of the lasts in the shoes are substantially the same. Since the treadle stop will be moved less when the larger shoe is on the pad the treadle will be depressed a greater distance before it contacts with the stop, thereby exerting a greater pressure on the clutch elements. These same principles, namely, that the position of the top of the last in the shoe which is being operated upon is controlled both by the height of the last and by the bottom area of the shoe, and that this position automatically limits the pressure applied to clutch elements in accordance with the size of the shoe, will apply, of course, when operating on shoes of the same style but of different sizes and which consequently require lasts of different heights.

Since the power exerted by the clutch elements to operate the pressure-applying mechanism determines the pressure applied to the sole and shoe, it will be seen that the preliminary pressure applied to each sole and shoe is automatically determined by the size of the shoe being operated upon. The arrangement is such that this pressure will average substantially the same for each unit of area of the shoe bottom irrespective of the size of the shoe. Accordingly, each shoe and sole will be sunk into the pad approximately the same distance before the final pressure is applied, thereby insuring that the shoe and sole will be held in proper position relatively to each other on the pad and will be sunk far enough into the pad to receive the full benefit of the sole-attaching or final pressure when it is applied.

With the above and other objects and features in view the invention will now be described with reference to the accompanying drawings and pointed out in the claims.

In the drawings,

Fig. 1 is a side elevation partly in section of a machine for cement-attaching soles to shoes embodying the present invention;

Fig. 2 is a front elevation of the lower portion of the machine shown in Fig. 1, with parts broken away and in section;

Fig. 3 is a vertical section illustrating on an enlarged scale the construction of the clutch mechanism and parts associated therewith; and

Fig. 4 is a sectional view of the pad box with a shoe on the pad, the shoe and table being shown in full with the parts in the positions they assume when preliminary pressure is being applied to the shoe.

The illustrated machine is of the type disclosed in the above-mentioned Ballard Patent No. 1,897,105, the present invention being embodied in mechanism for applying preliminary pressure to a shoe and sole mounted on a pad box positioned on the table of the machine. Since the details of many portions of the machine of the Ballard patent are of no consequence in so far as the present invention is concerned, a complete disclosure of that machine is believed to be unnecessary and reference may be had to the patent mentioned for a full disclosure of such parts of the machine as are not illustrated and described herein.

The illustrated machine is provided with a frame comprising a table **10** supported by legs **12** and arranged to receive a pad box **14** (Figs. 1 and 2) on which a shoe **16** and a sole **18** (Fig. 4) may be pressed forcibly together and held in such position while the cement, by which the sole is to be attached to the shoe, sets. The machine is provided with means (not shown) for positioning the shoe and sole relatively to each other before the preliminary pressure is applied, which means is of the character disclosed in the Ballard patent mentioned above.

The pad box **14**, as illustrated in the above-mentioned patent, comprises a hollow pad member **20** (Fig. 4) contained in a box-like confining member **22**, preferably an aluminum casting, having at its top a steel plate **24** provided with an opening **26** for exposing the top wall **21** of the pad **20**. The opening **26** is shaped to conform to the general outline of the sole of a shoe and is sufficiently large to permit the sole of the largest shoe which is to be operated upon to be placed on the exposed wall **21** of the pad. An adjustable mask plate **23** is interposed between the plate **24** and the top wall of the pad at its forward end to prevent excessive distortion or bulging of the pad when the final pressure is applied by the pad, the heel end of the pad being provided with a metal plate **25** vulcanized into the pad for the same purpose. The pad is filled with fluid, for example, water, and the box-like confining member **22** is provided with a door-like bottom member **28** pivoted at **30**. The pad box **14** is also provided with a swinging bail or yoke **32** (Fig. 1) having a last-engaging plunger **34** which may be brought into position over the heel end of a lasted shoe placed on the pad **20**, and with another bail **36** having a toe engaging plunger **38**. When a sole and shoe have been placed upon the pad **20** and have been positioned relatively to each other by the positioning mechanism referred to, preliminary pressure may be applied thereto in a manner to be hereinafter described, this pressure being sustained by means of mechanisms indicated generally at **35** and **39** and comprising spring-pressed pawls pivoted respectively to the yokes **36**, **32** and engaging ratchet teeth formed in the plungers **38**, **34** to prevent upward movement of the plungers except when the pawls are withdrawn.

In order that the different kinds of pressure referred to herein may not be confused with each other, it is deemed advisable at this point to explain briefly the meanings intended by the various terms used. The term "preliminary pressure" as used hereinafter in the description and claims is intended to apply to the pressure exerted by the presser members or plungers which preliminarily press the shoe and sole against the pad, and the term "final pressure" to the pressure exerted against the shoe and sole by the pad itself through the distortion of its exposed wall. The term "pressure" when used alone should not be construed as necessarily indicating the total pressure applied to the shoe and sole, that is, the sum of the preliminary pressure and the final or sole-attaching pressure. When the term "pressure" is unqualified, for example, by the word "preliminary" or the word "final", it refers to that one of these two kinds of pressure to which the mechanism then under consideration obviously relates. When the total pressure is intended the full expression will be used.

The preliminary pressure having been applied, the illustrated machine is provided with means for distorting the exposed wall of the pad to apply final pressure to press the sole forcibly against the shoe bottom, power-operated mechanism being provided for this purpose of a character fully shown and described in the Ballard patent previously mentioned and comprising a plunger **40** mounted for reciprocatory movement in the table **10** and arranged to engage the door-like member **28** to rock it upwardly and thereby distort the bottom wall of the yieldable pad member **20**. This dilates the upper wall of the pad causing it to bulge more or less around the sole, as shown in Fig. 4, thereby pressing the sole forcibly against the shoe bottom. The plunger **40** is forced upwardly by the forward end of a lever **42** (Fig. 1) fulcrumed at **44** beneath the table **10** and pivoted at its rear end to a downwardly extending link **46** which, in turn, is pivoted at **48** to the intermediate portion of a forwardly extending arm **50** of a bell crank lever **52**, fulcrumed at **54** on a bracket **56** extending downwardly from the table **10**. The forwardly extending arm **50** supports a heavy weight **58** which tends, through the connections already described, to rock the lever **42** about its pivot **44** in a clockwise direction, as viewed in Fig. 1, and thus elevate the plunger **40** to its pressure-applying position, but is prevented from so doing by mechanism which controls the action of the weight **58**.

The mechanism for controlling the action of the weight **58** comprises a main power shaft **60** journaled in suitable bearings in the legs **12** of the table **10** and rotated by a motor (not shown) through gearing **62** driven by a one-revolution clutch **64**, the operation of the clutch being controlled by a hand lever **66**. Fast upon the shaft **60** is an eccentric **68** (Fig. 1) which is engaged by and cooperates with a shoe **70** pivoted at **72** to a depending arm of the lever **52**. When the clutch-controlling lever **66** is depressed to trip the clutch **64**, the shaft **60** is rotated through a single revolution in a counter-clockwise direction, as viewed in Fig. 1 so that the eccentric **68** will permit the arm **50** of the bell crank lever **52** to move downwardly under the influence of the weight **58**, thus rocking the lever **42** in a clockwise direction and forcing the plunger **40** upwardly against the pivoted bottom member **28** of the pad box **14**. The door-like bottom member **28** is forced upwardly to distort the pad **20**

and thereby transmit a final pressure of approximately 60 pounds to the square inch to the shoe bottom. The door-like member 28 is locked in displaced position by a latch illustrated at 74 (Fig. 4), after which the pad box may be removed from the machine and the shoe and sole held under pressure until the cement has set, the latch 74 being operated automatically by mechanism described in the Ballard patent mentioned above.

Turning now to the mechanism embodying the present invention which is utilized, as illustrated herein, for applying preliminary pressure to the shoe and sole by power, a bracket 76 (Fig. 1) projects upwardly from the rear of the table 10 and carries the fulcrum 78 of a pair of forwardly projecting levers 80, 82 provided at their forward ends with flat surfaces 84, 86 for engagement respectively with the tops of the plungers 34, 38 when the levers 80, 82 are rocked downwardly. Each of the levers 80, 82 is provided with a tension spring 88 connected at one end to the extreme rear end of the lever and at the other end to the bracket 76 so that the forward ends of the levers are normally held upwardly away from the positions occupied by the plungers 34, 38 before pressure is applied to the shoe. Adjustable stops, illustrated as screws 90 carried by each of the levers 80, 82, engage projections or lugs 92 formed on the upper end of the bracket 76, thereby limiting the upward movement of the levers.

The levers 80, 82 are connected about midway of their lengths by a rod 94 (Fig. 1) the ends of which are loosely engaged in circular openings formed in the levers. An intermediate lever 96, also pivoted on the fulcrum 78 and held upwardly by a spring 89 secured to the bracket 76, extends forwardly between the levers 80, 82, and carries at its forward end a dog 98 the lower end of which is provided with a semi-cylindrical recess or seat for engaging the rod 94. A screw 91, carried by a downwardly extend arm 95 of the lever 96, engages the bracket 76 to limit upward movement of the lever under the action of the spring 89. The dog 98 is threaded to receive a relatively coarse screw (not shown) formed on or secured to a shaft 100 journaled in an upstanding portion of the lever 96, and a hand wheel 102 is provided to turn the shaft and adjust the dog 98 to the right or left along the rod 94. The relation of the connections between the levers 80, 82 and the intermediate lever 96 is in this way varied so that pressure exerted by the lever 96 will be distributed between the levers 80, 82. A lower arm 97 of the lever 96 is connected to a link 104, the lower end of which is pivotally connected to a reciprocatory rack 106 mounted for vertical sliding movement in ways formed in a casing 108 bolted at 110, 112 and 114 to a casting 111 extending between the legs 12 of the frame of the machine and forming a part of the frame. The upper end of the rack 106 is bifurcated to receive the lower end of the link 104 and a pin 116, having an enlarged portion 118 extending beyond the rack on one side, completes the connection.

A short horizontal shaft 120, extending forwardly and rearwardly of the machine and journaled in bearings in the casing 108 and in a cover plate 109 fastened to the forward end of the casing by screws 122, has a pinion 124 secured thereon near its forward end, the teeth of which mesh with teeth 125 formed on the rack 106 so that when the shaft 120 is rotated in a clockwise direction, as viewed in Fig. 2, the rack will be reciprocated downwardly to lower the levers 80, 82 by means of the link 104 and connections already described. The casing 108 is bored at 127 (Fig. 3) to form an opening to receive the pinion 124, this opening being deep enough to permit a limited amount of longitudinal movement of the pinion 124 and the shaft 120 to which the pinion is secured. Mounted on the shaft 120, rearwardly of the pinion 124, is a multiple disk, friction clutch 126 running in oil, indicated at 128 in the lower portion of the casing 108, and comprising a driving element 130 and a driven element 166, the driving element being continuously rotated from the motor drive of the machine. The continuously rotated clutch element 130 is loosely mounted on the shaft 120 and has a worm gear 131 formed on its periphery for engaging a worm 132 formed on a shaft 134 journaled in bearings formed in a top cover 136 of the casing 108, the shaft 134 being located above the clutch 126 and at right angles to the shaft 120. The cover 136 is secured to the casing 108 by bolts 138 and has horizontal bearings formed therein for supporting the shaft 134, the bearing at the right-hand side of the casing, as viewed in Fig. 2, being large enough to receive a bushing 140 which provides the bearing for that end of the shaft 134. A washer 142 is secured by a screw 144 to this end of the shaft and a thin plate 146 is interposed between the washer and the bushing to prevent excessive wear between the moving parts. Mounted on the other end of the shaft 134, outside the top cover 136, is a gear 148 (Fig. 2) the hub 150 of which is fastened to the shaft by means of a taper pin 152. The inner side of the gear 148 bears against the cover 136 and, with the washer 142, prevents longitudinal movement of the shaft 134. The gear 148 meshes with a large gear 154 of the gearing 62 through which the motor drive of the machine is effected, the ratio between the gears 154 and 148 being such that the gear 148 and worm shaft 134 are rotated considerably faster than the gear 154. The shaft 134 is rotated in a clockwise direction, as viewed in Fig. 3, and the tendency of this action is to force the continuously rotated clutch member 130 forwardly on the shaft 120. A roll 156 is provided to support the member 130 against this action of the worm 132. The roll 156 is rotatably mounted on a stud 158 secured in the casing 108 by a set screw 160 and is arranged to contact with the vertical face of the member 130, as shown in Fig. 3.

The continuously rotating clutch member 130 is hollow or cup-like in shape, as shown in Fig. 3, and inside the cupped-out portion is mounted a series of thin clutch plates or rings 160, seven plates being used in the present instance, which are keyed to the inner horizontal wall of the clutch member by keys 162, 164 so that they will rotate with this member. The driven element 166 of the clutch 126 comprises a hub 168 secured to the shaft 120 by a key 170 and abutting against a shoulder 172 formed by an enlarged section 174 of the shaft 120, so that longitudinal movement of the shaft inwardly or to the right, as viewed in Fig. 3, will force the clutch member 166 inwardly. The member 166 is provided with an annular shoulder or ledge 167 which projects inwardly from the main portion of the clutch member, the shoulder being located about midway between the shaft 120 and the

periphery of the clutch member. On this shoulder 167 is mounted another series of clutch plates or rings 176, similar to those keyed to the clutch member 130 except that the plates 176 are smaller in diameter. The plates 176 are arranged to enter the spaces between the plates 160 so that each series will have the greater portions of the vertical surfaces of each plate located only a few thousandths of an inch away from adjacent surfaces of the plates of the other series when the clutch is in its inoperative position, as shown in Fig. 3. The continuously rotating clutch member 130, therefore, is free to rotate without affecting the clutch member 166 while the parts remain in this position. The plates 176 are secured to the member 166 by keys 178 and 180 so that when they are forced into contact with the plates 160 by longitudinal movement of the member 166 the latter will be rotated to rotate the shaft 120. The clutch plates are supplied with oil 123 from the bottom of the casing 108 through openings 165 in the clutch member 130 and through the space between the inner and outer clutch members, thereby reducing the wear on the clutch plates.

Fulcrumed on a stud 182 (Fig. 1) carried by a pair of ears 184 depending from the lower portion of the casing 108 is a treadle lever 186, curving downwardly from its pivot and extending forwardly on a gradual upward incline through an opening in the frame 111. The treadle is held in inoperative position against a stop formed on the frame by a tension spring 187, the upper end of which is fastened to the frame by a screw. An inclined opening 188 is provided in the downwardly curved portion of the treadle 186 and a horizontal pin 190, extending transversely through the opening 188 below and somewhat in front of the fulcrum 182, forms a pivot for one end of a forwardly projecting rod 192, the forward portion of which is reduced in diameter and passes through a hole in a horizontal stud 200 pivotally mounted in ears formed on the lower end of a downwardly extending lever 202. The lever 202 is fulcrumed on a pin 204 mounted on a lug 206 projecting rearwardly from the upper portion of the frame 111. A fairly heavy compression spring 194 surrounds the reduced portion of the rod 192 being held thereon by a pair of washers 195 and 196. The forward washer 195 abuts against an adjusting nut 197 threaded on the end of the rod and held in adjusted position by a lock nut 198. The washer 196, which confines the inner end of the compression spring 194, engages a flatted surface formed on the horizontal pin 200 carried by the lever 202. Another flatted surface formed on the opposite side of the pin 200 abuts against a shoulder formed at the reduced portion of the rod 192. The spring 194 tends normally to force the pin 200 and lever 202 firmly against the shoulder on the rod 192, thus positioning the lever 202 and holding it in position when the machine is at rest. The fulcrum 204 of the lever 202 is located in front of and a considerable distance above the fulcrum 182 of the treadle lever 186 and this lever is so positioned that it will be located centrally with respect to the forward end of the clutch shaft 120. When the treadle is depressed the pivot 190 of the rod 192, is swung inwardly toward the rear of the machine to cause the rod 192 to be carried rearwardly. As the rod 192 moves rearwardly the compression spring 194 forces the lever 202 inwardly about its pivot 204 until the lever can move no further, after which the spring 194 compresses to permit further movement of the treadle 186. The tension of the spring 194 may be varied by adjusting the nuts 197, 198, thereby varying the amount of pressure which must be exerted on the treadle before the spring will start to compress.

Adjustably mounted in a circular recess in the lever 202, at a point directly opposite the center of the forward end of the shaft 120, is a hardened steel plug 208 (Fig. 3) arranged to engage a button 210 in the end of the shaft 120, the plug 208 and button 210 forming points of contact between the shaft 120 and the pivoted lever 202. The plug 208 may be adjusted in the recess and is supported in position against the thrust resulting from its contact with the button 210 by an adjustable screw 212 threaded in the lever 202. The screw 212 is locked in adjusted position by a lock bushing 214 threaded on the screw and bearing against the lever 202, the bushing 214 being provided with a hexagonal head 216 for turning the bushing to lock the screw 212 in position.

Fulcrumed on a pin 218 (Fig. 1) carried by a pair of ears projecting rearwardly from the upper portion of the frame 111 is a substantially horizontal lever 220 one arm of which extends rearwardly and has its inner end extending under and in contact with the projecting portion 118 of the pin 116 which connects the rack 106 with the lower end of the link 104. The upper surface of the inner end of the lever 220 which extends under the pin 116 is inclined in such a manner that the lever will remain in contact with the pin when the parts are below the position shown in Figs. 1 and 3. A forward arm of the lever 220 extends through an opening in the frame and has a downwardly extending rod 222 pivotally connected to its outer end, the rod passing through a hole formed in a forward portion of the treadle 186 and having a stop nut 224 and a lock nut 226 threaded on its lower end. The nuts 224, 226 are adjustable on the rod 222 and serve to limit downward movement of the treadle 186.

In the operation of the machine the operator, after positioning a sole and shoe on a pad box with the aid of the positioning mechanism previously referred to, depresses the treadle 186 to move the rod 192 inwardly. The spring 194, having been tensioned beforehand to exert a predetermined pressure before compressing, will rotate the lever 202 inwardly about its pivot 204, to bring the plug 208 into engagement with the button 210 on the end of the clutch shaft 220. Since the bore 127 in the casing 108 is deep enough to permit a limited longitudinal movement of the pinion 124, the pressure exerted by the lever 202 against the end of the shaft 120 forces the shaft to slide longitudinally in its bearings to press the clutch plates 176 of the clutch member 166 forcibly against the plates 160 of the continuously rotating clutch member 130. A ball bearing 228 is interposed between the hub of the member 130 and the inside wall of the casing 108 to take the thrust of the pressure exerted against the clutch members and to permit rotation thereof without excessive friction.

Upon engagement of the clutch plates 160, 176 the clutch member 166 is caused to rotate, thereby rotating the shaft 120 to which this member is keyed. Rotation of the shaft 120

causes the pinion 124, the teeth of which mesh with the teeth 125 of the rack 106, to lower the rack and, through the link 104 and the adjustable dog 98 connecting the lever 96 with the rod 94, to carry the levers 80, 82 downwardly until they engage respectively with the plungers 34, 38 which are arranged to contact with the cone of the last and the forepart of the shoe resting on the pad. The dog 98 may be adjusted so that the levers 80, 82 will distribute the pressure in the desired manner as they force the shoe and sole into the upper surface of the pad.

While the levers 80, 82 are being lowered to bring the plungers into engagement with the last and shoe, the pin 116 is moving downwardly to rock the lever 220 about its pivot 218. The forwardly projecting arm of the lever 220 is thus elevated to move the rod 222 and the nuts 224, 226 upwardly. The stop nuts 224, 226 will continue to move upwardly as long as the rack 106 is being moved downwardly through the operation of the clutch. In the normal operation of the machine when the treadle 186, which is being depressed by the operator, contacts with the stop nuts further downward movement of the treadle is prevented, thus preventing further pressure being applied to the clutch elements 130, 166. The position to which the stop nuts are raised is dependent upon the size of the shoe being operated upon, because the downward movement of the levers 80, 82, which contact with the top of the last and shoe, determines the downward movement of the rack 106 which elevates the stop nuts. It will be seen, therefore, that the position of the top of the last controls the position of the stop nuts 224, 226 which limit depression of the treadle. Consequently, the pressure applied by the clutch-operated mechanism to the shoe and sole is limited by the position of the stop nuts. This position will vary as the sizes of the shoes vary or, in other words, as the heights of the lasts and bottom areas of the shoes vary. By this arrangement the pressure applied to each shoe and sole will be substantially the same for each unit of area of the shoe bottom irrespective of the size of the shoe.

If a condition should arise where a shoe of one style should take a last which is the same height as the last for a shoe of another style, but the latter shoe should have a bottom area different from the former, the mechanism will nevertheless operate to cause substantially the same amount of pressure to be applied per unit of bottom area to each shoe regardless of the equal heights of the lasts. Under the above conditions, the shoe having the greater bottom area will obviously require more pressure to sink it a given distance into the pad than will be required to sink the shoe with the smaller bottom area the same distance into the pad, since the larger shoe will cover a greater portion of the pad. The larger shoe, however, does not have to be sunk so far into the pad as the smaller shoe in order to produce the same amount of pressure for each unit of its bottom area. While the levers 80, 82 are being moved into contact with the top of the last of the larger shoe, the rack 106 is descending to raise the stop nuts. After the levers have contacted with the last and shoe and have commenced to apply pressure to the shoe, the rack will continue to descend. The distance the larger shoe will sink into the pad under a given amount of pressure on the treadle, however, will be less than the distance the smaller shoe will be sunk under the same pressure and, consequently, the rack 106 will not descend as far as it would for the smaller shoe and the stop nuts will not be elevated as high. This leaves more space for the treadle to be depressed so that more pressure may be applied to the clutch elements when operating on the larger shoe. When more pressure is applied by the treadle-operated mechanism to the clutch elements they actuate the rack 106 and levers 80, 82 to apply greater pressure to the larger shoe. The arrangement of the mechanism is such that, regardless of the styles of the shoes or the heights of the lasts in the shoes, the pressure applied will be substantially proportional to the size of the shoe being operated upon.

If the lasts in some instances are not graded exactly proportional to the sizes of the shoes which are being operated upon, as where different styles of shoes have different bottom areas but take lasts of the same heighths, the position to which the stop nuts are elevated will nevertheless be determined in accordance with the size of the shoe on the pad since this position is controlled not only by the height of the last but also by the bottom area of the shoe. When the resistance of the shoe and sole to the pressure of the levers 80, 82 overcomes the pressure being applied by the treadle-operated mechanism to the clutch elements 130, 166, the clutch plates slip, thus preventing further downward movement of the rack 106 and further pressure being applied to the shoe and sole.

As already pointed out, the pressure exerted on the clutch elements by the treadle-operated mechanism is applied yieldingly through the action of the compression spring 194. Accordingly, the tention of this spring is what actually determines the pressure applied by the treadle to hold the clutch plates in driving engagement with each other. The spring 194, therefore, should be tensioned beforehand until it will exert sufficient pressure against the clutch members 130, 166 to cause the desired preliminary pressure to be applied to the shoe and sole before the spring 194 starts to compress. The mechanism is so constructed and arranged that the levers 80, 82, will apply a preliminary pressure of approximately 20 pounds to the square inch to the shoe bottom before the treadle contacts with the stop nuts and the clutch plates begin to slip. Since the preliminary pressure per unit of area of the shoe bottom is substantially the same for all shoes irrespective of their sizes it follows that the distance which each shoe is sunk into the pad will be substantially the same, slight allowances being made, of course, for the variations in the stretch of the rubber at different portions of the pad when operating on different sized shoes.

If the treadle should be depressed suddenly to its lowermost position before sufficient time has elapsed to permit the clutch-operated mechanism to position the stop nuts 224, 226 properly, the mechanism is constructed and arranged to operate in such a manner that only the desired pressure will be applied to the shoe and sole. If the treadle is depressed immediately to its lowermost position against the stop nuts 224, 226, the rack 106 will descend as before to lower the levers 80, 82 and press the plungers 34, 38 into engagement with the last and shoe. As the rack descends it will rock the lever 220 to elevate the rod 222 and stop

nuts **224**, **226** and, during its upward movement, the stop nuts will forcibly elevate the treadle until the pressure exerted thereby on the clutch members is reduced sufficiently to cause the clutch-operated mechanism to apply only an amount of pressure which is appropriate for the size of the shoe being operated upon. Thus it will be seen that, regardless of the manner in which the treadle is actuated by the operator, a preliminary pressure will be applied to the shoe and the sole which is proportional to the size of the shoe and which will sink the shoe and sole into the pad the required distance irrespective of the size of the shoe being operated upon.

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

1. A machine for use in the manufacture of shoes having, in combination, a pad for supporting a shoe and sole, and power-operated means for pressing the shoe and sole together on the pad, said means being constructed and arranged automatically to vary the pressure substantially in accordance with the size of the shoe operated upon.

2. A machine for use in the manufacture of shoes having, in combination, a pad for applying pressure to a shoe and sole, and means for pressing the shoe and sole against the pad, said means being constructed and arranged automatically to press each shoe and sole against the pad with a force which varies in proportion to the size of the shoe operated upon.

3. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a shoe and sole, and power-operated means for pressing the shoe and sole against said pad thereby sinking them into the pad, said means being constructed and arranged automatically to apply a pressure which will sink every shoe and sole operated upon substantially the same distance into the pad irrespective of the sizes of the shoes.

4. A machine for use in the manufacture of shoes having, in combination, a flexible pad for supporting a shoe and sole, and power-operated means for pressing the shoe and sole against a surface of said pad, said means being constructed and arranged automatically to vary the pressure applied to shoes of different sizes so that substantially the same pressure per unit of bottom area will be applied to each shoe, thereby sinking each sole and shoe a uniform distance into the pad.

5. A machine for use in the manufacture of shoes having, in combination, a flexible pad for supporting a shoe and sole, and power-operated means for preliminarily pressing the shoe and sole against the supporting surface of the pad, said means being constructed and arranged automatically to limit the preliminary pressure in accordance with the size of the shoe being operated upon, thereby applying substantially the same preliminary pressure to a large shoe in proportion to its bottom area as is applied to a small shoe in proportion to its bottom area.

6. A machine for use in the manufacture of shoes having, in combination, a pad for supporting a shoe on a last and a sole, and means for applying pressure to the shoe and sole supported on said pad, said means being constructed and arranged to apply pressure to each shoe and sole which is automatically limited by the heightwise position of the top of the last in the shoe being operated upon.

7. A machine for use in the manufacture of shoes having, in combination, a pad for supporting a shoe and a sole, and power-operated means for applying preliminary pressure to the shoe and sole, said means being constructed and arranged automatically to apply substantially the same preliminary pressure per unit of bottom area to each shoe operated upon irrespective of the size of the shoe.

8. A machine for use in the manufacture of shoes having, in combination, a pad for supporting a shoe and sole, power-operated means for applying preliminary pressure to the shoe and sole, said means being constructed and arranged automatically to vary the pressure applied to different sized shoes substantially in accordance with the size of the shoe operated upon, and means for applying final pressure to the sole and shoe.

9. A machine for use in the manufacture of shoes having, in combination, a flexible pad for receiving a shoe and sole, power-operated means for preliminarily pressing the shoe and sole against a wall of said pad, said means being constructed and arranged automatically to apply to each shoe operated upon preliminary pressure which is substantially the same for each unit of area of the shoe bottom irrespective of the size of the shoe, and means for distorting another wall of said pad to apply final pressure to the shoe and sole.

10. A machine for use in the manufacture of shoes having, in combination, a pad arranged to receive a shoe and sole, power-operated means for engaging the shoe to apply pressure thereto, and means constructed and arranged, upon engagement of said power-operated means with the shoe, automatically to limit the pressure applied to the shoe by said power-operated means.

11. A machine for use in the manufacture of shoes having, in combination, a yieldable pad arranged to receive a shoe and a sole, power-operated means for pressing the shoe and sole into said pad, and means movable automatically to cause said power-operated means to vary the pressure applied to the shoe substantially in accordance to the size of said shoe, thereby pressing the shoe and sole the required distance into the pad.

12. A machine for use in the manufacture of shoes having, in combination, a pad arranged to receive a shoe on a last and a sole, means for pressing the shoe and sole against the pad, and power-operated means for actuating said pressing means, said power-operated means being constructed and arranged automatically to cause said pressing means to exert a pressure on each shoe which is determined by the height of the last in said shoe.

13. A machine for use in the manufacture of shoes having, in combination, a yieldable pad arranged to receive a shoe on a last and a sole which is to be attached to said shoe, means for applying pressure to the shoe and sole, said means being movable into and out of engagement with the shoe and last mounted on said pad, and power-operated means for moving said pressure-applying means into engagement with the last and shoe and by the extent of movement of said pressure-applying means automatically determining the pressure which is applied to the shoe and sole.

14. A machine for use in the manufacture of shoes having, in combination, a flexible pad for

supporting a shoe and sole, power-operated means for pressing the shoe and sole against said pad, said means being constructed and arranged automatically to vary the pressure substantially in accordance with the size of the shoe, thereby sinking the sole and shoe a suitable distance into the pad, and means for applying final pressure to the sole and shoe.

15. A machine for use in the manufacture of shoes having, in combination, a flexible pad for supporting a shoe on a last and a sole, power-operated means for preliminarily pressing the shoe and sole against the pad, said means being constructed and arranged automatically to vary the pressure substantially in accordance with the size of the shoe being operated upon, thereby applying substantially the same pressure per unit of bottom area to each shoe irrespective of its size and sinking each shoe and sole approximately the same distance into the pad, and means for applying a final pressure to the sole and shoe while held in such position.

16. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for receiving a shoe on a last and a sole, means for applying pressure to the shoe and sole, and power-operated mechanism for actuating said pressure applying means, said mechanism being constructed and arranged first to move the pressure applying means into engagement with the last and shoe and thereafter to cause said means to apply pressure to the shoe and sole the amount of which is automatically determined by the height of the last engaged by said pressure applying means and by movement of the last in response to the pressure applying action.

17. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a shoe on a last and a sole, a pair of levers for engaging the shoe and last to cause pressure to be applied to the shoe and sole, power-operated means including a friction clutch for actuating said levers, treadle-operated means for holding the clutch in driving engagement, and means automatically set in accordance with the size of the shoe to limit movement of said treadle-operated means to permit the clutch to be held in driving engagement with a force which will cause greater pressure to be applied to a large shoe than to a small shoe.

18. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a sole and a shoe to which the sole is to be attached, a lever for pressing the sole and shoe against the pad, a friction clutch for actuating said lever, and means including intermediate connections between the lever and the clutch whereby the former is caused to press the sole and shoe against the pad with a pressure which is substantially the same for each unit of area of the shoe bottom irrespective of the size of the shoe operated upon.

19. A machine for use in the manufacture of shoes having, in combination, a yieldable pad arranged to receive a shoe on a last and a sole, power-operated means for applying pressure to the sole and shoe, said means comprising a pair of levers, a friction clutch, and connections between the levers and the clutch whereby the latter actuates the levers to apply pressure to the sole and shoe, means for setting the clutch to actuate said levers, and means for automatically limiting the pressure applied to set the clutch in accordance with the height of the last in the shoe.

20. A machine for use in the manufacture of shoes having, in combination, a yieldable pad arranged to support a shoe and a sole, a plurality of levers for applying pressure to the shoe and sole supported on said pad, a friction clutch comprising a driving element and a driven element for actuating said pressure applying levers, and treadle operated means for pressing the clutch elements yieldingly into driving engagement, said means being constructed and arranged gradually to increase the force exerted on the clutch elements until the desired pressure is applied to the shoe and sole after which the clutch elements will slip.

21. A machine for use in the manufacture of shoes having, in combination, a yieldable pad arranged to receive a shoe and sole, a pair of levers for applying pressure to the shoe and sole, a friction clutch including a driving element and a driven element for actuating said levers, said clutch being constructed and arranged to actuate said levers until the desired pressure is attained, after which the clutch elements will slip, treadle-operated means for applying pressure to set the clutch, and means for automatically limiting the pressure applied to set the clutch so that it will cause the pressure applying levers to apply only the desired pressure to the shoe and sole before the clutch elements begin to slip.

22. A machine for use in the manufacture of shoes having, in combination, a yieldable pad constructed and arranged to receive a shoe and a sole, a pair of levers for applying pressure to the shoe and sole, a friction clutch for actuating said levers, said clutch comprising a driving element and a driven element which are held in frictional engagement until the pressure on the shoe and sole overcomes the force of the clutch elements after which the elements will slip, treadle-controlled means for forcing the clutch elements into said frictional engagement, and means for limiting the pressure which may be applied to said treadle-controlled means to hold the clutch elements in such engagement, said limiting means being controlled automatically by the size of the shoe operated upon, thereby limiting the pressure applied to the shoe and sole in accordance with the size of the shoe.

23. A machine for use in the manufacture of shoes having, in combination, a yieldable pad constructed and arranged to receive a shoe on a last and a sole, a pair of levers for applying initial pressure to the shoe and sole, power-operated means including a friction clutch for actuating said levers, treadle-controlled means for applying pressure to set the clutch, said clutch being constructed and arranged to actuate said levers until the resistance of the shoe and sole to the pressure applied thereto overcomes the pressure holding the clutch set, after which the clutch will slip and cease to apply additional pressure, means for automatically limiting the pressure applied to the clutch substantially in accordance with the position of the top of the last in the shoe, thereby varying the pressure applied to shoes of different sizes substantially in accordance with the size of the shoe being operated upon, and means for applying final pressure to the shoe and sole.

24. A machine for use in the manufacture of shoes having, in combination, a yieldable pad

arranged to receive a shoe and a sole, a pair of levers for applying preliminary pressure to the shoe and sole, a friction clutch for actuating said levers, said clutch being constructed and arranged to actuate said levers until the resistance of the shoe and sole to the pressure of the levers overcomes the friction of the clutch after which the clutch will slip, and treadle-operated means for applying pressure to the clutch to actuate said pressure applying levers, said means being constructed and arranged automatically to limit the pressure applied to the clutch in accordance with the size of the shoe being operated upon, thereby causing said pressure applying levers to apply substantially the same amount of preliminary pressure per unit of bottom area to a large shoe as to a small shoe.

25. A machine for use in the manufacture of shoes having, in combination, a yieldable pad constructed and arranged to receive a shoe and a sole, means for applying pressure to the shoe and sole, a friction clutch including a driving element and a driven element for actuating said pressure applying means, said clutch elements being constructed and arranged to remain in operative engagement with each other until the resistance of the shoe and sole to the pressure of the power-operated means overcomes the force holding the clutch elements in operative engagement, after which the elements will slip, treadle-operated means for forcing the clutch elements into operative engagement, and means for limiting the pressure which may be applied to hold the clutch elements in such engagement, said means including a variable stop the position of which is automatically determined by the height of the last in the shoe being operated upon.

26. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a shoe and a sole, a rotatable shaft, a friction clutch mounted on said shaft, pressure applying means actuated by said clutch, said clutch being constructed and arranged to be set by longitudinal movement of said shaft and to remain set until sufficient resistance is offered to the pressure applying means to overcome the pressure holding the clutch set, means for moving the shaft longitudinally to set the clutch, and means for varying the pressure by which the shaft is so moved, said means being controlled automatically in accordance with the size of the shoe operated upon.

27. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a shoe and a sole, a rotatable shaft, a friction clutch having driving and driven elements mounted on said shaft, levers operated by said clutch and movable toward and away from the pad for applying pressure to the sole and shoe supported on said pad, manually operated means for relatively moving said clutch elements to cause operation of the pressure-applying levers, and means actuated by movement of the pressure-applying levers toward the pad for offsetting the force applied to the clutch and thereby limiting the driving power of the driven element of said clutch.

28. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a shoe and a sole, a rotatable shaft, a friction clutch mounted on said shaft, pressure-applying means operated by said clutch and constructed and arranged to apply pressure to the sole and shoe, said clutch comprising driving and driven elements, the driven element operating said pressure-applying means after the clutch is set and continuing to operate said means until sufficient resistance is exerted by the shoe and sole to offset the force holding the clutch elements in driving engagement, and manually-operated means for effecting relative movement of the clutch elements to set the clutch, said means being adjustable to vary the pressure exerted on the clutch elements, thereby to vary the pressure applied to the shoe and sole.

29. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a shoe on a last and a sole, a rotatable shaft, driving and driven clutch elements mounted on said shaft, means operated by said clutch elements for applying pressure to the shoe and sole, said clutch elements being constructed and arranged to cause the pressure-applying means to apply pressure to the shoe and sole after the driven element has been moved into engagement with the driving element by longitudinal movement of the rotatable shaft on which the elements are mounted and to cause said means to increase the pressure until sufficient resistance is offered by the shoe and sole to offset the force holding the clutch elements in driving engagement after which the elements will slip, treadle-operated means for exerting pressure yieldingly on said shaft to effect longitudinal movement thereof and force the clutch elements into driving engagement, and means for automatically limiting the operation of said treadle-operated means substantially in accordance with the height of the last in the shoe being operated upon.

30. A machine for use in the manufacture of shoes having, in combination, a yieldable pad arranged to receive a shoe and a sole, means for applying pressure to the shoe and sole, a friction clutch for operating said pressure-applying means, said clutch being constructed and arranged to be set by pressure and to cause a pressure to be applied to each shoe and sole which is proportional to the pressure applied to set the clutch, treadle-controlled means for setting the clutch, and means for automatically limiting the action of said treadle-controlled means substantially in accordance with the size of the shoe being operated upon so that the pressure applied to the shoe and sole will be substantially proportional to the size of said shoe.

31. A machine for use in the manufacture of shoes having, in combination, a yieldable pad to receive a shoe on a last and a sole, a pair of levers for applying pressure to the shoe and sole, a friction clutch for actuating said pressure-applying levers, said clutch being constructed and arranged to cause said levers to apply an increasing pressure until sufficient resistance is offered thereto by the shoe and sole to offset the force exerted to hold the clutch set, after which the clutch will slip, treadle-controlled means for setting the clutch, and means for automatically limiting the movement of said treadle-controlled means substantially in accordance with the height of the last in the shoe being operated upon, so that the pressure exerted against the clutch will be determined by the height of said last and thus limit the pressure applied to the shoe and sole substantially in accordance with the size of the shoe, said

means being also arranged automatically to return the treadle forcibly to a predetermined position if it should be forced beyond this position before the limiting means is operated, thereby assuring that the pressure applied to the shoe and sole will be limited substantially in accordance with the size of the shoe, irrespective of the manner in which the treadle is operated.

32. A machine for use in the manufacture of shoes having, in combination, a yieldable pad arranged to receive a shoe and a sole, levers for applying pressure to the shoe and sole, power-operated means for actuating said levers, said means comprising a rotatable shaft, a clutch for rotating said shaft, a pinion mounted on said shaft, a reciprocatory rack meshing with said pinion, and a link connecting said rack with the pressure-applying levers, treadle-controlled means for applying pressure to said power-operated means, and means for limiting the pressure applied by said treadle-controlled means, said limiting means being operated automatically by movement of the rack during the pressure-applying operation.

33. A machine for use in the manufacture of shoes having, in combination, a hollow vessel containing fluid and arranged to receive a shoe and sole, power-operated means for applying preliminary pressure to the shoe and sole, and means for thereafter applying final pressure to the shoe and sole, said power-operated means being constructed and arranged to operate automatically in such a manner that the pressure applied to the shoe and sole will be substantially the same for each unit of area of the shoe bottom irrespective of the size of the shoe.

34. A machine for use in the manufacture of shoes having, in combination, a hollow vessel containing fluid and arranged to receive a shoe and a sole, power-operated means for applying preliminary pressure to the shoe and sole, and power-operated means for applying final pressure to the shoe and sole, said first-named means being constructed and arranged automatically to control the pressure substantially in accordance with the bottom area of the shoe operated upon, thereby applying a preliminary pressure which is greater for a large shoe than for a small shoe by an amount substantially proportional to the difference in size between the large shoe and the small shoe.

35. A machine for use in the manufacture of shoes having, in combination, a hollow vessel containing fluid and arranged to receive a shoe and a sole, means for applying preliminary pressure to the shoe and sole, said means being operated by power transmitted through a clutch to said pressure applying means, means for actuating the clutch in such a manner that the pressure applying means will be caused automatically to apply a preliminary pressure which averages substantially the same for each unit of area of the shoe bottom irrespective of the size of the shoe operated upon, and power-operated means for applying final pressure to the shoe and sole.

36. A machine for use in the manufacture of shoes having, in combination, a pad for supporting a shoe and a sole, power-operated means for applying pressure to the shoe and sole, said means being constructed and arranged automatically to limit the pressure substantially in accordance with the size of the shoe operated upon, and means for maintaining the pressure applied by said power-operated means.

37. A machine for use in the manufacture of shoes having, in combination, a pad for supporting a shoe on a last and a sole, power-operated means for applying pressure to the shoe and sole, a friction clutch for actuating said power-operated means, said clutch being constructed and arranged to cause said power-operated means to operate until the pressure on the shoe and sole reaches an amount which is determined by the height of the last in said shoe after which the clutch will slip, and means for maintaining said pressure.

38. A machine for use in the manufacture of shoes having, in combination, a yieldable pad for supporting a shoe and a sole, power-operated means for applying preliminary pressure to the shoe and sole, a friction clutch for causing said power-operated means to apply increasing pressure until the sole and shoe have been pressed into the pad the required distance, and spring-pressed pawls for automatically maintaining the preliminary pressure thus applied.

39. A machine for use in the manufacture of shoes having, in combination, a pad for supporting a shoe and a sole, a pair of levers for applying preliminary pressure to the shoe and sole, a friction clutch comprising driving and driven elements for actuating said pressure applying levers, said clutch being constructed and arranged to cause said levers to exert a preliminary pressure on the shoe and sole which varies proportionately with the pressure exerted to force the clutch elements into driving engagement, means for forcing the clutch elements into said driving engagement, adjustable means for automatically varying the pressure applied to said clutch elements in accordance with the size of the shoe being operated upon, thereby causing the preliminary pressure to vary proportionately with the pressure applied to said clutch elements, means for automatically maintaining the preliminary pressure applied by said levers, and means for applying final pressure to the shoe and sole.

WILLIAM D. THOMAS.