Nov. 18, 1947. C. A. ROBINSON ET AL 2,430,889

SHOE MACHINE

Filed July 18, 1945 2 Sheets-Sheet 1

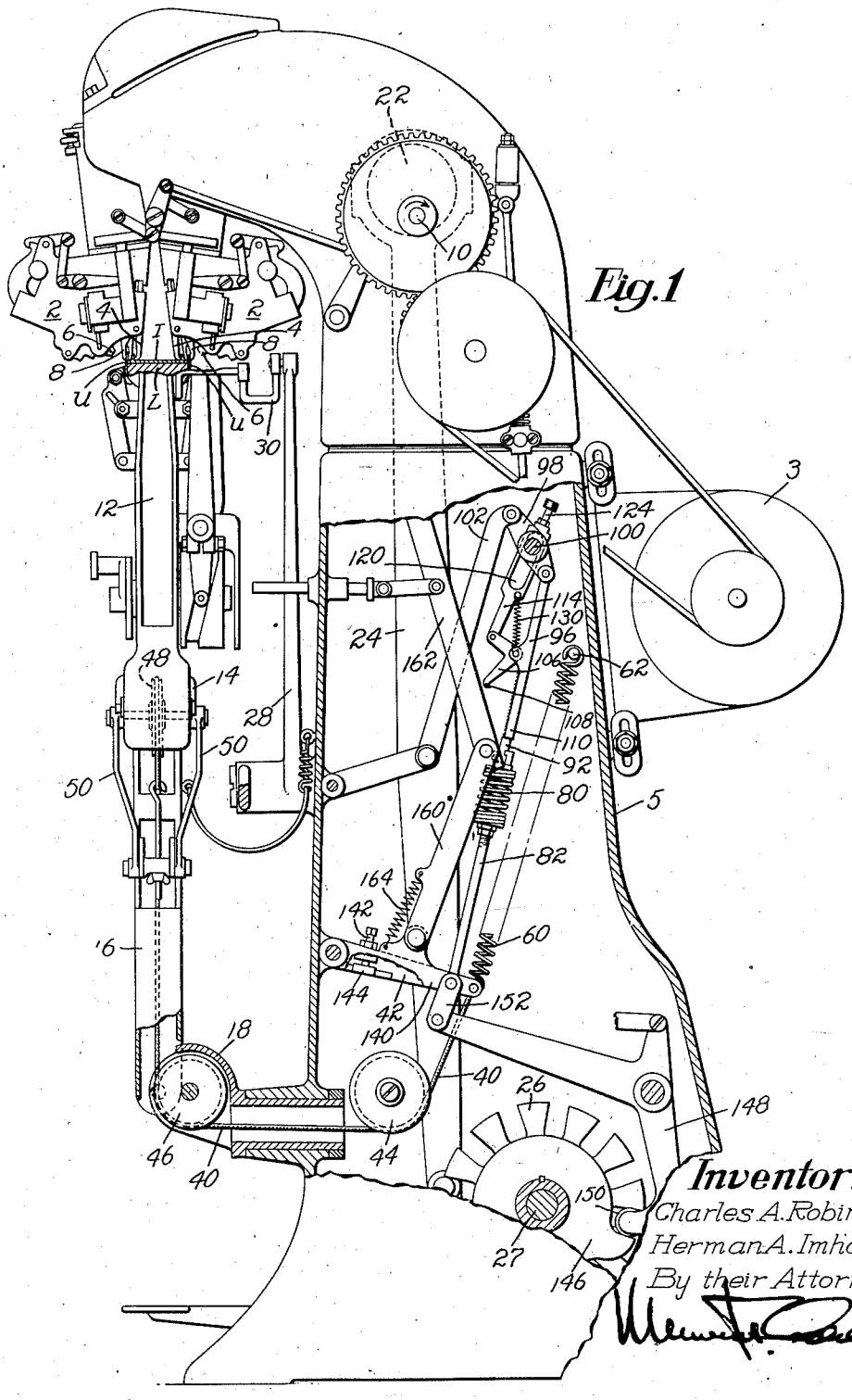


Fig. 1

Inventors
Charles A. Robinson
Herman A. Imhof
By their Attorney

Nov. 18, 1947. C. A. ROBINSON ET AL 2,430,889

SHOE MACHINE

Filed July 18, 1945 2 Sheets-Sheet 2

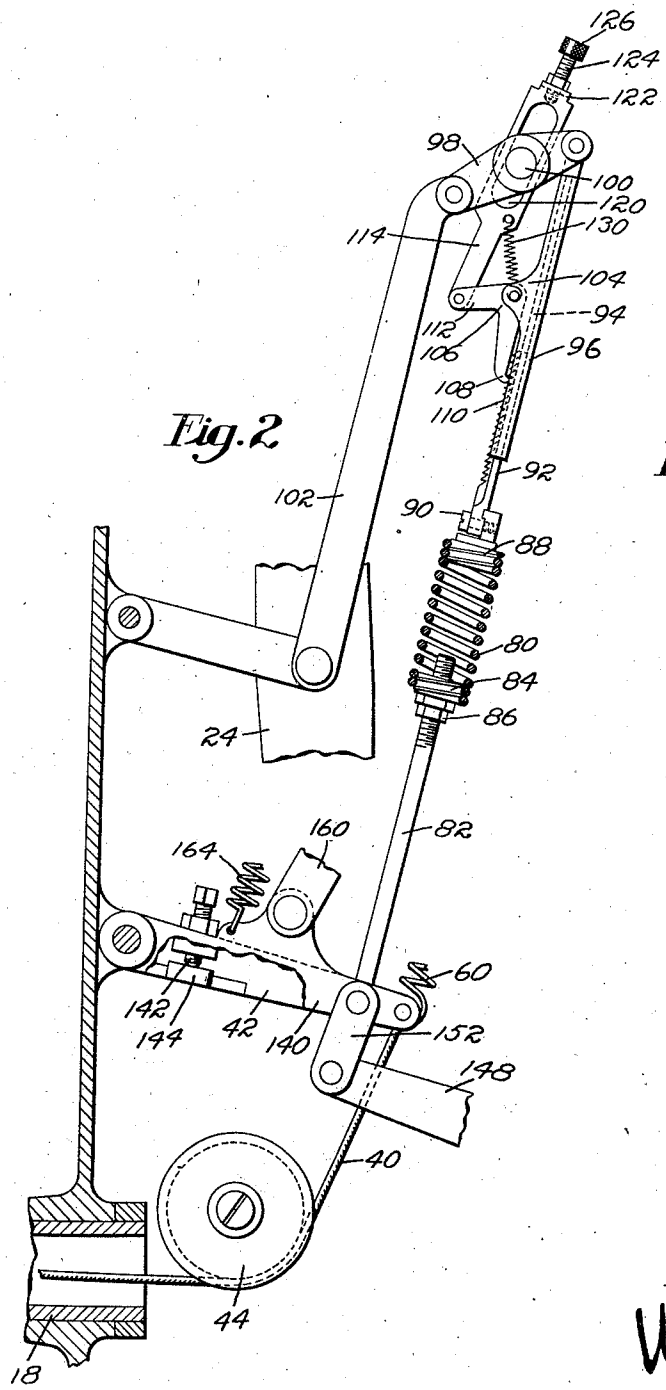


Fig. 2

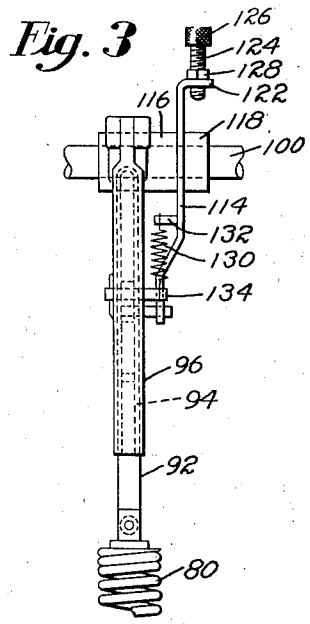


Fig. 3

Inventors

Charles A. Robinson

Herman A. Imhof

By their Attorney

Patented Nov. 18, 1947

2,430,889

UNITED STATES PATENT OFFICE

2,430,889

SHOE MACHINE

Charles A. Robinson, Salem, and Herman A. Imhof, Beverly, Mass., assignors to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application July 18, 1945, Serial No. 605,696

10 Claims. (Cl. 12—4)

1

This invention relates to machines for use in the manufacture of shoes, and is herein illustrated as embodied in a machine of the type disclosed in United States Letters Patent No. 2,201,866, issued on May 21, 1940, on an application filed in the name of Robert H. Lawson. It is to be understood, however, that this invention is not limited to use in a machine organization of the exact character of this prior disclosure.

Machines of the type to which this invention relates are, as exemplified by the machine of the mentioned patent, provided with devices for operating on the marginal portion of a shoe supported on a jack, progressively along the edge of the shoe as the point of operation is shifted by relative movement of the jack and the devices. Specifically, the machine of the patent referred to has intermittently operating devices for lasting the upper progressively along the sides of a shoe, each of these devices including upper tensioning means, upper securing means and a guiding presser-foot for engaging the bottom of the shoe; and a shoe-supporting jack that is movable, in time relation to the operation of the lasting devices for shifting the shoe to transfer the point of operation along the marginal edge of the shoe. This machine also has spring means for exerting upward pressure on the jack to hold the bottom of the shoe yieldingly against the guiding presser-feet, as the shoe is being shifted, together with mechanism for causing the spring means to exert an additional upward pressure on the jack so that the bottom of the shoe is held more firmly against the guiding presser-feet during the operation of the lasting devices, and particularly during the action of their upper securing means which are movable inwardly from the edges of the shoe with a component of movement toward the shoe bottom, in order that the shoe may not be displaced vertically and moved out of engagement with the guiding presser-feet by the upper securing means.

An object of the invention is to provide, in a machine of the type mentioned, novel and improved mechanism for so exerting upward pressure on a jack that the bottom of a shoe supported thereon is urged yieldingly, at times with a relatively light pressure and at other times more firmly, upward and against guiding presser-feet associated with devices for operating on the shoe. With this purpose in view, and in accordance with a feature of this invention, the herein-illustrated machine is provided with a spring means for supporting the entire weight of the jack and shoe supported thereon, and for holding the bottom

2

of the shoe yieldingly, and with a relatively light pressure, against the guiding presser-feet and also with mechanism, separate from the spring means, for applying additional upward pressure on the jack to hold the shoe more firmly against the guiding presser-feet during the periods of operation of the devices. Invention is also to be recognized in the provision of manually operable means for selectively varying the amount of additional pressure applied to the jack. More specifically, the mechanism for applying additional pressure to the jack comprises a spring which is operatively connected at one end to the jack and means operable in time relation to the action of the devices for operating on the shoe, for connecting the opposite end of the spring to a moving part of the machine in such a way that the spring is tensioned by the movement of said part. Preferably and as herein illustrated, this connecting means includes a pawl arranged to engage a ratchet bar secured to one end of the spring and manually adjustable means are provided for selectively timing the engagement of the pawl with the ratchet bar to vary the extent the spring is tensioned by the moving part and, as a result, the amount of additional pressure that is applied to the jack.

The above and other objects and features of this invention will become apparent from the following detailed description of the preferred embodiment thereof disclosed in the accompanying drawings and will be pointed out in the claims.

In the drawings,

Fig. 1 is a view in side elevation of a machine embodying the features of this invention, certain portions of the machine being broken away to simplify the disclosure; and

Figs. 2 and 3 are views, on an enlarged scale, of elements of the machine shown in Fig. 1.

Referring to the drawings, the illustrated machine, which with exception of the mechanism for applying upward pressure on the jack, to be described below, is substantially the same as the machine disclosed in the above-mentioned patent, is provided with intermittently operating devices indicated at 2 for lasting the upper along the opposite sides of a shoe, each comprising a support carrying a guiding presser-foot 4, an upper securing device 6 and an upper tensioning gripper 8, see Fig. 1. These units are operated in exactly the same manner as, and by mechanism similar to, that of the machine disclosed in the above-mentioned patent, and including an operating cam shaft 10, which is shown as being

driven, in the direction of the arrow, from a motor 3 supported on the machine frame 5.

As in the machine of the prior patent, the shoe, consisting of an upper U and an insole I assembled on a last L, is supported with its bottom face held against the guiding presser-feet 4 by means of a jack, including a shoe supporting frame member 12 that is pivotally mounted, at its lower end, on a horizontally extending link 14. This link is likewise pivotally mounted on a vertically extending arm 16, and this arm is itself pivotally mounted on a base member 18 that is rotatably supported in the machine frame 5. The construction and arrangement of this jack are exactly the same as that disclosed in the prior patent to which reference may be had for a complete description of the details thereof, and, during the operation of the machine, the jack is moved, in time relation to the action of the lasting devices, to shift the shoe in a lengthwise direction relative to the lasting devices in the same manner as in the prior machine, and by similar mechanism including the operating cam shaft 10, an eccentric 22 secured to the operating shaft, an oscillating and vertically movable lever 24 associated with the eccentric, a notched disk 26 which is operatively connected by mechanism not shown but similar to that in the mentioned prior patent and including a pattern cam shaft 27, to a bell crank lever 28 from the upper end of which an operating link 30 extends to the jack frame part 12.

For exerting upward pressure on the jack frame member 12, to hold the bottom of the shoe against the guiding presser-feet, and similar to the machine of the prior patent mentioned above, the herein illustrated machine has a cable 40, connected at one end to a lever arm 42 that is pivotally mounted on the machine frame 5, which extends over pulleys 44, 46 and 48 to an anchorage on the lower ends of two links 50 which extend downwardly from the jack frame member 12. During the operation of the machine, the lever arm 42 is constantly urged to turn, in a counterclockwise direction, by means of a long coil spring 60 that is stretched from the outer end of this arm to an anchor pin 62 mounted on the machine frame 5. This spring is of just sufficient strength to support the entire weight of the jack, together with that of a shoe supported thereon, and to hold the bottom of the shoe yieldingly, with a relatively light pressure, against the guiding presser-feet 4. Due to the considerable length of this spring, the pressure of the shoe bottom against the guiding presser-feet will be maintained substantially constant, regardless of the different vertical positions assumed by the jack frame member 12, because of the heightwise curvature of the shoe bottom, as the shoe is shifted relatively to the lasting devices.

In order, at times, to increase the upward pressure exerted on the jack frame member 12 by means of the cable 40 and arm 42, and thereby hold the bottom of the shoe more firmly against the guiding presser-feet 4, a second spring 80 is connected at one end to this arm by means of a rod 82 on which is threaded an anchor block 84 that is secured in position on the rod by a lock nut 86, see Fig. 2. The opposite end of the spring 80 is secured, by a similar anchor block 88 and screw 90, to the lower end of a T-shaped ratchet bar 92 that is slidably mounted in a correspondingly shaped groove 94 in a slide 96. At its upper end, this slide is pivotally connected to one arm of a lever 98 that is rotatably mounted on a cross shaft 100 supported on the machine frame 5.

The other arm of this lever 98 is connected by means of a link 102 to the oscillating and vertically moving lever 24. Extending outwardly from one side of the slide 96 is an ear 104, in which a pawl lever 106 is pivotally mounted. This pawl lever has one arm that is provided with a pawl tooth 108 which at times is adapted to engage ratchet teeth 110, formed on the ratchet bar 92, and another arm 112 which is pivotally connected to the lower end of a bracket member 114. This bracket member is mounted for vertical sliding movement on the shaft 100, between a boss 116 on the lever 98 and a collar 118, see Fig. 3, by means of an elongated slot 120, and at its upper end is provided with an outturned flange 122 in which is threaded a stop screw 124 having a knurled head 126 and a lock nut 128. A light coil spring 130 extends between a pin 132, mounted on the bracket 114, and a stud 134 on which the pawl lever 106 is pivoted.

As in the prior machine disclosed in the above-mentioned patent, the herein-illustrated machine is provided with mechanism for swinging the lever arm 42 in a clockwise direction to lower the jack at the conclusion of the lasting operation, and this mechanism comprises a lever arm 140, pivotally mounted on the machine frame 5, alongside of the lever arm 42 and having a set screw 142 adapted, at times, to bear against the upper side of a lug 144 projecting from the lever arm 42. The arm 140 is operated by a pattern cam 146, on the pattern cam shaft 27, through a bell crank lever 148, one arm of which carries a cam roll 150 while the other arm is connected to the arm 140 by means of a link 152. With this arrangement, during the operation of the machine, the cam roll 150 is out of contact with the cam 146 and the arm 42 is free to move under the influence of the springs 60 and 80. However, when the pattern cam shaft 27 completes its revolution, the bell crank lever 148 is actuated to depress the lever arm 140 and with it the lever arm 42, thereby relieving the cable 40 from the tension of the spring 60, the spring 80 being at this time disconnected from slide 96 and wholly relaxed, and permitting the jack frame member 12 to move downwardly. This movement of the lever arm 140 also straightens a toggle, formed by links 160 and 162, see Fig. 1, the former being connected to the arm 140 and the latter to the machine frame 5. This toggle is held in this straightened condition, in which it constitutes a locking means for holding the spring 60 out of operation, by means of a tension spring 164.

Referring to Fig. 1, as in the prior machine of the patent above mentioned, the lasting devices are operated during a portion of the first half revolution of the shaft 10, and while the oscillating lever 24 is moving downwardly, and the movement of the jack to feed the shoe is effected during a portion of the second half revolution of the shaft and while the lever 24 is moving upwardly. As the lever 24 descends, the lever 98 is turned in a counterclockwise direction, thus elevating the slide 96 which is connected thereto from the position in which it is shown in Fig. 1. The spring 130, however, holds the bracket 114 in its lowermost position, as determined by the engagement of the stop screw 124 with the shaft 100, and the pawl lever 106 is turned in a counterclockwise direction until its tooth 108 catches one of the teeth 110 formed on the ratchet bar 92, thus connecting the slide 96 to the spring 80. Thereafter, and as the downward movement of the lever 24 and the counterclockwise turning of the

lever 98 continue, the bracket 114 and slide 96 move upwardly and the spring 80 is tensioned, the parts eventually reaching the positions shown in Fig. 2. As the lever 24 moves upwardly, a reverse action takes place and the lever 98 now turns in a clockwise direction. This permits the spring 130 to pull the bracket 114 downwardly, thus relaxing the tension of the spring 80, until the stop screw 124 again contacts the shaft 100 whereupon the pawl lever 106 will be turned in a clockwise direction to remove its tooth 108 from engagement with the ratchet teeth on the bar 92, thereby disconnecting the spring 80 and entirely relaxing its tension.

The timing of the operation of the mechanism just described is such that the parts will assume the positions shown in Fig. 2, in which the maximum tensioning of the spring 80 is effected, during that point in the operation of the lasting devices when the upper securing devices are acting, and the pawl lever 106 will release the bar 92, thus relaxing the spring 80 entirely, before the jack starts to move to feed the shoe.

As will be apparent, the amount that the spring 80 is tensioned will depend on the time in the cycle which the pawl 106 engages the teeth 110 on the ratchet bar 92. This may be varied by adjusting the position of the bracket 114, when the parts are in the positions shown in Fig. 1 by means of the stop screw 124. For example, if the bracket is elevated, the pawl 106 will engage the ratchet teeth 110 later in the cycle and the spring 80 will be tensioned a lesser amount. On the other hand, if the bracket is lowered, the pawl will engage the ratchet teeth earlier in the cycle and the spring 80 will be tensioned more.

With the novel mechanism described, while the feeding of the shoe is being effected, the jack is moved upwardly to press the bottom of the shoe against the guiding presser-feet 4 with a light pressure by the spring 60, which, as above noted, is of just sufficient strength to support the weight of the jack and a shoe supported thereon, and to provide this upward pressure. However, during the operation of the lasting devices, the spring 80 is tensioned and its force is added to that of the spring 60, with the result that the shoe is held more firmly against the guiding presser-feet at this time. As noted above, the spring 60 is of considerable length so that the pressure of the shoe bottom against the guiding presser-feet 4 will be maintained substantially constant, regardless of the different vertical positions assumed by the jack frame member 12 because of the heightwise curvature of the shoe bottom, as the shoe is shifted relatively to the lasting devices. Also, regardless of the vertical position of the jack frame member 12, the same selected amount of additional upward pressure will be applied to the jack.

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

1. In a machine for use in the manufacture of shoes, the combination with intermittently operating devices for acting on the marginal portion of a shoe to perform an operation progressively along the opposite edges of the shoe and a shoe supporting jack operating in time relation to the action of said devices to transfer the point of operation of the devices along the opposite marginal portions of a shoe supported on the jack, of mechanism for exerting upward pressure on the jack to hold the shoe against said devices comprising means for supporting the entire weight of the jack and a shoe thereon to hold the shoe yieldingly against said devices, and separate means, normally inoperative but arranged to be rendered operative at a variable determined time, for applying an adjustably variable amount of additional upward pressure on the jack to hold the shoe more firmly against the devices during their periods of action.

2. In a machine for use in lasting shoes, the combination with intermittently acting devices for lasting the upper of a shoe progressively along the opposite sides of the shoe, said devices each including upper tensioning means, upper securing means, and a guiding presser-foot for engaging the bottom of the shoe, and a shoe supporting jack operating in time relation to the action of said devices to transfer the point of operation of the devices along the opposite marginal portions of a shoe support on the jack, of mechanism for exerting upward pressure on the jack to hold the shoe against the guiding presser-feet of said devices comprising means for supporting the entire weight of the jack and a shoe thereon to hold the shoe yieldingly against said guiding presser-feet, and separate means, normally inoperative but arranged to be rendered operative at a variable determined time, for applying an adjustably variable amount of additional upward pressure on the jack to hold the shoe more firmly against the guiding presser-feet during the periods of action of said devices.

3. In a machine for use in the manufacture of shoes the combination with intermittently operating devices for acting on the marginal portion of a shoe to perform an operation progressively along the opposite edges of the shoe and a shoe-supporting jack operating in time relation to the action of said devices to transfer the point of operation of the devices along the opposite marginal portions of a shoe supported on the jack, of mechanism for exerting upward pressure on the jack to hold the shoe against said devices comprising a spring for supporting the entire weight of the jack and a shoe thereon to hold the shoe yieldingly against said devices, and separate means, normally inoperative but arranged to be rendered operative at a variable determined time, for applying an adjustably variable amount of additional upward pressure on the jack to hold the shoe more firmly against the devices during their periods of action.

4. In a machine for use in lasting shoes the combination with intermittently acting devices for lasting the upper of a shoe progressively along the opposite sides of the shoe, said devices each including upper-tensioning means, upper-securing means, and a guiding presser-foot for engaging the bottom of the shoe, and a shoe-supporting jack operating in time relation to the action of said devices to transfer the point of operation of the devices along the opposite marginal portions of a shoe supported on the jack, of mechanism for exerting upward pressure on the jack to hold the shoe against the guiding presser-feet of said devices comprising a spring for supporting the entire weight of the jack and a shoe thereon to hold the shoe yieldingly against said guiding presser-feet, and separate means, normally inoperative but arranged to be rendered operative at a variable determined time, for applying an adjustably variable amount of additional upward pressure on the jack to hold the shoe more firmly against the guiding presser-feet during the periods of action of said devices.

5. In a machine for use in the manufacture of shoes the combination with intermittently op-

erating devices for acting on the marginal portion of a shoe to perform an operation progressively along the opposite edges of the shoe and a shoe-supporting jack operating in time relation to the action of said devices to transfer the point of operation of the devices along the opposite marginal portions of a shoe supported on the jack, of mechanism comprising means for counterbalancing the entire weight of the jack and a shoe thereon and operative to hold the bottom of the shoe yieldingly, with a light pressure, against said devices, means including a spring for applying an adjustably variable amount of additional upward pressure on the jack to hold the bottom of the shoe more firmly against said devices, and means for rendering said spring operative only during the periods of action of said devices.

6. In a machine for use in lasting shoes the combination with intermittently acting devices for lasting the upper of a shoe progressively along the opposite sides of the shoe, said devices each including upper-tensioning means, upper-securing means, and a guiding presser-foot for engaging the bottom of the shoe, and a shoe-supporting jack operating in time relation to the action of said devices to transfer the point of operation of the devices along the opposite marginal portions of a shoe supported on the jack, of mechanism comprising means for counterbalancing the entire weight of the jack and a shoe thereon and operative to hold the bottom of the shoe yieldingly, with a light pressure, against the guiding presser-feet of said devices, means including a spring for applying an adjustably variable amount of additional upward pressure on the jack to hold the bottom of the shoe more firmly against said guiding presser-feet, and means for rendering said spring operative only during the periods of action of said devices.

7. In a machine for use in the manufacture of shoes the combination with an intermittently operating device for acting on the marginal portions of a shoe to perform an operation progressively along the edge of the shoe and a shoe-supporting jack operating in time relation to the action of said device to transfer the point of action of the device along the marginal portion of a shoe supported on the jack, of mechanism comprising means for counterbalancing the entire weight of the jack and a shoe thereon and operative to hold the bottom of the shoe yieldingly, with a light pressure, against said device, spring means for applying additional upward pressure to the jack to hold the bottom of the shoe more firmly against said device, means for rendering said spring operative only during the periods of action of said device, and manually operable means for selectively varying the amount of additional pressure applied by said spring.

8. In a machine for use in the manufacture of shoes the combination with intermittently operating devices for acting on the marginal portion of a shoe to perform an operation progressively along the opposite edges of the shoe and a shoe-supporting jack operating in time relation to the action of said devices to transfer the point of

operation of the devices along the marginal portions of a shoe supported on the jack, of mechanism comprising means for counterbalancing the entire weight of the jack and a shoe thereon and operative to hold the shoe yieldingly, with a light pressure, against said devices, spring means for applying additional upward pressure on the jack to hold the bottom of the shoe more firmly against said devices, means for rendering the spring means operative only during the periods of action of said devices, and manually operable means for selectively varying the amount of additional pressure applied by said spring.

9. In a machine for lasting shoes the combination with an intermittently acting device for lasting the upper of a shoe progressively along the side of the shoe, said device including upper-tensioning means, upper-securing means, and a guiding presser-foot for engaging the bottom of the shoe, and a shoe-supporting jack operating in time relation to the operation of said device to transfer the point of operation of the device along the marginal portion of a shoe supported on the jack, of mechanism comprising means for counterbalancing the entire weight of the jack and a shoe thereon and operative to hold the bottom of the shoe yieldingly, with a light pressure, against said guiding presser-foot, spring means for applying additional upward pressure on the jack to hold the bottom of the shoe more firmly against said guiding presser-foot, means for rendering said spring operative only during the periods of action of said device, and manually operable means for selectively varying the amount of additional pressure applied by said spring.

10. In a machine for use in lasting shoes the combination with intermittently acting devices for lasting the upper of a shoe progressively along the opposite sides of the shoe, said devices each including upper-tensioning means, upper-securing means, and a guiding presser-foot for engaging the bottom of the shoe, and a shoe-supporting jack operating in time relation to the action of said devices to transfer the point of operation of the devices along the opposite marginal portions of a shoe supported on the jack, of mechanism comprising means for counterbalancing the entire weight of the jack and a shoe thereon and operative to hold the bottom of the shoe yieldingly, with a light pressure, against said guiding presser-feet, spring means for applying additional upward pressure on the jack to hold the bottom of the shoe more firmly against said guiding presser-feet, means for rendering the spring means operative only during the periods of action of said devices, and manually operable means for selectively varying the amount of additional pressure applied by said spring.

CHARLES A. ROBINSON.
HERMAN A. IMHOF.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,201,866	Lawson	May 21, 1940