

A. BATES.
HEEL BREASTING MACHINE.
APPLICATION FILED OCT. 19, 1907.

1,000,980.

Patented Aug. 22, 1911

6 SHEETS-SHEET 1.

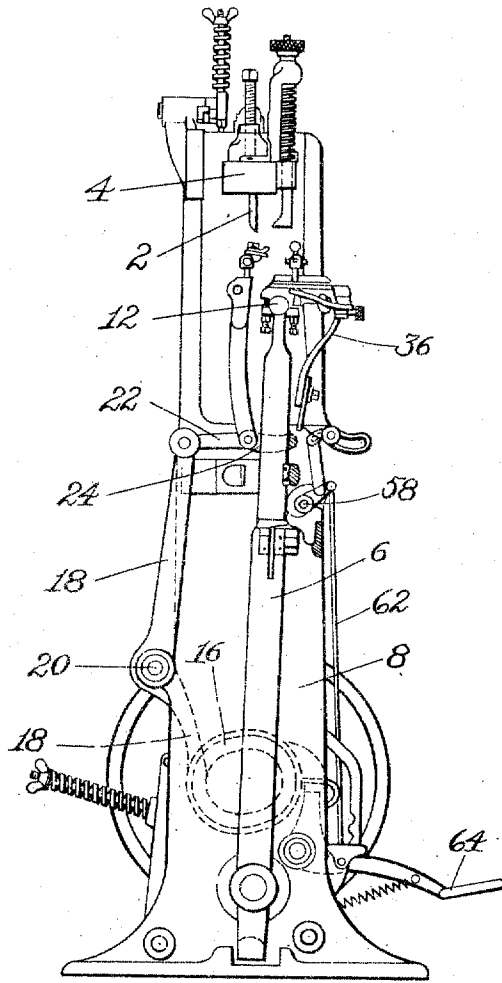


Fig 1.

WITNESSES.

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5 SHEETS—SHEET 2.

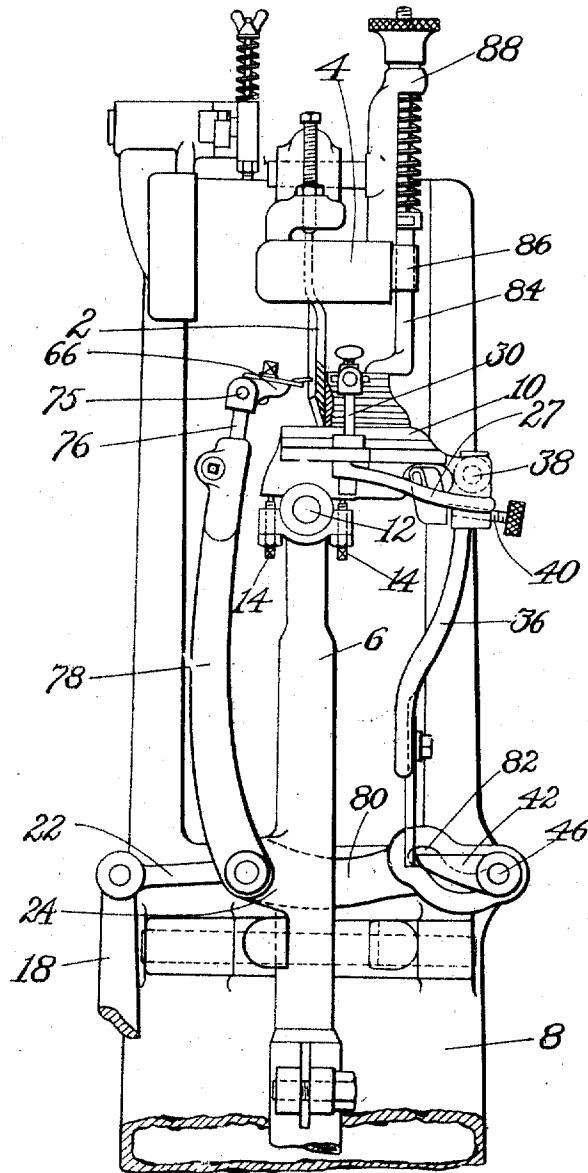


Fig. 2

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5 SHEETS—SHEET 3.

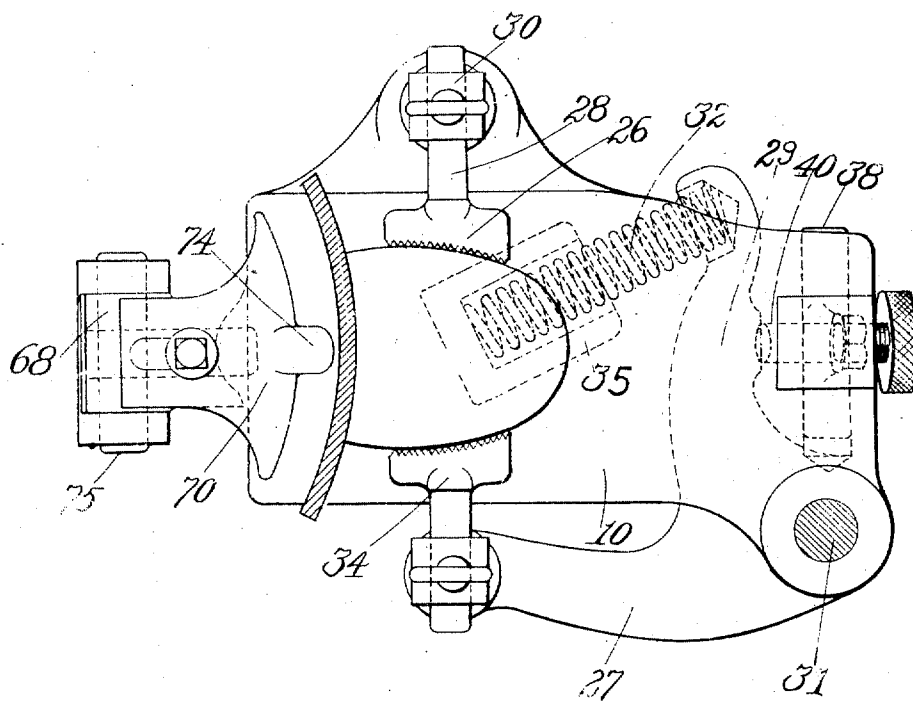


Fig. 3.

WITNESSES.

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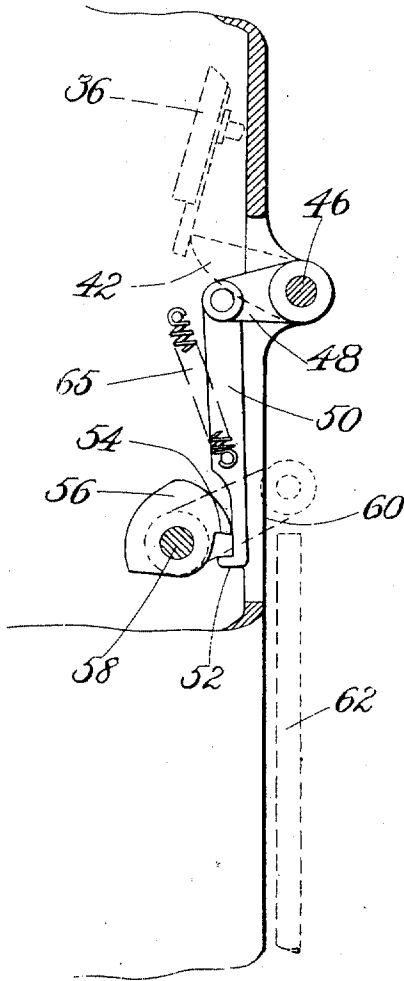


Fig. 4

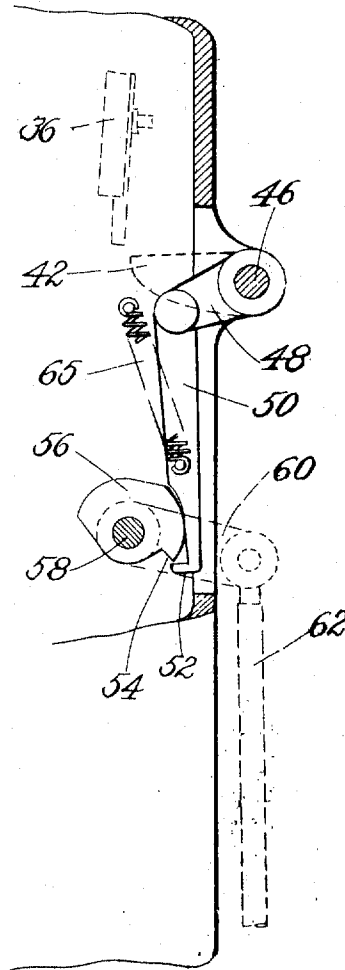


Fig. 5.

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6 SHEETS—SHEET 5.

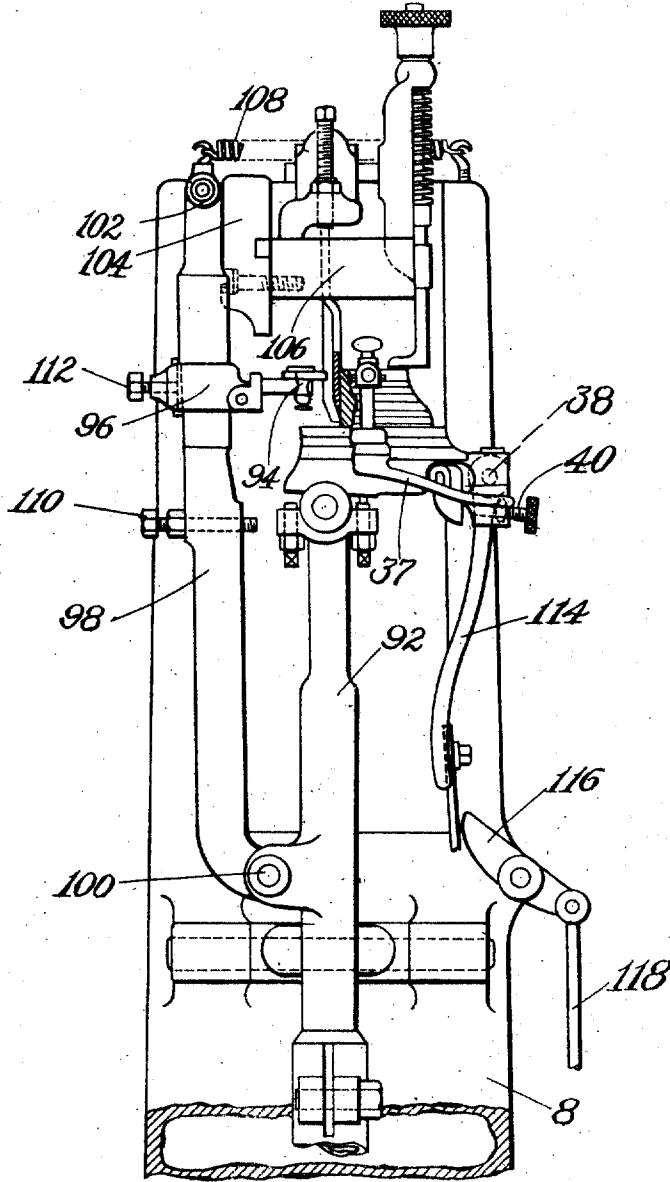


Fig. 6.

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UNITED STATES PATENT OFFICE.

ARTHUR BATES, OF LEICESTER, ENGLAND, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HEEL-BREASTING MACHINE.

1,000,980.

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Application filed October 19, 1907. Serial No. 398,182.

To all whom it may concern:

Be it known that I, ARTHUR BATES, a subject of the King of England, residing at Leicester, in the county of Leicester, Eng-
land, have invented certain Improvements in Heel-Breasting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the draw-
ings indicating like parts in the several figures.

This invention relates to machines for breasting heels used in the manufacture of boots and shoes and has for its objects to improve the construction and arrangement of heel-breasting machines and, more particularly, to provide a machine of this class which shall be capable of breasting heels more rapidly and which may be more easily operated than has been possible with machines previously used for this purpose.

With these and other objects in view, a feature of the present invention consists in the provision in a heel-breasting machine of power-actuated clamping members for holding the heel to be breasted arranged to be controlled by the operator through the medium of starting mechanism for actuating a suitable breasting device. The arrangement is preferably such that power is applied to close the clamping members before the machine can be started in order that the operator may see that the heel is correctly clamped upon its support before the commencement of the breasting operation. It is considered to be within the scope of this invention to employ any suitable power-actuated means for closing the clamping members before starting the machine to actuate the breasting device, as it is believed that the present invention is the first to provide, in a heel-breasting machine, a power-actuated heel clamping device the operation of which is controlled by the operator before the starting of the machine to actuate the breasting knife.

This invention further includes a mechanism for successively causing the operation of the power-actuated clamping members and the starting of the machine, and the construction is such that said mechanism is relieved at the end of an initial movement from the stress of controlling the clamping members, so that the operator disposes of controlling the clamping of the

work before starting the machine and is thus relieved of exerting any such additional force in the second operation as would have had to be maintained but for the relief afforded by this construction.

Another feature of this invention consists in the provision of a breast gage for positioning the heel upon its support, which is arranged to be moved clear of the heel longitudinally of the heel prior to the breasting operation, and preferably this movement is automatically derived from a moving part of the machine, and the arrangement is such that the breast gage is automatically returned to its effective position after the breasting operation and in this last movement acts as a heel ejector to knock the breasted heel from its support into a chute which leads to a suitable receptacle.

The present invention further includes the combination with an angularly adjustable work-supporting table provided with clamping members, of power-actuated mechanism for operating the clamping members constructed and arranged to be controlled by the operator and to effect the clamping of the work in any position that may be given to the supporting table.

In the preferred embodiment of the invention, a heel support is mounted for automatic movement to and from breasting position, in which it lies within the path of the breasting knife. The heel support comprises spaced clamping members and resilient means are provided to move relatively the said members into operative engagement with a heel positioned between them during an initial movement of the starting treadle. The heel is thus clamped in place before the machine is started so that the movement of the heel support into the path of the breasting knife will not displace the said heel upon its support, which displacement would be liable to occur if the heel were not clamped prior to the commencement of the above movement. The construction is such that after the machine has been started by a further movement of the operating treadle, the heel support is moved automatically under the knife which is then automatically actuated to breast the heel, and after this operation has been performed, the heel support is moved from its heel-breasting position back to its heel-re-

ceiving position, and means actuated by this last movement of the heel support are provided to open the clamping members against the resistance of the resilient means and to hold them open until the starting treadle, which in the meantime has been allowed to resume its original position, is again actuated by the operator.

Other features of the invention will be hereinafter described and pointed out in the claims.

In the drawings,—Figure 1 is a side elevation of a preferred embodiment of the present invention; Fig. 2 is an enlarged side elevation of the upper part of the machine shown in Fig. 1; Fig. 3 is a plan view of the heel support; Figs. 4 and 5 are enlarged detail views of a mechanism employed to control the actuation of the clamping members; and Fig. 6 is an enlarged side elevation of an alternative construction of heel-breasting machine.

As shown in Figs. 1 and 2 the breasting knife 2 is mounted upon a rising and falling head 4 and may be automatically actuated from the driving shaft of the machine by any suitable means, as is common in this art. A jack-post 6 is pivoted at its lower end to the main frame 8 of the machine and a heel support comprising a table 10 is pivotally mounted at 12 upon the jack-post and the arrangement is such that the jack-post can be moved to and from a position in which a heel carried by the support lies within the path of the breasting knife. Adjusting screws 14 projecting upwardly on each side of the top of the jack-post are provided to vary the angular position of the heel support.

The mechanism for swinging the jack-post comprises a cam 16 on the main shaft of the machine which actuates a lever 18 pivoted to the frame of the machine at 20 and connected by a link 22 with a boss 24 projecting from the jack-post.

The pivoted table 10 is provided with clamping devices which are arranged to engage the sides of the heel supported upon the said table. One of the clamping members 26 is, as shown in Fig. 3, normally stationary and serves as a positioning device as well as a clamping member and has a rearward extension 28 slidably mounted in the upper end of a stem 30 which is adjustably supported for vertical movement in a socket in the table. Suitable means may be provided to hold the rearward extension 28 and stem 30 in any desired adjustment. The other clamping member 34 is mounted so as to permit adjustment on its support, in a similar manner to clamping member 26, in one arm 27 of a bell-crank lever which is pivoted to the under side of the table at 31 and has its other arm 29 engaged by one end of a compression spring 32 whose oppo-

site end is received in a socket 35 in the under side of the table. A depending arm 36, pivoted to the table at 38, is provided with a boss which carries a milled screw 40 arranged to engage the arm 29 of the bell-crank lever and the lower end of the said depending arm is arranged to engage a detent 42 which is pivoted to the frame of the machine. When the screw 40 is not bearing against the arm 29 of the bell-crank lever the spring 32 will hold the clamping member 34 in engagement with any work positioned between the two clamping members as shown in Fig. 3, but if the depending arm 36 is operated to bring the screw 40 against the arm 29 of the bell-crank lever it will actuate the said lever in opposition to the spring so as to move the clamp 34 away from the stationary clamp 26.

The detent 42 is secured upon a rock-shaft 46, see Figs. 4 and 5, which is provided with an arm 48 upon which is pivoted a depending link 50 having a tooth 52 at its lower end adapted to be engaged by a dog 54 formed upon the periphery of a cam 56 that is mounted upon a shaft 58 journaled in the main frame of the machine and rotatable by an arm 60 secured thereon which is connected by a rod 62 to the starting pedal 64. A spring 65 having its upper end secured to the body of the machine and its lower end to the depending link 50 serves to return the detent to its upper position as will be hereinafter described.

With this construction, when the dog 54 is caused by the movement of the pedal 64 to engage the link 50 the end of the detent 42 will be depressed as in Fig. 5, below the end of the arm 36 against the resistance of the spring 65 and the bell-crank lever will be free to be moved by the action of the spring 32, whereupon the said spring 32 will move the clamping member 34 toward the stationary clamping member 26 to clamp the work in position. Upon the further downward movement of the pedal the dog 54 will pass clear of the tooth 52 and the machine will be started to swing the jack-post under the knife and remove the arm 36 from the path of the detent, and then the spring 65 will restore the detent 42 to its raised position as shown in Fig. 4 whether or not the dog 54 has resumed its original position. Thus, even should the operator not have allowed the pedal to rise, the detent 42 will nevertheless be automatically reset for the purpose of being in position to engage the arm 36 upon its next return movement with the jack-post. When the arm 36 returns with the jack-post it engages the detent 42 and the further movement of the jack-post causes the screw 40 to be forced against the arm 29 of the bell-crank lever to move the clamping member 34 away from the clamp-

ing member 26 against the resistance of the spring 32, and thus the clamping device is left open ready for the reception of another heel.

5 It will be observed that the force for actuating the clamp is applied by the spring 32 when the clamp is closing and by the jack-post forcing the arm 36 against the detent 42 in the opening of the clamp, and therefore the operator does not have to supply the power to actuate the clamp but only the lesser power for controlling its actuation. Moreover, as the dog 54 passes clear of the tooth 52 at the end of an initial movement of the starting pedal, the operator is enabled to dispose of the stress of controlling the clamping of the work before commencing the starting of the machine and is thus relieved of exerting any such additional force in the second operation as would have had to be maintained but for the relief afforded by this construction.

10 A breast gage 66 is employed in addition to the clamping members 26 and 34 to aid in initially positioning and centering a heel upon the table 10 and is arranged to be moved clear of the heel and away from the path of the breasting knife when the jack-post is moved into the position in which it is shown in Fig. 2 to bring the clamped heel under the breasting knife 2. The said breast gage 66 is, as shown in Fig. 3, formed of two sections 68 and 70 which are connected by a bolt passing through an opening in one of the sections and a slot in the other section so that the gage may be adjusted for different sizes of heels. The section 70 is provided at its upper edge with a heel-ejecting projection 74 and the section 68 is mounted for limited pivotal movement at 75 upon a rod 76 which is supported for vertical adjustment in the arm 78 of a bell-crank lever which is pivoted upon the boss 24 on the jack-post and has its other arm 80 provided with a cam slot 82 arranged to slide upon the rock-shaft 46. The slot 82 is so shaped that when the jack-post is moved inwardly from the position in which it is shown in Fig. 1 to the position shown in Fig. 2 the arm 80 of the bell-crank lever will be actuated to move the breast gage 66 away from the jack-post leaving the heel free to be operated upon by the breasting knife 2. The bell-crank lever supporting the breast gage may be so shaped as to be out of the way of the body of a boot or shoe when the machine is being used to breast a heel already attached to a boot or shoe, or the arm 78 may be formed of hinged sections so that the part carrying the breast gage can be turned down out of the way.

An adjustable tread clamp is employed to bear upon the work and to hold it down upon the table during the breasting operation, and comprises a rod 84 slidingly

mounted in bearings 86 and 88 upon the head 4 and a compression spring surrounding the rod, having one end engaging the bearing 88 and the other end a boss upon the said rod. The lower end of the rod 84 is preferably bent as shown in the drawings to provide sufficient surface to engage a heel and hold it firmly upon the supporting table.

15 In the operation of this machine which will be assumed to be in the position in which it is stopped, as shown in Fig. 1, the operator puts the heel to be breasted upon the pivoted table 10, which has been adjusted by the screws 14, so as to enable the knife 2 to make its cut at the desired angle to the tread, and raises the breast gage 66 by swinging it about its pivot 75 and pushes the heel under the heel-ejecting projection 74 against the said gage 66 and the fixed clamping member 26 and then actuates the pedal which depresses the detent 42 and thus permits the spring 32 to close the clamp and hold the heel in place in the manner hereinbefore described. The further movement of the pedal actuates the clutch which starts the machine and the jack-post is then swung by the cam 16 and lever 18 to bring the heel beneath the knife while at the same time the breast gage is moved clear of the heel by the cam slot 82 in the arm 80 of the bell-crank lever. In the further operation of the machine the knife 2 and tread clamp 84 descend and the latter holds the heel upon its support while the former is breasting it. The operation is completed by the knife head 4 being raised and the jack-post moving outwardly from the position in which it is shown in Fig. 2, to the position as shown in Fig. 1, when the detent 42 reengages the arm 36 as shown in Fig. 5 and, as before mentioned, opens the clamping device so as to release the breast heel, and the projection 74 on the breast gage will, on the return of the latter to its effective position, engage and knock the breasted heel off the supporting table 10 so as to allow it to fall by way of a chute or deflector, not illustrated in the drawings, into a suitable receptacle.

20 In the modification illustrated in Fig. 6, the jack-post 92 is stationary and the breast gage 94 is mounted for limited pivotal movement upon a collar 96 which is adjustably supported upon a lever 98 pivoted to the jack-post at 100 and provided at its upper end with a roller 102 which is kept in engagement with the face of a cam 104 carried by the knife head 106 by means of a tension spring 108 which is secured at one end to the said lever 98 and at the other to the main frame of the machine. The cam is so shaped that its downward movement swings the lever 98 away from the jack-post so that the breast gage moves clear of the

breasting knife as the latter descends and conversely, the upward movement of the cam permits the spring to return the lever and the breast gage to their original relation with the heel support.

The lever 98 is provided with a screw abutment 110 which engages the jack-post when the lever swings toward it and by adjusting this screw the initial position of the breast gage can be changed with relation to the heel support to accommodate heels of different lengths.

The collar 96 may be adjusted upon the lever 98 by manipulating the set screw 112 to change the vertical position of the breast gage to suit heels of different heights. This modification is provided with clamping members which are operated by the movement of a depending arm 114 and are similar in construction to the clamping members previously described. The depending arm 114 is controlled by means of a cam 116 pivoted to the main frame of the machine and connected with the starting treadle by means of a link 118 and the arrangement may be such that an initial movement of the starting treadle permits the compression spring to close the clamping members in engagement with a heel positioned between them and the further operation of the treadle starts the machine to actuate a knife which breasts the heel. The operation is completed by allowing the treadle to return to its raised position and this last movement actuates the cam so as to move the depending arm to open the clamping members against the resistance of the compression spring ready for the insertion of another heel.

While I have herein shown my invention as applied to a type of heel-breasting machine in which the heels are breastéd before being attached to the boots or shoes, it should be understood that my invention is not limited to use on a machine of this construction, but is applicable to other types of machines. Moreover, as above pointed out, it would be within the scope of the present invention to employ some of the features above described without others.

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

1. A heel-breasting machine, having in combination, means for automatically trimming the breast of a heel, a stationary member and a movable member for engaging opposite sides of the heel, and means arranged to actuate automatically the movable member to clamp the heel in breasting position prior to the actuation of said trimming means.

2. A heel-breasting machine, having in combination, means for breasting a heel, means for supporting a heel in working

position, a gage for positioning the breast of the heel and automatic means for positively moving said gage clear of the heel in a direction longitudinal thereof prior to the breasting operation and effecting its return to engage the heel by impact after the breasting operation.

3. A machine of the class described, having in combination, means for breasting a heel, means for supporting a heel in working position, a breast gage arranged to be automatically moved clear of the heel prior to the breasting operation and to be returned to its effective position after the completion of the said operation, and means actuated by the return movement of the breast gage for ejecting the breastéd heel from its support.

4. In a heel-breasting machine, a breasting knife, a support having provision for sustaining a heel arranged for movement into and out of the range of the knife, a gage carried by said support for positioning the breast of the heel and means for moving the gage clear of the heel in a direction longitudinal thereof, as said support is moved into the range of said knife.

5. A heel-breasting machine, having in combination, a breasting knife, a heel support for sustaining a heel in the path of the knife arranged for adjustment to permit heels to be sustained with their tread surfaces in different angular relations to the breasting knife and provided with members arranged to engage opposite sides of the heel to clamp the heel in working position, and automatic mechanism for actuating one of said members to clamp and unclamp the heel constructed and arranged to be effective in the different adjustments of said support.

6. A heel-breasting machine, having in combination, means for automatically trimming the breast of a heel, operating mechanism for controlling the said trimming means, a heel-clamping device comprising spaced clamping members, and means independently controlled by the said operating mechanism for automatically causing the said clamping members to grip a heel positioned between them prior to the operation of the said trimming means.

7. A heel-breasting machine, having in combination, means for automatically breasting a heel, operating mechanism for controlling the said breasting means, a heel support provided with members for clamping a heel in working position arranged to be automatically moved to and from breasting position, means controlled by the said operating mechanism for closing the clamping members and means automatically actuated by the movement of the heel support from breasting position for opening the said clamping members.

8. A heel-breasting machine having, in combination, means for automatically trimming the breast of a heel, operating mechanism for controlling the said trimming means, a clamping device comprising spaced clamping members for supporting a heel in working position, resilient means for causing the said members to grip a heel positioned between them, detaining mechanism arranged to prevent the said resilient means from acting, and means actuated by the movement of the said operating mechanism for releasing the said detaining mechanism.

9. In a heel-breasting machine, means for automatically breasting a heel, a heel support provided with spaced clamping members arranged to be automatically moved to and from breasting position, means arranged to normally hold the clamping members in engagement with a heel positioned between them whereby lateral displacement of the heel is prevented during the breasting operation and means automatically actuated by the movement of the heel support from its breasting position for opening the clamping members.

10. A machine of the class described, having in combination, an operating tool arranged to be automatically actuated from a power-driven member, clamping members for clamping a heel in working position, means for storing up energy derived from said power driven member and means under the control of the operator whereby said energy may be released to cause the heel to be clamped between said clamping members prior to the strating of the machine.

11. A heel breasting machine, having in combination, a power driven member, a breasting knife arranged to be actuated therefrom, clamping members for clamping a heel in working position, a device under the control of the operator for effecting

clamping of the heel between said clamping members and mechanism for transmitting force from the power driven member to said device.

12. A heel breasting machine, having in combination, a breasting knife, a heel support, means for sustaining said support comprising a jack post pivotally mounted to permit the heel to be moved into and out of the range of the knife, and automatic means for clamping the heel upon its support prior to the movement of the heel into the range of the breasting knife.

13. A heel breasting machine, having in combination, a breasting knife, a support for sustaining a heel in the path of the knife, a breast gage mounted for swinging movement in a plane transverse to the tread face of the heel having a projection arranged to rest upon the tread surface of the heel whereby the breast gage may be positioned to engage heels of different heights at the intersection of their breast and tread surfaces and means for moving the breast gage clear of the heel prior to the breasting operation.

14. A heel breasting machine, having in combination, a power driven member, a breasting knife arranged to be automatically actuated therefrom, power actuated clamping means for clamping a heel in working position, a device under the control of the operator for actuating said clamping means and means under the control of the operator for successively rendering operative said device and the power driven member.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

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Witnesses:

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