Oct. 16, 1928. 1,687,576

L. S. MACDONALD

METHOD OF AND MEANS FOR TRIMMING UNATTACHED HEELS

Filed Nov. 20. 1922 3 Sheets-Sheet 1

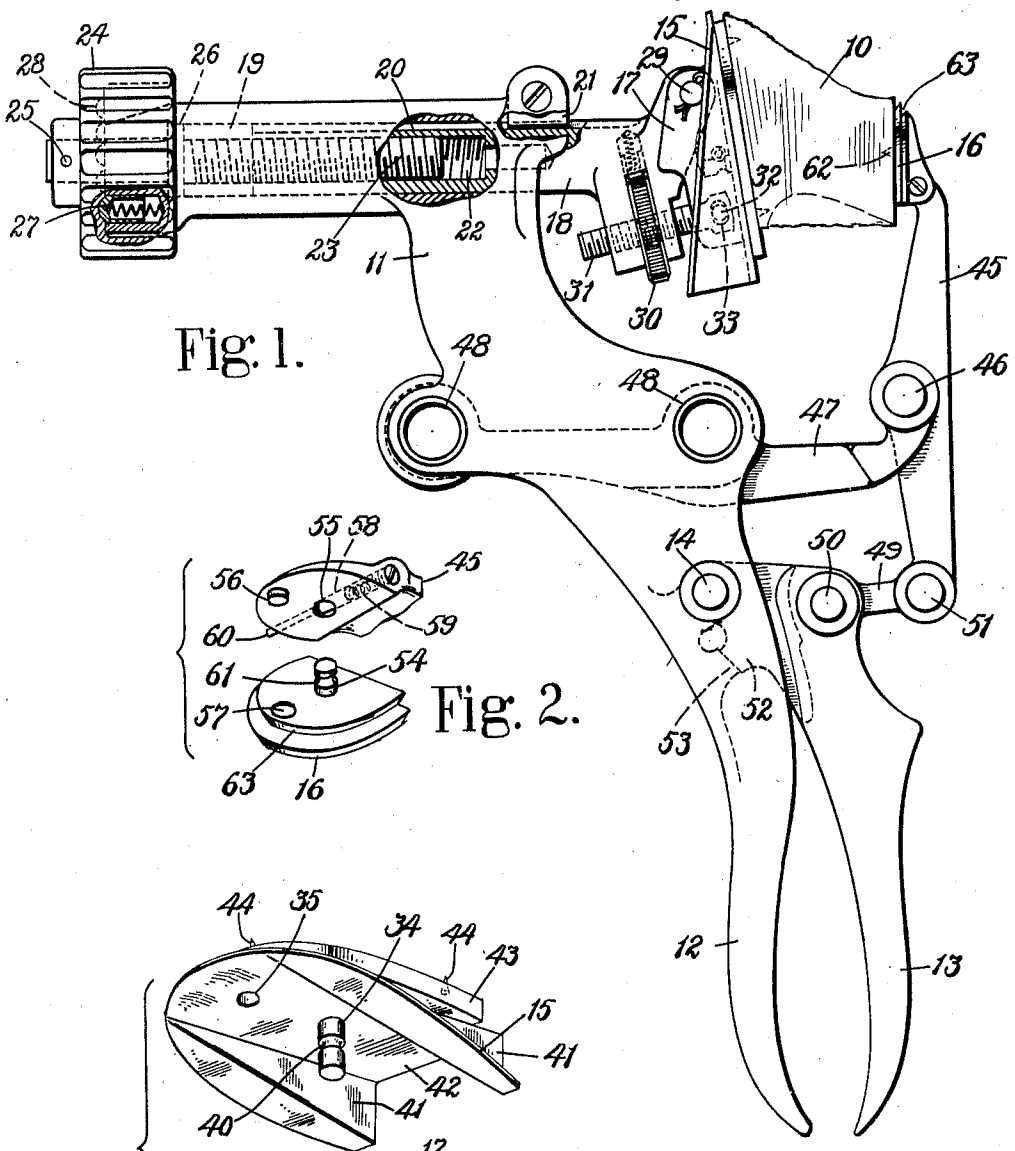


Fig. 1.

Fig. 2.

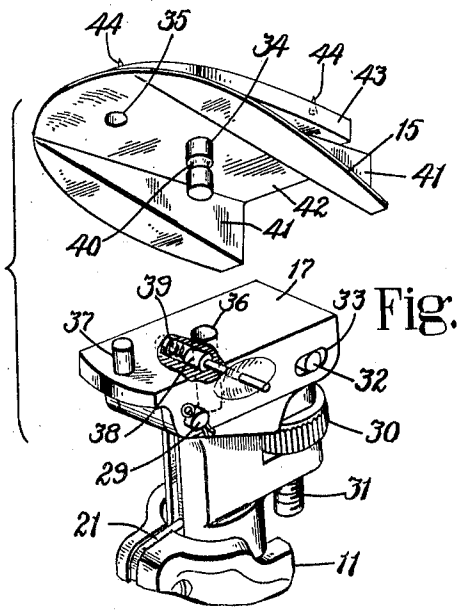


Fig. 3.

INVENTOR.
Lester S. Macdonald
By his Attorney,
Nelson M. Howard

Oct. 16, 1928. 1,687,576

L. S. MACDONALD

METHOD OF AND MEANS FOR TRIMMING UNATTACHED HEELS

Filed Nov. 20, 1922 3 Sheets-Sheet 2

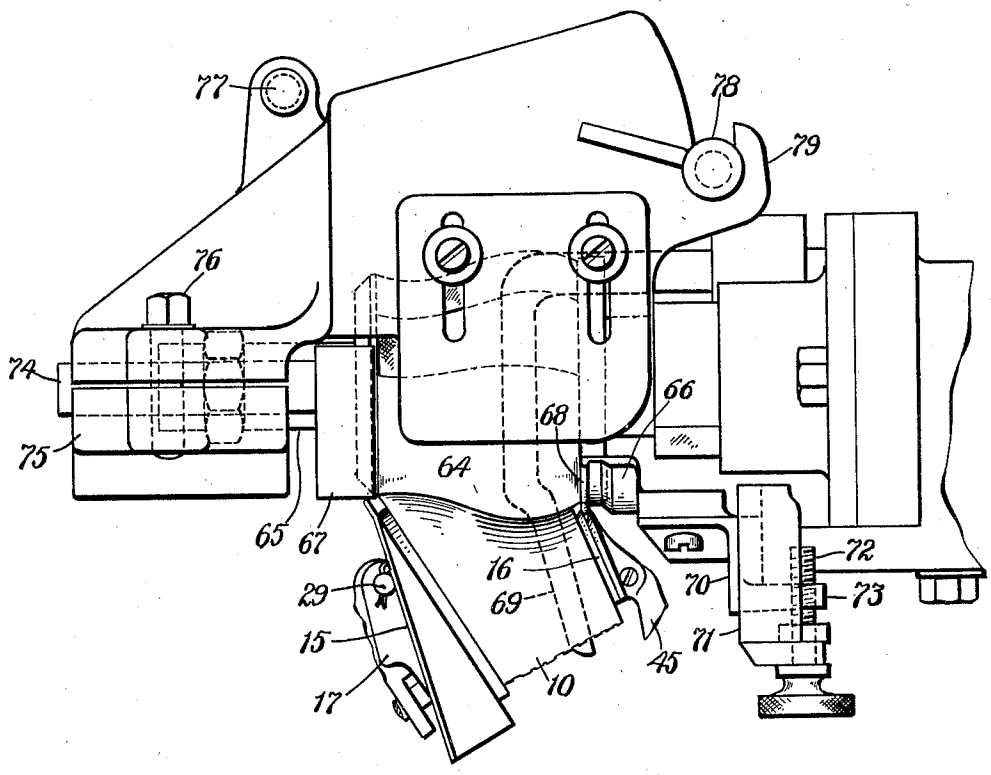


Fig. 4.

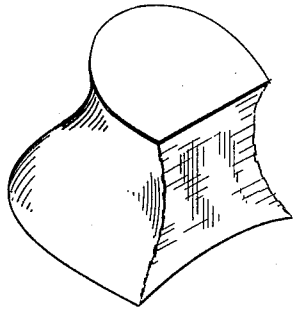


Fig. 6.

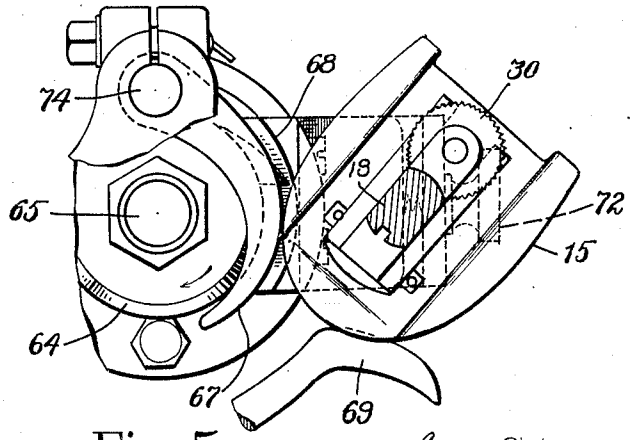


Fig. 5.

Lester S. Macdonald
By Mrs. D. Clowney
Nelson M. Howard

Oct. 16, 1928. 1,687,576

L. S. MACDONALD

METHOD OF AND MEANS FOR TRIMMING UNATTACHED HEELS

Filed Nov. 20, 1922 3 Sheets-Sheet 3

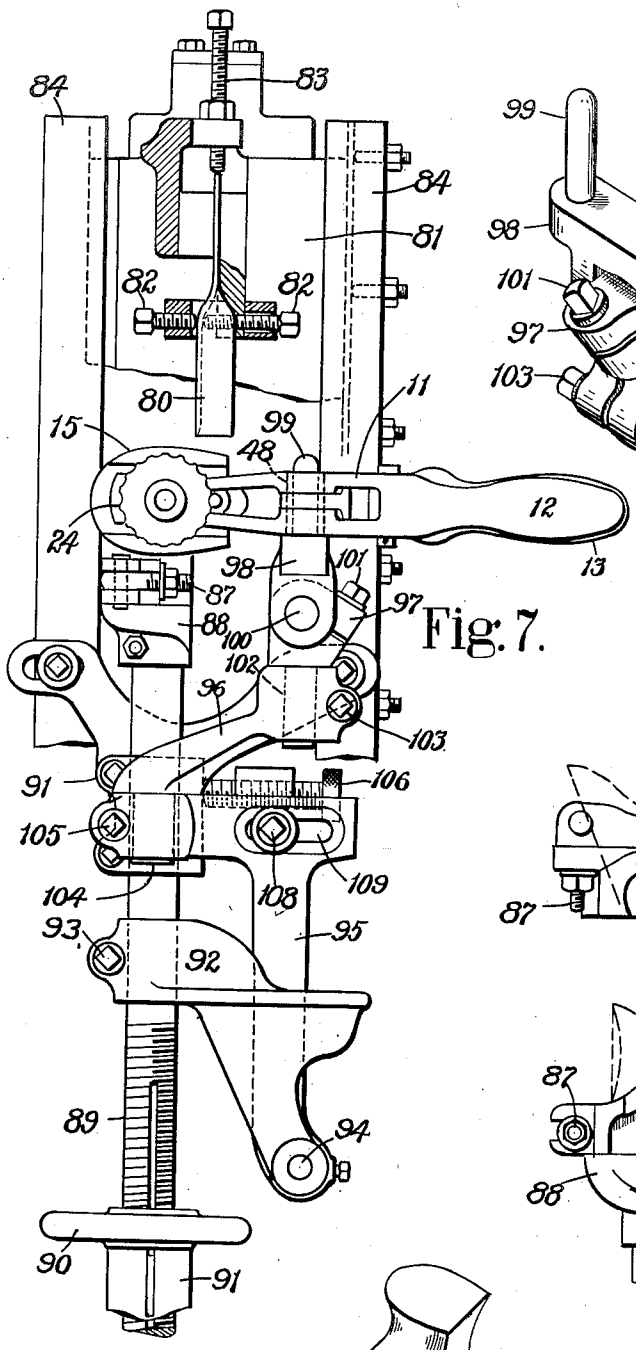


Fig. 7.

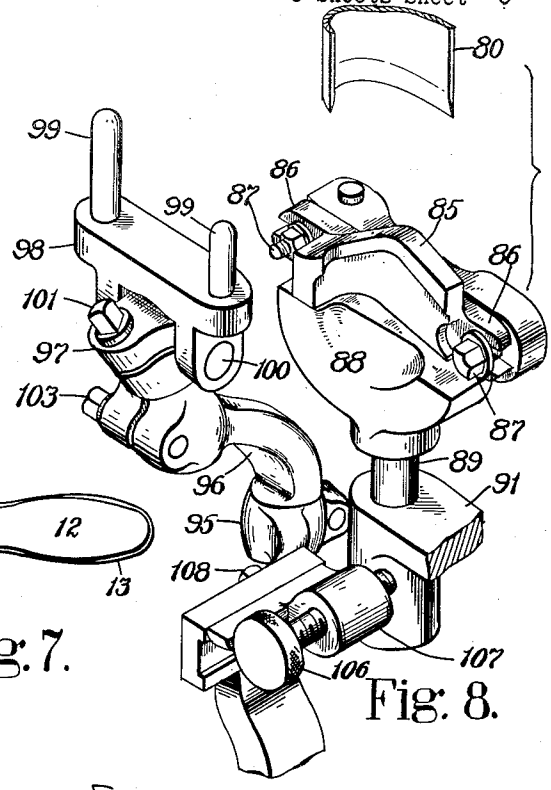


Fig. 8.

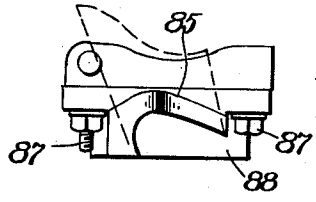


Fig. 9.

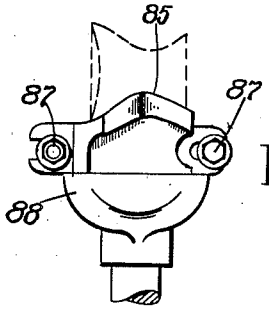


Fig. 10.

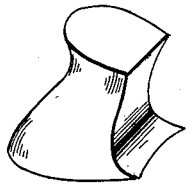


Fig. 11.

INVENTOR.

Lester S. Macdonald

By his Attorney

Nelson W. Howard

Patented Oct. 16, 1928. 1,687,576

UNITED STATES PATENT OFFICE.

LESTER S. MACDONALD, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

METHOD OF AND MEANS FOR TRIMMING UNATTACHED HEELS.

Application filed November 20, 1922. Serial No. 602,120.

This invention relates to the art of shaping heels and comprises both a novel method and novel means by which heels may be shaped before they are attached to shoes. The shaping of heels usually includes two major operations, viz, shaping the periphery and shaping the breast, both of which are included within the scope of this invention.

The more common practice at present is to perform the aforesaid operations after the heels have been attached to the shoes. One reason for this is that the shoes afford convenient means by which the heels may be presented to the trimming instrumentalities and manipulated while being shaped. Under certain conditions, however, it is preferable to shape the heels before they are attached, but this entails problems with respect to manipulation and with respect to controlling the shape of the heels.

As an example of conditions under which it is preferable to shape a heel before attaching it to a shoe, shoe repairing practices are to be considered. Comparatively few, if any, shoe repair shops are equipped with machines designed especially for shaping heels. This is due partly, if not entirely, to the fact that the volume of work done in a repair shop would not warrant such equipment, since it does not often happen that two or more pairs of heels of the same style would require shaping at the same time. It may therefore be stated as a general proposition that shaping heels by machinery is economical only when a comparatively large number of heels of one style are to be shaped consecutively. Under these conditions shoe repair shops have been forced to depend upon hand-shaping and sole-edge-trimming machines to do what heel-shaping falls to their lot, but it would be much more economical and expedient if they could obtain unattached heels fully shaped and requiring nothing more than scouring, dressing and polishing to finish them for use.

In accordance with one object of the invention, the method and machinery included in the scope of the present invention are well adapted to solve the foregoing problems pertaining to the shoe repair trade and also to supplement present practices pertaining to the manufacture of new shoes, in that by practicing such method a heel manufacturer may produce completely shaped heels of all styles uniformly, economically and of first-class quality to supply the requirements of shoe repair shops and shoe factories.

To obtain the results above pointed out the invention provides an improved method of shaping unattached heels by trimming the periphery to a predetermined profile while controlling the course of such trimming to a predetermined standard; and trimming the breast of the heel to a predetermined profile and controlling the course of breast trimming, not only to a predetermined standard, but in a predetermined relation to the peripheral trimming. It would be within the scope of the invention to perform the peripheral trimming and the breast trimming in the reverse order, and although, to avoid confusion and preserve uniformity of expression, the appended claims recite the peripheral trimming and the breast trimming in the order first recited, they are to be construed as including the reverse order of steps.

The foregoing statement of this improved method does not mean that the method is restricted to a single profile or a single course of trimming for the periphery or for the breast, but means that whatever standards may be selected to develop the desired size and style of heel, the object of the improved method is to proceed with the trimming according to those predetermined standards, to the end that any desired size and style may be duplicated with exactness as many times as desired.

According to the illustrative exemplification of this method the heel is secured in fixed relation to form-determining means by which it may be presented to peripheral trimming means and breast-trimming means successively and in predetermined relation to each of them, one form-determining means being utilized to control the course of peripheral trimming according to a predetermined standard and another form-determining means being utilized to control the course of breast trimming according to a predetermined standard, and the two form-determining means being in fixed relation to each other and to the heel to insure that the course of peripheral trimming

and the course of breast trimming will have exactly a predetermined relation to each other.

The invention also includes improved apparatus by which the above-described method may be practiced, said apparatus comprising means for presenting the heel to the peripheral trimming means and to the breast-trimming means successively and including means constructed and arranged to control the course of peripheral trimming according to a predetermined standard as well as means for controlling the course of breast trimming according to a predetermined standard.

It is to be understood that the practice of the aforesaid method is not limited to the utilization of the illustrated apparatus, and that the apparatus aspect of the invention is not limited to the illustrated details of construction.

Other features of the invention are hereinafter described and claimed and are illustrated by the accompanying drawings.

Referring to the drawings,

Fig. 1 is a side elevation of a portable heel-clamp embodying a preferred construction, an untrimmed heel blank being clamped thereby;

Fig. 2 is a perspective view including a portion of one of the clamping jaws and a detachable templet for engaging the toplift;

Fig. 3 is a perspective view of a portion of the other one of the clamping jaws and a detachable templet for engaging the seat face of the heel blank;

Fig. 4 is a top plan view of a portion of a machine for shaping the periphery of the heel, and includes fragments of the aforesaid clamping jaws holding a heel in position to be shaped;

Fig. 5 is an elevation, partly in section, of the assemblage shown by Fig. 4, as viewed from left to right;

Fig. 6 is a perspective view of a heel blank after its periphery has been shaped by the means included in Figs. 4 and 5, its breast being still unshaped;

Fig. 7 is an elevation, partly in section, of a breasting machine comprising novel features of construction and including the heel-clamp shown by Fig. 1;

Fig. 8 is a perspective view of portions of the breasting machine;

Fig. 9 is a top plan view of a cutting-block included in Fig. 8, the profile of a heel being represented by broken lines;

Fig. 10 is an elevation of the cutting-block included in Fig. 9 and also includes broken lines to represent a heel resting thereon; and

Fig. 11 is a perspective view of a heel the periphery and breast of which have been shaped according to the purposes of this invention.

A rough heel blank 10 to be shaped is first placed in a portable heel clamp or carrier such as that shown by Fig. 1, and is maintained in one relation to said carrier throughout the operations by which its periphery and breast are shaped. This carrier comprises a frame 11 having a rigid handle portion 12. This handle portion constitutes one half of a grip, the other half of which is afforded by a relatively movable handle member 13 connected to the frame by a pivot 14. The heel blank is clamped by jaws one of which comprises a templet 15 and the other of which comprises the templet 16. These templets engage the seat face and first lift respectively of the heel blank. The templet 15 is carried by a head 17 which, in turn, is carried by a shank 18. The latter is preferably cylindric to fit in a cylindric bore 19 in the frame 11. To prevent the shank from turning about its axis it is provided with a longitudinal groove 20 to receive a feather 21 affixed to the frame. To provide for longitudinal adjustment of the shank relatively to the frame the shank is bored and tapped to provide a screw-thread 22 and is occupied by an adjusting screw 23. A hand-wheel 24 may be affixed to the outer end of the screw by any convenient means such as a pin 25. A flange 26 formed on the screw is seated against a shoulder in the bore 19 while the interior of the hand-wheel is seated against an extremity of the frame 11, thus preventing end-play of the adjusting screw but permitting rotation thereof. A spring-stressed follower 27 is arranged in a socket formed in the frame 11 to hold the adjusting screw in various positions of adjustment, the hand-wheel having a circular series of depressions 28 in any one of which the follower may be seated. This construction provides for adjusting one of the clamping jaws in a right line according to the height of the heel.

The head 17 is connected to the shank 18 by a pivot 29 so that the templet 15 may have angular adjustment according to the degree of wedge of the heel blank. Angular adjustment is effected by a thumb nut 30 and screw 31, one end of the screw being connected to the head 17 by a pin 32, and the head having slots 33 to compensate for angular movement so as to prevent the parts from binding.

The head 17 and templet 15 are preferably provided with cooperative connecting devices by which the templet may be quickly attached and detached, so that templets of various styles may be interchanged according to the requirements of the work to be trimmed. As shown best by Fig. 3 the templet carries a dowel pin 34 and is provided with a dowel hole 35, while the head 17 is provided with a dowel hole 36 to receive the pin 34 and is also provided with a dowel 37 that may occupy the dowel hole 35. As a convenient means for locking the templet to the head the latter is provided with a socket intersecting the dowel hole 36, and a locking pin 38 is arranged to

slide in this socket. A compression spring 39 normally holds the pin in locking position where it may occupy a groove 40 formed in the dowel 34. The locking pin has a stem that projects so that it may be pushed in by a thumb or finger to displace the locking portion of the pin from the dowel hole 36.

The templet 15 may be made of sheet metal, which construction is particularly advantageous for wedge heels since the sheet metal may be pressed to provide wedge portions 41, 41 approximating in degree the wedge factor of the heel and serving as counterparts of the latter to permit the effective portion of the templet to lie substantially parallel to the tread of the heel. With such formation the wedge portions 41 are connected by a body portion 42 of sufficient area to hold a convex plate 43 designed to conform to the concavity of the seat face of the heel. When the templet proper is made of sheet metal the plate 43 would preferably be made of thicker metal and may be permanently connected thereto in any desired way such as by welding or by rivets. The plate 43 is preferably provided with spurs 44 to indent the heel sufficiently to prevent the latter from slipping. According to the design shown there are three such spurs, one at the back and one at each breast corner.

The other clamping jaw includes, in addition to the templet 16, a carrier for executing suitable clamping movement. As shown, the carrier for this purpose is in the form of a lever 45 and has a pin 46 for its fulcrum. The anchorage for the pin 46 is formed by the forked end of an arm 47, said arm being preferably made of steel for the sake of strength, whereas the frame 11 is preferably made of aluminum for the sake of lightness. The supporting arm 47 is rigidly connected to the frame 11 by two anchoring members 48 which, for reasons hereinafter explained, are preferably tubular.

The preferred form of operating mechanism for developing clamping action of the templets includes toggle links, since such mechanism affords a maximum of clamping stress with a minimum of applied force, is susceptible of quick action in opposite directions, and is self-retaining in clamping position provided it is designed to cross the dead-center position. In adapting toggle mechanism for this purpose the handle member 13 may be utilized as one of the toggle members. The toggle is completed by a link 49 one end of which is pivotally connected to the handle member 13 by a pin 50 while the other end is connected to the lever 45 by a pin 51. The arrangement is such that when the handle member 13 is separated from the member 12 it opens the clamping jaws, but does not move so far as to prevent grasping both handle members simultaneously with one hand. When the grip of the hand is tightened the member 13 moves toward the member 12 until it is arrested by cooperative abutments 52, 53 which are so arranged that the center pivot 50 of the toggle crosses dead-center but does not move so far beyond the latter as to produce any appreciable relaxation of the clamping action on the heel. The handle members 12 and 13 serve also as components of a single handle by which to manipulate the heel while its periphery is being shaped as hereinafter described, and also serve as convenient means by which to carry the assemblage to a breasting machine as also hereinafter described. In fact, these handles serve continuously as the principal means by which the device may be held from the moment when they are closed to clamp an untrimmed heel blank until they are opened after the periphery and breast of the heel have been shaped.

The templet 16, like the templet 15, is preferably detachable from its carrier 45 to be interchangeable with other templets according to the size and style of heels to be trimmed. The templet is therefore provided with a dowel 54 which enters a dowel hole 55 in the carrier, the latter having a dowel 56 that enters a hole 57 in the templet. A socket is formed in the carrier to intersect the hole 55 and is occupied by a locking pin 58 which is normally held in locking position by a compression spring 59. The locking pin has a stem 60 that projects so that the locking portion may be moved back from the hole 55. When the parts are assembled the locking portion of the pin 58 occupies a groove 61 formed in the pin 54. Each templet 16 is preferably provided with a spur 62 to indent the heel so that it will not slip. The periphery of the templet is preferably rabbeted to provide a shoulder 63, said shoulder constituting the guiding element by which the templet serves as such during the operation of trimming the periphery of the heel. This shoulder is preferably undercut for a purpose hereinafter explained.

The heel-clamp or carrier is so designed that it may be manipulated in substantially the same manner as a shoe for the purpose of trimming the periphery of the heel, the handle portions 12 and 13 being substantially in line with the heel and occupying a relation thereto substantially like that of the forepart of a shoe relatively to the heel. The handwheel 24 is useful not only to adjust one of the clamping jaws according to the thickness of the heel but also as a supplemental handle to steady the carrier while the periphery of the heel is undergoing trimming.

A heel blank having been clamped in the carrier as shown by Fig. 1 the assemblage is ready to be presented to a machine for trimming the periphery. Figs. 4 and 5 illustrate portions of a well-known type of commercial trimming machine equipped with guards of novel construction designed to cooperate with the templets to control a course of trimming.

This trimming machine comprises, as usual, a cutter-head 64 carried by a rotary shaft 65 and intended to be driven at high speed in the direction indicated by an arrow in Fig. 5. The cutters are shaped to impart a desired profile to the heel, which profile is shown by Figs. 4 and 6.

The trimming guards, indicated at 66 and 67, are arranged so that the cutter-head is between them. The guard 66 is provided with a rib 68 adapted to afford a bearing for the templet 16 and of a thickness such that it will protrude into the groove or angle formed by the base and undercut controlling shoulder 63 of the templet. The guard 67, however, preferably has a plain substantially cylindric surface on which the templet 15 may bear, thus permitting the point of contact to shift toward and from the guard 66 without physical resistance. The trimming machine is also provided with a stationary heel-rest 69. These elements are sufficient to insure a predetermined course of trimming, provided the portable assemblage is maintained in contact with all three of them while it is being manipulated. In practice the operative will place the heel on the heel rest 69 so that the templets 15 and 16 will engage the guards as shown, and will maintain the heel on the rest and also maintain the templets against the guards while manipulating the heel-carrier to rock the heel while the cutter trims. The depth of trimming is positively limited by the two guard-and-templet couples so that excessive trimming is impossible. As the angle of the heel carrier changes in consequence of rocking it the rib 68 will prevent the heel-carrier from being shifted laterally, provided a slight pressure is maintained against the rib. Therefore, if the templet 15 is not strictly parallel to the templet 16 its point of contact with the guard 67 will shift laterally without any noticeable effect in the action of the heel-carrier and also without any variation from the course of trimming determined by the templets. The results of trimming a plurality of heels can not be otherwise than uniform if the templets are maintained in contact with their respective guards.

The controlling surface of the guard 66 is substantially concentric to the axis about which the cutter rotates. This guard has a dovetail portion 70 arranged to slide toward and from the axis of the cutter in a guiding fixture 71. A thumb screw 72 has swivel connection with the fixture to maintain it against longitudinal movement and works in an ear 73 on the guard that is bored and tapped to provide an internal screw-thread. The guard 66 may thus be adjusted radially in relation to the cutter-head as may be required by various diameters, since cutters of various styles will be interchanged from time to time according to the character of the work in hand. This adjusting means may also be used to compensate for slight variations due to sharpening the cutters.

The guard 67 is provided with a cylindric shank or stem 74 which is held by a split clamping fixture 75 so that it may be adjusted rotatively about the axis of the shank and also adjusted lengthwise of said axis. The clamping portions of the fixture 75 are tightened by a bolt 76. This fixture may be mounted on the frame of the machine in any preferred manner but as shown it is connected to the frame by a pivot stud 77 to permit it to swing. A clamping bolt 78 is screwed into the frame of the machine and cooperates with a notched ear 79 of the member 75 to secure the latter in operative position and to permit said member to swing about the pivot 77 when the bolt 78 is loosened. This construction permits swinging the guard 67 away from the cutter-head whenever it is necessary to remove or replace the latter or to have access to the cutters for purposes of adjustment or for any other purpose, and since the adjustment of the guard relatively to the member 75 is not disturbed by such swinging the guard will always move back to a predetermined position when the notched ear 79 is arrested by the shank of the bolt 78.

If the periphery of the heel is the first part to be shaped the next step in the method is to transfer the portable assemblage to a breast-trimming organization, still maintaining the heel blank in fixed relation to the clamp or carrier. The breasting machine shown by Fig. 7 comprises a breasting knife 80 and means for locating the trimmed heel in a predetermined position such that the trimming cut made by the breasting knife will bear a predetermined standardized relation to the trimmed surface generated by the cutter-head 64. The breasting machine shown by this figure operates by imparting a downward stroke to the breasting knife, and the cutting edge is therefore at the lower end of the knife as shown by Fig. 8. The complete breasting equipment will include knives of various forms to suit the requirements of various styles of heels, that shown having the profile of one style of Louis heel.

The breasting knife is carried by a vertically movable head 81 and is clamped therein by bolts 82, 82. A bolt 83 is arranged to abut against the upper end of the knife member to sustain the cutting stress. The head 81 is arranged to slide in guides 84. The mechanism for operating the head 81, although not herein shown, includes a one-revolution driving clutch that causes one downward stroke and one upward stroke of the head 81 and then automatically disconnects the train of mechanism so that the head will remain in its upper position until the clutch is again tripped.

The breasting knife embodies the curvature or whatever shape characterizes the style of the breast to be trimmed and executes its trim-

ming stroke crosswise of the heel, that is, from one side to the other rather than from the tread toward the base. The breasting organization may also comprise a heel-rest or cutting-block 85 the upper surface of which is shaped to conform to the profile to which the periphery of the heel has been trimmed by the cutter-head 64. In other words, the profile of the block 85 coincides with that of the cutter-head used for trimming the periphery. The breasting equipment will therefore preferably include a variety of cutting blocks 85 to match the variety of cutters used for trimming the periphery, and will be readily interchangeable.

The use of a conformed heel-rest or cutting-block 85 determines the order in which the trimming operations are to be performed. For example, to utilize such conformation the periphery must be trimmed first, for otherwise the profile of the heel blank would not conform to the heel-rest. On the other hand, if a non-conforming heel-rest were used it would be feasible to trim the breast first and the periphery afterward, although this might entail a slight vertical adjustment of the heel-rest for certain individual heels. In either case, however, the trimmed surface generated by the second trimming operation would bear a predetermined standardized relation to that generated by the first, and thus insure uniformity of shape.

Each cutting-block 85 is provided with notched ears 86 to receive bolts 87 by which it is clamped to the head 88 of the jack. This jack has a screw-threaded stem or shaft 89 with which an adjusting nut 90 cooperates to set the cutting-block at the required level. The shaft on the jack is arranged to slide in fixed bearings 91. The bolts 82 by which the breasting knife is clamped afford means for adjusting the knife laterally so that it will cut closely to the cutting-block 85 without touching the latter, the relation being such that the cutting edge descends below but clears the work-engaging surface of the block somewhat after the fashion of a shearing cutter.

Another novel feature of the breasting machine consists in a movable support constructed and arranged to hold the portable heel-carrier and to present the clamped heel in a predetermined registered relation to the breasting knife so that the trimmed breast will bear a definite standardized relation to the trimmed periphery of the heel. The movable support is preferably attached to the shaft 89 of the jack to partake of vertical adjustments imparted to the pack and to maintain a constant relation to the jack notwithstanding such adjustments. For this purpose a bracket 92 is bored to receive the shaft 89 and is split to provide cooperative clamping portions adapted to be clamped to the shaft by a bolt 93. This bracket affords an anchorage for the movable support the latter being preferably connected to the bracket by a pivot 94 so that it may swing as hereinafter described. The support comprises a plurality of relatively adjustable sections 95, 96, 97 and 98 which, when tightened relatively to each other, constitute a unit. The section 98 is provided with dowels 99 formed and arranged to fit in the tubular elements 48, 48 of the portable carrier. The sections 98, 97 are connected by a horizontal pivot 100 which is rigid relatively to the section 98 but angularly adjustable relatively to the section 97. The latter is in the form of a split clamp and may be tightened by a clamping bolt 101. The section 97 is provided with a vertical shank or stem 102 of cylindric form. This stem occupies a socket in the section 96 which is also formed as a split clamp and provided with a clamping bolt 103. The section 96 is provided with a cylindric shank or stem 104 which occupies a socket in the section 95, the latter being formed as a split clamp and having a clamping bolt 105. These connections provide for lateral and bodily adjustment of the section 98 and also provide for angular adjustment about two vertical axes and adjustment about one horizontal axis. It is thus possible to set the dowel section 98 in whatever position may be required to seat the heel on the cutting block 85 so that the stress incidental to trimming the breast will not twist the heel.

Fig. 7 shows the portable carrier mounted on the support and also shows the latter in operative position. The support swings from right to left to carry the heel to the cutting block, and its motion in this direction is arrested by an adjustable stop-screw 106. This screw is carried by a bracket 107 which in turn is carried by the section 95. The bracket is connected to the section 95 by a clamping bolt 108 and is adjustable within the range of a slot 109 through which the clamping bolt extends. The stop screw 106 is arranged to abut against a fixture such as one of the stationary bearings 91 to determine the operative position of the heel with regard to the motion about the pivot 94.

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

1. That improvement in methods of shaping unattached heels which consists in securing such a heel temporarily in fixed relation to form-controlling means, shaping the periphery of the heel by trimming it along a predetermined course controlled by said means while turning and rocking the heel in tangential relation to a cutter rotating about a fixed axis, and shaping the breast of the heel by trimming it along a course constrained by said means to bear a predetermined standardized relation to said course of peripheral trimming.

2. That improvement in methods of shap-

ing unattached heels which consists in securing such a heel temporarily between and in fixed relation to two templets, shaping the periphery of the heel by trimming it while supporting and moving the heel and said templets manually in cooperative relation to a fixed field of trimming thereby controlling the course of such trimming by said templets, and shaping the breast of the heel secured as aforesaid by trimming it along a course bearing a predetermined standardized relation to the course of peripheral trimming.

3. That improvement in methods of shaping unattached heels which consists in securing such a heel temporarily to an integral unit including shape-controlling elements, shaping the periphery of the heel by trimming it to a predetermined contour controlled by said unit while turning and otherwise moving the latter manually in cooperative relation to a cutter rotating about a fixed axis, and shaping the breast of the heel by trimming it along a course constrained by said unit to bear a predetermined standardized relation to said contour.

4. That improvement in methods of shaping unattached heels which consists in securing such a heel temporarily in fixed relation to holding means having shape-controlling formations, shaping the periphery of the heel by trimming it to a predetermined contour controlled by said holding means while manipulating the latter with compounded motions in cooperative relation to a cutter rotating about a fixed axis, and shaping the breast of the heel by trimming it along a course curved from top to bottom and constrained by said holding means to bear a predetermined standardized relation to said contour.

5. That improvement in methods of shaping unattached heels which consists in securing such a heel temporarily in fixed relation to shape-controlling means, performing two successive trimming operations by one of which the periphery of the heel is trimmed circumferentially and by the other of which the breast is trimmed from side to side, and controlling the course of trimming in each of said operations by said means to insure a final predetermined standardized shape and size of the heel.

6. That improvement in methods of shaping shoe-parts which consists in jigging such a part, and shape-controlling means in a bodily movable clamping unit, shaping a portion of such part by trimming it along a predetermined course controlled by said means, to bear a standardized relation thereto, jigging said clamping unit in a predetermined standardized relation to a trimming instrumentality, and causing said instrumentality to shape another portion of said part by trimming it along a course bearing a predetermined relation to the position given to said part by jigging said unit.

7. That improvement in methods of shaping shoe-parts which consists in clamping a shoe-part in a portable clamping unit including a templet, trimming a portion of said part to a predetermined shape controlled by said templet, jigging said unit in a predetermined standardized relation to a trimming instrumentality and causing said instrumentality to trim another portion of said part to a predetermined shape by traversing a course bearing a predetermined relation to the position given to said part by jigging said unit.

8. That improvement in methods of shaping unattached heels which consists in causing two templets to clamp such a heel between them by engaging the top and bottom, respectively, of the heel, shaping the periphery of the heel by relatively moving the latter and a trimming instrumentality in cooperative relation to each other and constraining such trimming to a predetermined course controlled by said templets simultaneously, jigging said templets to position the heel in a predetermined relation to another trimming instrumentality, and causing the latter to trim the breast of the heel.

9. That improvement in methods of shaping heels which consists in trimming the periphery and the breast of a heel to standardized shapes by successive trimming operations, holding the heel by a portable clamping unit continuously throughout both of said operations, and using said clamping unit to obtain a standardized relation between the peripheral shape and the breast shape.

10. That improvement in methods of shaping heels which consists in trimming the periphery and breast of a heel by circumferential progression while the heel is maintained in constant relation to means for standardizing the relation between the trimmed breast and the trimmed periphery.

11. That improvement in methods of shaping heels which consists in clamping a heel in cooperative relation to means for determining a standardized relation between the final breast shape and peripheral shape, trimming the periphery and breast of the heel to dissimilar curved profiles by successive operations and using said means in each of said trimming operations to obtain said standardized relation.

12. That improvement in methods of shaping heels which consists in clamping a heel in a holder, trimming the periphery of the heel and simultaneously using said holder to obtain a predetermined peripheral contour, relatively jigging the holder and a breast-trimming cutter to obtain a predetermined standardized relation between the breast shape and peripheral shape, and trimming the breast to a curved profile with said cutter while the

holder and cutter are jigged according to said standardized relation.

13. An apparatus for shaping heels comprising means for trimming the periphery of an unattached heel to a predetermined profile, a portable holder for presenting an unattached heel to said means and for manipulating the heel to shape the periphery, templets carried by said holder and guards associated with said trimming means to cooperate with said templets to insure a predetermined course of peripheral trimming, means for trimming the breast of the heel to a predetermined shape, and means for locating said holder in a predetermined position relatively to said breast-trimming means so that the course of breast trimming will bear a predetermined relation to the trimmed periphery.

14. An apparatus for shaping heels, comprising a portable unit having means for clamping an unattached heel by its top and base surfaces, trimming means formed to trim the periphery of the heel to a predetermined profile, said clamping means and guards associated with said trimming means being formed and arranged to cooperate to insure a predetermined course of peripheral trimming, means for trimming the breast of the heel from side to side to a predetermined profile, and means for relatively locating said unit and said breast-trimming means to insure a predetermined relation between the trimmed breast and the trimmed periphery.

15. An apparatus for shaping heels, comprising trimming means adapted to impart a predetermined profile to the periphery of a heel, trimming means adapted to trim the breast of the heel from side to side, means adapted to hold an unattached heel and present it to said two trimming means successively, means constructed and arranged to determine the course of peripheral trimming according to a predetermined standard, and means constructed and arranged to determine the course of breast trimming according to a predetermined standard.

16. That improvement in methods of shaping unattached heels which consists in clamping such a heel by its top and bottom faces and performing two successive trimming operations while it is so clamped and maintained in fixed relation to its clamping means, by one of which trimming operations the periphery of the heel is shaped and by the other of which the breast is trimmed from side to side.

In testimony whereof I have signed my name to this specification.

LESTER S. MACDONALD.