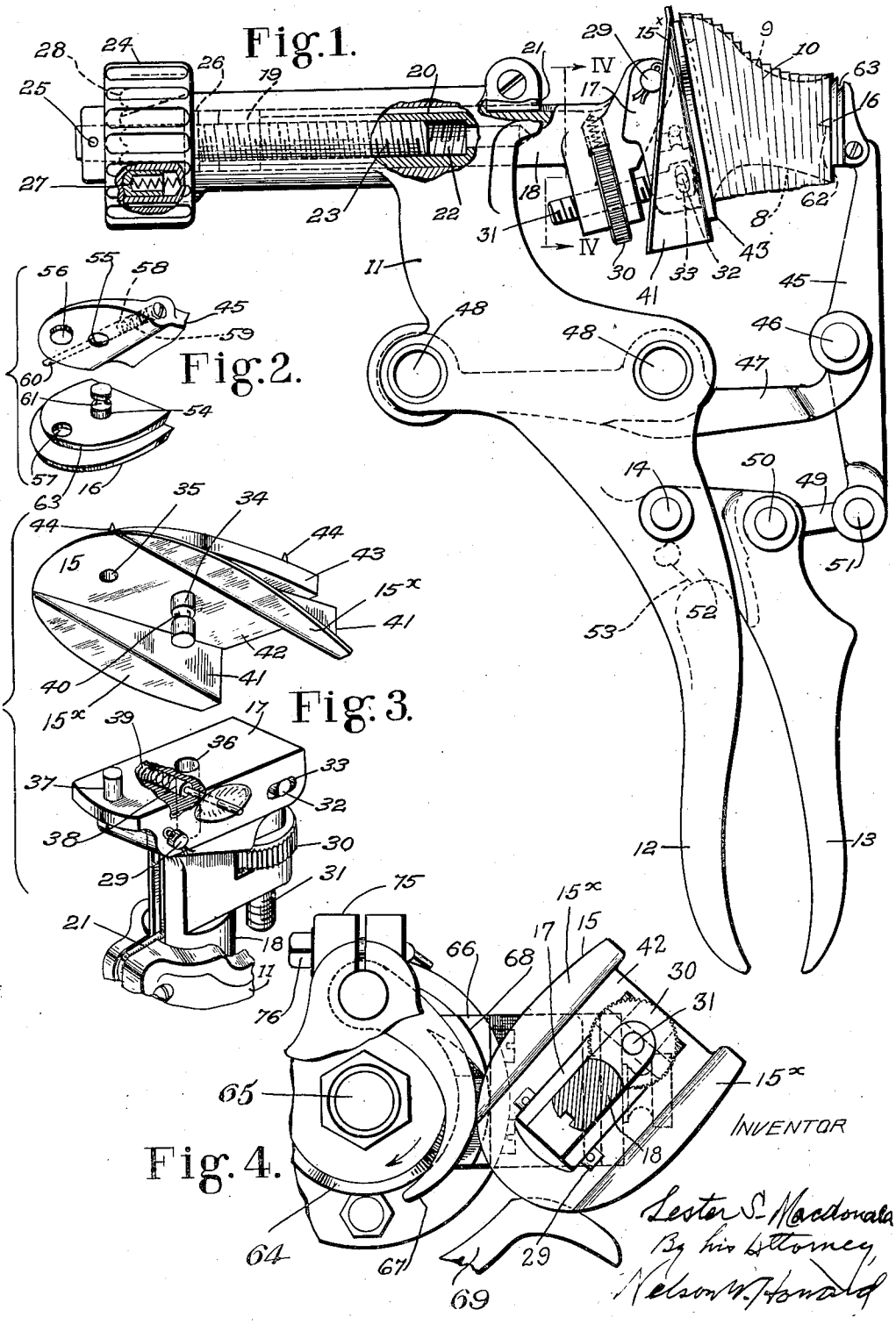
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HEEL CLAMPING DEVICE

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HEEL-CLAMPING DEVICE

Original application filed November 20, 1922, Serial No. 602,120. Divided and this application filed February 3, 1928. Serial No. 251,682.

This invention relates to apparatus for use in shaping unattached heels and is illustrated as embodied in a clamp or holder for grasping such heels and for presenting them to cutting means by which the heels are to be shaped. The illustrated clamp or holder is disclosed in my application Serial No. 602,120, filed November 20, 1922, the present application being a division of the aforesaid application.

In the shoe repairing trade it is necessary in some cases to furnish fully shaped high heels, including Louis heels, to replace worn or damaged heels of women's shoes, but, owing to the great variety of styles in proportion to the number of replacement heels required of a repair shop, few, if any, repair shops are equipped with suitable machines for shaping high heels. To meet these conditions some manufacturers have undertaken the manufacture of fully shaped high heels for distribution to the repair trade.

In the production of fully shaped, unattached, high heels for the purpose explained above, and as more fully disclosed in my said application Serial No. 602,120, the shaping of the heels must be performed without any shoes to hold the heels or to control or guide the shaping of them. Accordingly, it has been proposed to place the heels successively in a light, portable holder adapted to clamp a heel by its attaching face and its top-lift face and to use the holder to present the heel to the cutter or cutters of a heel-trimming machine. Moreover, to insure the desired shape as well as uniformity of heels intended to be exactly alike, some means must be provided to control the shaping operation so that both the attaching face and the top-lift face of the shaped heel will conform to predetermined standards. Various types of heel clamps or holders for this use have heretofore been proposed but for one reason or another they have not fulfilled all the various requirements and have not been entirely satisfactory.

In view of the conditions above explained, the present invention provides an improved heel clamp or holder designed to facilitate rapid and accurate production of fully shaped, unattached heels of the type referred to. Accordingly, a novel feature of the invention consists in a heel clamp or holder provided with cooperative clamping jaws and improved means for securing detachable heel templets to said jaws, to the end that templets of various shapes and sizes may be quickly substituted one for another, as occasion requires.

A characteristic of high heels is the so-called "wedge," that is, the angular relation between the attaching face and the top-lift face. This wedge is greater in some heels than in others, the highest heels usually having the greatest degree of wedge. The non-uniformity of heels in this respect creates the problem of providing for secure and otherwise satisfactory clamping of all the various types of heels in one holder. Therefore, to meet this problem a novel feature of the present invention consists in a heel clamp or holder having cooperative, relatively movable, clamping members, and provision for relatively adjusting them to various angular relations independently of the mechanism by which their relative clamping movement is effected.

Again, it is often the case that heels of one lot differ from those of another lot in the matter of height. Therefore, with this condition in view, still another feature of the invention consists in an improved construction that provides not only for relatively adjusting the cooperative clamping members according to the angle of the wedge, but also for relatively adjusting them according to the height of the heel, and that also provides for effecting each of these adjustments independently of the other and independently of the mechanism by which the clamping movement is caused.

The novel features above mentioned, as well as others, are hereinafter described with reference to the accompanying drawings and are pointed out in the appended claims.

Referring to the drawings,

Fig. 1 is a side elevation of a portable heel clamp constituting a preferred embodiment of the invention, an untrimmed heel blank being clamped thereby;

Fig. 2 is a perspective view including a de-

tachable templet for engaging a top lift and a portion of the clamping jaw that carries said templet;

Fig. 3 is a perspective view, including a templet for engaging the attaching face of the heel and a portion of the jaw by which said templet is carried; and

Fig. 4 is a sectional view, indicated by line IV—IV of Fig. 1 but showing the device in cooperative relation to a rotary cutter head of a heel-trimming machine.

To facilitate reference to my aforesaid application Serial No. 602,120, the reference numerals used therein are used to designate the same elements as shown in this application.

A rough heel blank 10 of the type comprising a plurality of leather or leather board lifts is first placed in a portable heel clamp or carrier as shown in 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 which constitutes one half of hand grip for two relatively movable heel clamping jaws, the other half of the grip being afforded by a relatively movable handle member 13 connected to the frame by a pivot 14. One of the relatively movable jaws by which the heel blank is clamped carries a templet 15 and the other carries a templet 16. The confronting faces of these templets engage, respectively, the attaching face and the untrimmed top lift of the heel blank. The jaw that carries the templet 15 comprises an angularly adjustable head 17 and an axially adjustable 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 axial adjustment of the shank 18 relatively to the frame 11 the shank is bored and tapped and its internal screw-thread 22 is occupied by an adjusting screw 23. A hollow hand-wheel 24 is affixed to the outer end of the screw by 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. These elements prevent end-play of the adjusting screw but permit rotation thereof. This construction provides for adjusting the stationary jaw in a right line according to the height of the heel. A spring-stressed follower 27 is arranged in a socket formed in the frame 11 to hold the adjusting screw 23 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.

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. Such angular adjustment is effected and all positions of adjustment are positively maintained by a thumb nut 30 and screw 31, one end of the screw being connected to the head 17 by a transverse pin 32, and the head having slots 33 in which the ends of the pin are arranged to prevent binding of the parts. The nut 30 is embraced by and the screw extends through confronting portions of the shank member 18. A spring follower 7 engages the milled periphery of the nut 30 to prevent accidental turning of the latter. It is to be observed that the angular adjustment of the head 17 and the rectilinear adjustment thereof may be effected independently of each other. Moreover, as hereinafter shown, either or both of these adjustments may be changed independently of the mechanism by which relative clamping movement of the jaws is effected. This independence of adjustment, on the one hand, and clamping movement, on the other hand, is particularly advantageous in a device of the type shown in which the movable clamping jaw is moved by its operating mechanism to the same operative position in all cases.

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 notch or 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. A hole formed in the templet gives access to the projecting end of the locking pin.

The templet 15, as shown, is made of sheet metal, which construction is both economical and advantageous for wedge heels, since the sheet metal may be pressed to provide marginal wings or flanges 15^{x}, and confronting wedge-shaped web portions 41, 41 approximating in degree the wedge angle of the heel. The portions 41 counteract the wedge angle to permit the flanges 15^{x} (which furnish portions of the effective contour of the templet) to lie in a plane substantially parallel to the plane of the top lift of the

heel. The wedge-shaped portions 41 are connected by a body portion 42 the rear edge of which furnishes an intermediate portion of the effective contour of the templet 15 and merges with the edges of the flanges 15× as shown in Figs. 1, 3 and 4. The body portion 42 is provided with a convex heel-engaging plate 43 designed to conform to the concavity of the attaching face of the heel. The plate 43 may be permanently connected to the body portion 42 in any desired way such as by welding or by rivets. The plate 43 is preferably provided with spurs 44 to indent the attaching face of the heel and thereby prevent the latter from slipping. As shown, there are three such spurs, one at the back and one near each breast corner.

The templet 16 is a flat plate carried by a movable clamping jaw 45 the operative position of which is constant relatively to the frame 11. As shown, this jaw is in the form of a lever and has a pin 46 for its fulcrum. The anchorage for the pin 46 is formed by a 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 mechanism for operating the jaw 45 comprises toggle links, since such mechanism affords a maximum of clamping stress with a minimum of applied force, is adapted to furnish clamping movement of constant amplitude in every case, is double-acting with regard to moving the jaw in opposite directions, and is self-retaining in clamping position, provided it is designed to cross the dead-center position. To provide toggle mechanism for this purpose a portion of the handle member 13 may be utilized as one of two cooperative links. 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 jaw 45, 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 the center pivot 50 of the toggle across the dead center, whereupon two cooperative abutments 52, 53 immediately arrest the movement to prevent 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. 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 provide for the substitution of other templets differing one from another 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 notch or groove 61 formed in the pin 54. Each templet 16 is preferably provided with a spur 62 to indent the toplift of the heel so that the latter will not slip. The periphery of the templet is used to determine the contour to be imparted to the top lift of the heel. A groove 63 is preferably formed in the periphery 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 equivalent to that of the forepart of a shoe relatively to the heel thereof. The hand-wheel 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 either to a heel-breasting machine or to a machine for trimming the periphery. Fig. 4 illustrates a portion of a well-known type of commercial trimming machine supplemented with guards formed and arranged to cooperate respectively with the templets 15 and 16 to insure shaping the sides and back of the heel according to a predetermined standard. 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. The cutters are shaped to impart a desired profile to the heel, for example, the profile represented by a dotted line 9 in Fig. 1.

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 thin rib 68 adapted to run in the groove 63 of the templet, but the guard 67 preferably

has a plain, substantially cylindric surface on which the perimeter of the templet 15 will bear so that the point of contact may shift toward and from the guard 66 without appreciable resistance. The trimming machine is also provided with a stationary heel-rest 69. These elements are sufficient to insure uniform shaping, 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 a predetermined result is assured. As the angle of the heel carrier changes in consequence of rocking it the rib 68 and the groove 63 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 lateral deviation of the top lift relative to the cutters. 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 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, according to the dimensions of the cutters, the heels and the templets. The clamping portions of the fixture 75 are tightened by a bolt 76.

As hereinbefore stated, the arm 47 of the heel-clamping device is rigidly connected to the frame 11 by two anchoring members 48. These anchoring members may be utilized for the additional purpose of registering the clamped heel in a certain predetermined relation to the trimming cutter of a machine for trimming the breast of the heel. Such a machine is disclosed in my aforesaid application Serial No. 602,120 as comprising a reciprocatory cutter adapted to trim the breast of the heel from side to side and to impart to the heel a breast face of the shape represented by a broken line 8 in Fig. 1 of the drawings of this application. Moreover, the said breast-trimming machine is provided with two dowels or jig pins adapted to cooperate with the above-mentioned anchoring members 48 for the purpose of insuring the desired position of the clamped heel with regard to the path of the breasting cutter. In view of this latter function the tubular form of the members 48 is preferable, since it provides the heel-clamp or holder with sockets to receive the jig pins but does not encumber the heel-clamp with any projecting element.

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

1. A device for holding an unattached heel comprising relatively movable jaws connected to each other in cooperative clamping relation and provided with plates one to engage the attaching face of a heel while the other engages the toplift face thereof, means carried by one of said jaws to adjust and maintain the plate thereof in various angular relations to the other one of said plates according to the wedge angle of the heel, and means for relatively moving said jaws to clamp the heel.

2. A device for holding an unattached heel comprising a frame having a stationary jaw, a movable jaw carried by said frame, said jaws being provided with plates one to engage the attaching face of a heel while the other engages the top lift face thereof, means carried by said stationary jaw to adjust and maintain the plate thereof according to the wedge angle of the heel, and means carried by said frame for moving said movable jaw to clamp the heel.

3. A device for holding an unattached heel comprising a frame, a stationary jaw and a movable jaw carried by said frame, plates carried by said jaws, respectively, one to engage the attaching face of a heel while the other engages the top-lift face thereof, said stationary jaw being adjustable toward and from said movable jaw according to the height of the heel, and one of said plates being angularly adjustable relative to its jaw according to the wedge angle of the heel, and means carried by said frame for imparting clamping movement of constant amplitude to said movable jaw.

4. A device for holding an unattached heel comprising a frame, a stationary jaw and a movable jaw carried by said frame, said jaws being provided with plates one to engage the attaching face of a heel while the other engages the top lift face thereof, means for adjusting said stationary jaw toward and from said movable jaw according to the height of the heel, means carried by said stationary jaw for effecting and maintaining angular adjustment of the plate carried thereby according to the wedge angle of the heel, and means carried by said frame to impart clamping movement of constant amplitude to said movable jaw.

5. A device for holding an unattached heel comprising a frame, a stationary jaw and a movable jaw carried thereby, said stationary jaw being adjustable toward and from said movable jaw, a member carried by and pivotally connected to said stationary jaw, said member and said movable jaw being provided

with plates for engaging respectively the attaching face and the top lift face of a heel, means arranged to effect and maintain angular adjustment of said member in accordance with the wedge angle of the heel, and means provided with toggle links for operating said movable jaw to clamp the heel.

6. A device for holding an unattached heel comprising a frame, a stationary jaw and a movable jaw carried thereby and arranged to clamp a heel by its attaching face and its top lift face, operating mechanism provided with toggle links for moving said movable jaw toward and from said stationary jaw, and means for adjusting said stationary jaw toward and from said movable jaw.

7. A portable unit for holding an unattached heel comprising a frame, a stationary jaw and a movable jaw carried thereby and arranged to clamp a heel by its attaching face and its top-lift face, the said jaw for engaging the attaching face having an angularly adjustable heel-engaging part adapted to counteract the wedge angle of the heel, means for adjusting said stationary jaw toward and from said movable jaw according to the height of the heel, and operating mechanism for moving said movable jaw in every case to the same operative position to clamp the heel.

8. A device for holding an unattached heel comprising a frame, a stationary jaw adjustably secured thereto, a movable jaw carried by said frame, said jaws being arranged to clamp a heel by its attaching face and its top-lift face, operating mechanism provided with toggle links for moving said movable jaw to and from one invariable operative position corresponding substantially to the dead-center position of said links, and means for adjusting said stationary jaw to regulate the space available for a heel when said toggle links are at their dead-center position.

9. A device for holding an unattached heel comprising a frame, a stationary jaw and a movable jaw carried by said frame, templets carried by said jaws respectively to clamp a heel by its attaching face and its top-lift face, said jaws and said templets having, respectively, sockets and dowels for connecting them, said dowels having retaining grooves and said jaws being provided with spring-stressed retaining elements arranged to cooperate with said grooves, and operating means carried by said frame for imparting clamping movement to said movable jaw.

10. A portable unit for holding an unattached heel comprising a frame provided with cooperative clamping jaws, cooperative templets carried by said jaws, respectively, to clamp a heel by its attaching face and its top-lift face, one of said templets having a peripheral groove adapted to receive and cooperate with a rib to maintain the heel against lateral displacement relative to a heel-shaping cutter, and means carried by said frame for relatively moving said jaws to clamp a heel between said templets.

11. A portable unit for holding an unattached heel comprising a frame provided with means adapted to clamp a heel by its attaching face and its top-lift face, said frame being also provided with sockets to receive jig pins for registering the clamped heel relative to a cutter adapted to shape the breast of the heel.

12. A portable unit for holding an unattached heel comprising a frame provided with clamping means and templets adapted to clamp a heel by its attaching face and its top-lift face, said templets being also adapted to co-operate with guards to control the shaping of the sides and back of the clamped heel by a trimming cutter, and said frame having sockets adapted to receive jig pins for registering the heel relative to a heel-breasting cutter.

13. A heel carrier comprising a frame provided with two cooperative members, one stationary and the other movable, for clamping a heel by its attaching face and its top-lift face, and means for actuating said movable member to clamp the heel, said stationary member being angularly adjustable according to the wedge angle of the heel.

14. A heel carrier comprising a frame provided with two cooperative members, one stationary and the other movable, for clamping a heel by its attaching face and its top-lift face, and means for actuating said movable member to clamp a heel, said stationary member being adjustable angularly and otherwise according to the wedge angle and height of the heel.

15. A heel carrier comprising a frame provided with a stationary templet and a movable templet arranged to clamp a heel by its attaching face and its top-lift face, means for adjusting said stationary templet to suit the height of the heel, means to adjust said stationary templet angularly to suit the wedge angle of the heel, and means for operating the movable templet to clamp the heel.

16. A heel carrier comprising a frame having a bore, a shank arranged to slide longitudinally in said bore, a head carried by and pivotally connected to said shank outside said bore, means for adjusting said shank lengthwise, means for adjusting said head angularly relative to said shank, a templet carried by said head, and means including another templet for clamping a heel against the first said templet.

17. A heel carrier comprising a frame having cooperative jaws for clamping a heel, and mechanism for relatively moving said jaws to clamp a heel between them, each of said jaws being provided with a detachable heel-engaging templet, dowels for locating the

templet, and a spring-stressed locking device for holding the templet attached so that it may be released by displacing said device against the spring stress.

18. A heel carrier comprising a frame having cooperative jaws for clamping a heel, and mechanism for relatively moving said jaws to clamp a heel between them, each of said jaws being provided with a detachable heel-engaging templet, means for registering the templet, and means movable to one position to lock the templet and to another position to release it.

19. A templet for engaging a concave attaching face of a high heel, provided with a convex surface constituting a counterpart of such concave attaching face with a perimetral guiding portion angularly related to said convex surface to counteract the wedge angle of the heel so that said guiding portion will be substantially parallel to the top-lift face of a heel seated on said convex surface.

20. A sheet metal templet formed to provide confronting wedge-shaped web portions, a body portion connecting said web portions, and flanges projecting laterally from said web portions, said flanges and the rear edge of said body portion being merged and furnishing the perimetral contour of the templet, said body portion being provided with a convex seat for the concave attaching face of a high heel and said web portions being shaped to counteract the wedge angle of the heel so that said flanges will be substantially parallel to the top-lift face of the heel.

21. A device for holding an unattached heel comprising a frame provided with cooperative clamping jaws, a templet carried by one of said jaws for engaging the top-lift face of a high heel, a wedge-shaped unit carried by the other one of said jaws, said unit having a seat for the attaching face of the heel and a perimetral flange constituting a templet, said seat being angularly related to said flange to counteract the wedge angle of the heel so that said flange will be substantially parallel to said top-lift templet, and means for relatively moving said jaws to clamp the heel.

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

LESTER S. MACDONALD.