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METHOD OF AND MEANS FOR ATTACHING HEELS TO SHOES

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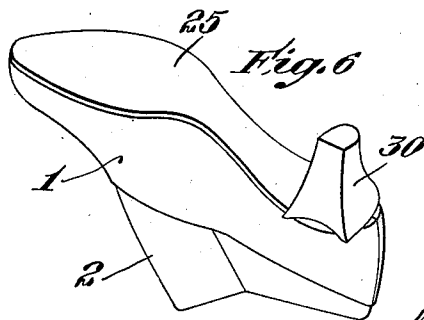
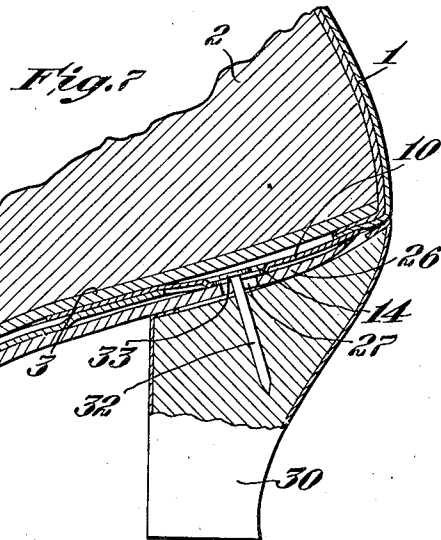
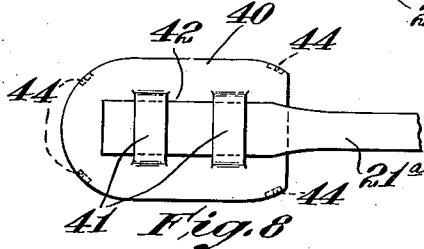
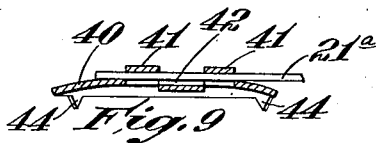
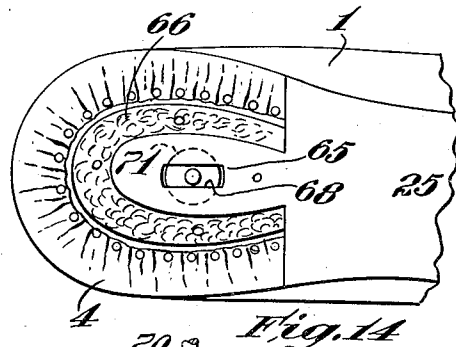
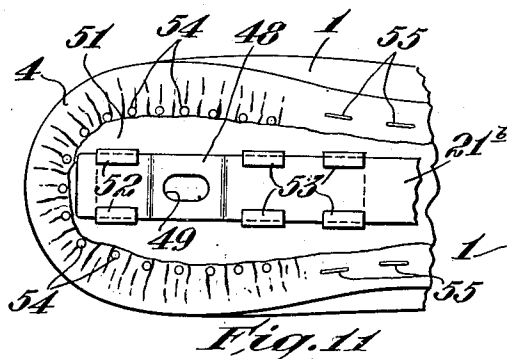
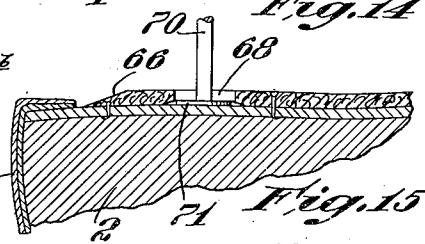
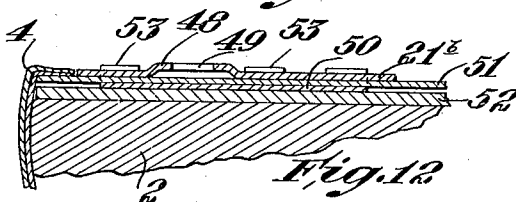
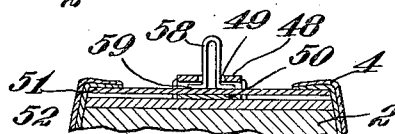


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UNITED STATES PATENT OFFICE

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METHOD OF AND MEANS FOR ATTACHING
HEELS TO SHOESEdward H. Bastable, Clifton, Mass., assignor to
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This invention relates to the manufacture of shoes, and more particularly to an improved method of and means for attaching the heels to the uppers.

In accordance with conventional shoe-making practices the upper and insole are assembled about the last and lower edges of the counter, liner, quarter, etc., are inturnd over the under-surface of the insole and tacked, stapled, or otherwise held in place. Where glue or other cementitious material is to be employed in conjunction with metallic fastening elements, the last is provided with a hole in its heel portion to receive a screw or the like fastening element which may be inserted in the hole and driven through the insole into the body of the heel. Such a fastening element may serve either as a permanent fastening means, or as a means for temporarily clamping the heel in position during the period required for the cement to set, after which the fastening element is removed. Where the heel has not been predrilled to receive the fastening element, considerable difficulty is encountered in embedding such fastening elements in the body of the heel without splitting it and where, as is common, such heels are of wood, it is practically impossible to use fastening elements having a shank of sufficient length to insure a satisfactory anchorage.

To overcome these difficulties the heels are predrilled to receive the fastening elements, and although this procedure is effective to minimize, if not eliminate splitting of the heel, yet it has given rise to another problem in that it is practically impossible to locate the hole with any degree of accuracy unless the heel is positioned against the heel seat of a lasted shoe during the drilling operation, in which case a power actuated drill is inserted in the opening of the last so as to bore a hole which extends through the insole into the body of the heel. In such procedures the drill is removed to permit the insertion of either a temporary fastening element or a permanent fastening element which remains embedded in the heel. In such procedures the drilling operation results in the production of chips which not only interfere with proper nailing, but also work into the cementitious layer and adversely affect the adhesive bond between the heel and heel seat.

Moreover, in applying such fastening elements there is a tendency to raise or separate the insole structure from the heel, thus providing a gap which renders it difficult, if not practically impossible, to obtain a satisfactory adhesive bond.

Hence, it is usually necessary to supplement the procedure with a subsequent nailing operation. Due to the hole formed in the heel portion of the insole, the uneven surface contour of the heel resulting from the raised area surrounding the hole, and the presence of the ends of the fastening elements (the nails and/or anchoring screw), it is, of course, necessary to provide a heel pad or the like so as to cover the ends of the fastening elements and protect the heel of the wearer from discomfort which would otherwise result.

Although numerous attempts have been made to overcome these objectionable features, I am not aware of anyone who has provided a commercially satisfactory solution. For example, it has been proposed to secure the fastening element either to the insole structure or to an anchoring plate which is secured to the insole structure and to embed the shank of the fastening element in a preformed hole in a body of the heel, or to drive the fastening element directly into the heel. Although such procedures permit the use of relatively long-shank fastening elements, they are nevertheless unsatisfactory due to the fact that as the fastening element is permanently and immovably positioned relative to the insole structure, it can not be adjusted, and as a practical matter it is quite difficult, if not impossible, either accurately to position the heel or to drill a preformed hole therein, as the case may be, so that when the heel is assembled its upper edges will fit about the edges of the upper with the degree of exactitude necessary for a salable product.

The use of various types of anchoring plates have also been proposed, such plates being formed or provided with prongs or the like elements adapted to engage both the heel and the insole structure. However, such plates are not only subject to the aforementioned objectionable features, but furthermore are incapable of securing the heel to the insole structure without the use of supplemental fastening means which are difficult to apply because of the presence of the plate.

The principal objects of the present invention are to overcome the aforementioned objectionable features and to provide a simple and efficient method of attaching a heel to a shoe, which method eliminates the use of expensive machinery, which permits the use of long-shank fastening elements, and which not only decreases the cost of manufacture but also increases the strength and wearing qualities of the finished shoe.

Other objects are to provide a novel means for securing the heel to the insole structure, which

means is of simple construction having but few parts, which is effective and reliable in operation and which can be manufactured and sold at a relatively low cost; to provide an improved shoe structure in which the heel is not only secured to the insole but also to the structure of the upper; and to provide a shoe structure in which the attaching means cooperate with a shank piece to form a reinforcement for the entire shoe, which does not impair the flexibility of the shoe or its wearing comfort.

Further objects will be apparent from a consideration of the following description and the accompanying drawings, wherein:

Fig. 1 is a perspective view of a lasted shoe upper before the application of a heel fastening means constructed in accordance with the present invention;

Fig. 2 is an enlarged top plan view of one form of heel plate and shank assembly for use in securing a heel to a shoe upper in accordance with the present invention;

Fig. 3 is a side elevation, partly in section, of the assembly shown in Fig. 2;

Fig. 4 is an enlarged fragmentary top plan view of the heel plate and shank piece assembled with the lasted shoe upper shown in Fig. 1;

Fig. 5 is a perspective view of a heel provided with one form of fastening element for securing the heel to the upper;

Fig. 6 is a perspective view of a lasted shoe with the outsole applied and the heel partially applied,—illustrating the preferred manner of attaching the heel to the upper;

Fig. 7 is an enlarged fragmentary elevation, partly in section, illustrating the construction of a shoe made in accordance with the present invention and embodying the assembly shown in Fig. 2;

Fig. 8 is a top plan view of another form of heel plate and shank assembly;

Fig. 9 is a longitudinal section through the assembly shown in Fig. 8;

Fig. 10 is a transverse section through the assembly shown in Fig. 8 and illustrating another form of fastening element;

Fig. 11 is a view similar to Fig. 4, but illustrating another modification;

Fig. 12 is a fragmentary longitudinal section through the structure illustrated in Fig. 11;

Fig. 13 is a transverse section through the structure of Fig. 11, but showing a fastening element assembled therewith;

Fig. 14 is a view similar to Fig. 4, but illustrating another manner of attaching a heel to a shoe; and

Fig. 15 is a longitudinal section through the structure shown in Fig. 14 and illustrating another type of fastening element assembled therewith.

In accordance with the present invention a shoe upper and an insole may be lasted in any of the conventional ways, the lower edges of the upper being turned over the undersurface of the insole structure which may include a fiber reinforcement or the like, and are secured in place by tacks, staples or other suitable means. An anchoring element, preferably shaped to fit the heel seat cavity, is positioned over the heel area and either before or after such positioning, a layer of glue or other cementitious material may be applied. The anchoring element may comprise a metallic plate, the end of a shank piece, the trimmed heel portion of an outsole, or the equivalent, and it is preferably formed with

a central opening or slot of sufficient size to permit the shank of a fastening element, such as a screw, headed nail, metallic clasp or the like, sufficient freedom of movement, both laterally and longitudinally, to compensate for the maximum error which would be encountered in locating either a predrilled hole in the heel to be attached or the point of application of such fastening element when assembling the heel with the lasted upper. If desired, in place of using a fastening element having a headed end in conjunction with an anchoring element provided with a slot or opening, substantially the same advantageous results may be obtained by the use of a clip or the like element having inturned jaws or ends, in conjunction with an anchoring element having a part so constructed and arranged as to be engageable by the jaws of the clip so as to permit longitudinal and lateral movement of the entire fastening element. With this construction it is preferable to provide a heel having a predrilled hole shaped to receive the shank of the fastening element or clip so that the heel may be applied and accurately positioned prior to being subjected to pressure or pounding effective completely to embed the shank in the body of the heel.

In either case the anchoring element is preferably secured to the insole structure and/or upper and the heel may be predrilled either before or after applying the fastening element, depending upon the particular type of fastening element to be used, as well as the type of anchoring element employed. Where, as is preferred, the fastening element comprises a shank having a headed or bent end, it is applied so that its headed end is engageable with the marginal portions surrounding the opening or slot in the anchoring element, and the manner of attachment of anchoring element to the insole and/or upper is such as to allow sufficient freedom of movement of the fastening element to permit the heel to be accurately positioned.

Where the anchoring element comprises a metallic plate or shank piece having either an elongate opening or slot, constituting in effect, one of a pair of cooperating interlocking parts, it may be secured to the insole and/or upper in any suitable manner, and a layer of cement may then be applied to its exposed surface and the adjacent parts of the inturned upper. A fastening element having an elongate head or bent end may be applied directly to the heel, the major portion of its shank being embedded in the body of the heel with its bent or headed end spaced outwardly from the upper surface of the heel. The heel may then be manipulated so that the headed end of the fastening element passes through the opening in the anchoring element and becomes engaged between the margins surrounding the slot or opening and the outer surface of the insole structure, the parts being so constructed and arranged that when the fastening element is partially embedded in the heel sufficient freedom of movement is permitted to allow an accurate positioning of the heel, irrespective of any inaccuracy in locating the hole or embedding the shank of the fastening element in the heel. With the heel thus applied to the heel seat of the lasted shoe and properly positioned thereon, it may then be pressed or pounded against the heel seat so that the shank of the fastening element is forced the rest of the way into the body of the heel. The fastening element is not only more effective to hold the heel clamped against the seat during the period required for

the cement to become set, but also provides a fastening means which is effective securely to hold the heel to the insole structure and/or shoe upper.

Where the anchoring element comprises a part of the outsole trimmed down to provide a heel seat, it may be provided with an opening through which the shank of a headed fastening element may be inserted prior to attachment to the insole structure and/or upper so that the fastening element is permitted longitudinal and lateral movement as above described. With this construction the layer of cement may be applied to the outer surface of the heel seat defined by the end portion of the outsole and, if desired, a hole may be drilled in the heel to receive the shank of the fastening element. Even though the hole in the heel may be inaccurately located, the size and shape of the opening in the heel seat permits sufficient movement of the fastening element to compensate for any inaccuracies and hence when the heel is applied so that the hole therein receives the fastening element, it may be properly positioned prior to forcing the shank of the fastening element completely into the body of the heel. It is to be understood that if desired cement may be applied to the upper surface of the heel and to the hole therein so as to enhance the holding power of the fastening element.

Referring to the drawings, Fig. 1 shows a shoe upper 1 applied about a last 2 with its lower edges 4 inturned about the insole structure 5 and held in position by a row of lasting tacks 6, it being understood that the lasting of the upper and insole structure may be in accordance with any of the conventional shoe-making practices. At this stage of the procedure a layer of glue or other cementitious material may be applied, although, if desired, the application of the cementitious material may be deferred until after the application of a shank piece and/or anchoring element assembly, presently to be described.

Referring to Figs. 2 and 3, the anchoring element comprises a metal plate having a body portion 10 conforming substantially to the outline of a heel seat of a shoe and preferably of concavo-convex contour, as illustrated more clearly in Fig. 3. The body portion 10 is formed with a substantially central elongate opening 11 surrounded by raised margins 12 which define a recess 14 (Fig. 3) on the underside of the plate. The periphery of the plate is provided with a plurality of circumferentially spaced radially extending arms 15 which may be of arcuate cross section, and between certain of these arms there are prongs which extend downwardly substantially at right angles to the body of the plate. For reasons hereinafter pointed out, alternate arms 15 are bent downwardly below the level of the other arms, as shown in Fig. 3. The front end of the plate is provided with an extension 18 having lateral wings 20 which are bent upwardly about the rear end of a reinforcing shank piece 21, these parts being so constructed and arranged that the effective length of the shank piece 21 may be varied in accordance with the size of the shoe to which the assembly is to be attached. In any event the size of the anchor plate-shank piece assembly should be such as properly to fit against the insole structure so as to avoid the necessity of making an adjustment after application to the lasted shoe.

After having prepared the anchor plate-shank piece assembly, it may then be applied so that the shank piece 21 extends longitudinally of the

shoe and the body portion 10 of the anchor plate is positioned to register with the area of the insole structure 5 which lies between the inturned edges 4, with the alternate or downwardly bent arms 15 contacting the junction of the insole structure and inturned edges. With the parts thus positioned, pressure or other suitable driving force may be applied to the plate 10 with the result that the alternate or downwardly bent arms 15 are forced in between the insole structure and inturned edges of the upper, while the other arms 15 are positioned against the outer facing of the inturned edges and the prongs 16 are embedded or clenched in the insole structure, as shown in Fig. 4. Thus, the anchoring plate 15 is firmly secured not only to the insole structure, but also to the upper, it being noted that the arms 15 provide, in effect, fingers which hold the inturned edges 4 of the shoe upper 1 firmly in position.

After having applied the anchor plate and shank piece, the front end of the latter may be secured in any suitable manner, and a layer of glue or other cementitious material may be applied over the heel portion of the shoe, or the entire area, if desired. A previously prepared outsole 25 may now be applied, the forepart being attached in any conventional manner, as by stitching. If desired the rear part of the outsole may be cut off a short distance ($\frac{3}{8}$ of an inch more or less) back of the breast line of the heel, or a full length outsole may be used, in which case the heel area is trimmed down, as shown at 26 (Fig. 7), to form a heel seat, and a central opening 27 is formed therein, which opening should substantially conform in size and location to the opening 11 in the plate 10 so that both openings will register when the outsole is applied, as shown in Fig. 7. After the outsole has been attached a layer of cement may be applied to the heel seat preparatory to receiving the heel.

In the meantime a heel 30 to be applied is prepared by partially embedding in its body portion a fastening element, here shown as a headed nail 31 having a shank portion 32 and an elongate head 33 shaped similar to but slightly smaller than the opening 11 in the plate 10. Although the fastening element may be driven into the body of the heel, I preferably bore a hole at an angle in keeping with the pitch and rake of the heel, the size or diameter of the hole being slightly smaller than that of the shank portion 32. If desired, at this stage a layer of cement may be applied to the upper surface of the heel to insure the presence of an adequate amount of adhesive when the heel is applied, and before partially embedding the shank of the fastening element in the heel, a daub of cement may be applied to the hole so as to enhance the grip of the fastening element.

Where, as here shown, the opening 11 in the anchor plate extends longitudinally of the shoe, the head 33 of the fastening element preferably extends at right angles, as shown in Fig. 5. Since the shank of the fastening element is merely partially embedded in the heel, the latter may be applied in the manner illustrated in Fig. 6, so that the head 33 of the fastening element projects through the opening 11 of the anchor plate into the recess 14 (Fig. 7) and by turning the heel clockwise through an angle of approximately 90° the head 33 may be locked in place. With the parts thus disposed the heel and fastening elements are permitted sufficient

freedom of movement so that the heel may be accurately positioned or properly seated with its upper edge fitting against the edge of the intumed upper 4, and while thus positioned the entire assembly may either be inserted in a press and subjected to sufficient pressure substantially completely to embed the shank 32 in the body of the heel, or the free end of the heel may be pounded to secure the same result. The fastening element, in conjunction with the anchor plate, is thus effective not only rigidly to secure the heel to the insole structure and upper, but also to hold the parts in proper position during the period required for the cement to become set, after which the shoe may be put through the usual finishing operations.

The anchoring element and associated parts shown in Figs. 8 to 10 are, in principle, similar to that of the previously described embodiment. In this embodiment the anchoring element consists of a concavo-convex plate 40 adapted to fit within the area defined by the intumed edges 4 of the lasted upper. The plate 40 is formed with four transversely extending slits defining a pair of spaced bands 41, which are pressed outwardly to provide, in effect, aligned sockets which receive the end of the shank piece 21a. Between the bands 41 the body of the plate is depressed to provide a recess 42 between the undersurface of the shank piece and the upper surface of the plate. The plate 40 is also provided with a plurality of spaced peripheral prongs 44 which are effective to secure it to the insole structure of a lasted shoe.

The fastening element associated with the plate 40 consists of a U-shaped member 45 having outwardly bent ends folded upon themselves to provide clips 46 engageable with the longitudinal edges of the shank piece 21a between the bands 41. As shown in Fig. 10, the clips 46 have a relatively loose fit, in that their outer edges are spaced from the longitudinal edges of the shank piece so that the entire fastening element may be moved transversely of the plate 40 and shank piece 21a, as well as longitudinally thereof.

In using this particular anchoring element, the shank piece 21a is first assembled therewith and the assemblage is then applied to the insole structure, as in the previously described embodiment. The fastening element may then be applied and also the outsole, together with a layer of cement. A heel having a predrilled hole shaped to receive the free end or shank portion of the fastening element 45, is then applied so that the shank portion is partially embedded therein, after which the heel is accurately positioned and finally subjected to pressure or pounding effective substantially completely to embed the shank portion of the fastening element in the body of the heel. This operation is effective not only to cause the shank portion 45 to be substantially completely embedded in the heel, but also to cause the clips 46 more firmly to grip the longitudinal edges of the shank piece 21.

In the embodiment shown in Figs. 11 to 13, the end of a shank piece 21a provides the anchoring element and accordingly is formed with a raised area 48 which is provided with an elongate opening 49, corresponding to the opening 11 of the plate 10 shown in the previously described embodiment. The end of the shank piece 21b is secured to the insole structure by a clip 50 (Figs. 12 and 13) disposed between a fiber plate 51 and the insole proper 52, the clip 50 having prongs 53 which project through the fiber plate

51 and are clenched about the edges of the shank piece, as shown in Fig. 11. As here shown, the lower edges of the upper 4 are lasted over the fiber plate 51 and are secured in place by lasting tacks 54 and staples 55.

The fastening element associated with the plate consists of a U-shaped member 58 (Fig. 13) having oppositely bent ends defining an elongate head 59 adapted to be inserted through the opening 49 so as to seat in the recess defined by the raised area 48, although if desired the type fastening element shown in Fig. 5 may be used. In using this particular embodiment, the shank portion of the fastening element 58 is partially embedded in the body of the heel to be attached, the procedure being substantially the same as that described in connection with Figs. 2 to 7.

In the embodiment shown in Figs. 14 and 15, the heel portion 65 of the outsole 25 provides, in effect, an anchoring element and to this end it may be trimmed down, as indicated at 66, to provide a heel seat, and an elongate opening 68 is formed approximately in its center. Prior to securing the end 65 to the insole structure, a fastening element, here shown as a headed nail, is applied so that its shank portion 70 projects through the opening 68 with its head 71 positioned between the heel seat and insole structure, it being noted that the size of the opening 68 is sufficient to permit longitudinal and transverse movement of the entire fastening element. After assembling the fastening element, the outsole is secured and a layer of cement is applied. A heel, having a predrilled hole, is next applied, the entire procedure being substantially the same as that described in connection with Figs. 8 to 10.

From the foregoing it will be noted that the attachment of a heel in accordance with the present invention not only eliminates necessity of using a special last, the use of temporary fastening means and the problems resulting from the presence of chips, but also dispenses with the use of expensive machinery and permits the use of long-shanked fastening elements and slow drying adhesives. Furthermore, in a shoe constructed in accordance with the present invention great strength is added to the outsole at the heel breast line, due to the fact that the heel plate is effective to hold the heel firmly in engagement with the heel seat at the breast line, thus eliminating the gap which otherwise might be present or ultimately develop, and the construction not only eliminates distortion of the outsole and the raised rim or area on the insole, but also provides a reinforcement for the entire structure which insures better wearing qualities than otherwise would be possible. As there is also a substantial saving of time, labor and materials, the cost of making shoes is appreciably reduced.

While I have shown and described different desirable embodiments of the invention, it is to be understood that this disclosure is for the purpose of illustration and that various changes in shape, proportion and arrangement of parts, as well as the substitution of equivalent elements for those herein shown and described, may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A shoe comprising an upper, an insole structure, the lower edge of the rear of said upper being intumed about said insole structure, an anchoring element secured to said insole structure, said anchoring element comprising a metal

plate having an elongate central opening, a plurality of circumferentially spaced arms engaging said inturned upper and a plurality of prongs embedded in said insole structure, and a fastening element permanently securing said heel to said anchoring element, said fastening element having a shank portion extending through and loosely fitting the opening in said anchoring element with one end embedded in the body of said heel, the other end of said fastening element being shaped to define an elongate head disposed between the margins surrounding said opening and said insole structure.

2. Means for securing a heel to a shoe, comprising the combination of anchoring and fastening elements, the anchoring element comprising a metal plate having concavo-convex surfaces and adapted to fit against the insole structure and within the area defined by the inturned edges of a lasted shoe upper, said plate having means engageable with said inturned edges and means adapted to be embedded in said insole structure, the fastening element comprising a shank adapted to be embedded in the body portion of a heel, said elements having cooperating interengaging parts constructed and arranged to permit the fastening element to be moved longitudinally and transversely of said anchoring element when in assembled relation therewith.

3. Means for securing a heel to a shoe, comprising the combination of anchoring and fastening elements, the anchoring element comprising a metal plate having concavo-convex surfaces and adapted to fit against the insole structure and within the area defined by the inturned edges of a lasted shoe upper, the fastening element comprising a shank adapted to be embedded in the body portion of a heel, said anchoring element having means for securing it to said insole structure and means engageable with said inturned edges, said elements having cooperating interengaging parts constructed and arranged to permit the fastening element to be moved longitudinally and transversely relative to said anchoring element when in assembled relation therewith.

4. Means for securing a heel to a shoe, comprising the combination with an anchoring plate having a body portion conforming substantially to the heel seat of a shoe and adapted to fit against the insole structure and between the inturned edges of the upper of a lasted shoe and a plurality of circumferentially spaced arms constructed and arranged to engage the marginal portions of said inturned edges, said plate having an elongate opening substantially in the center of its body portion, of a fastening element having a shank adapted to be embedded in the body portion of a heel, and an elongate head having a shape substantially similar to but slightly smaller than the opening in said anchoring element.

5. In the manufacture of shoes, the method

which comprises applying an upper and an insole structure to a last, applying an assembled shank and heel seat plate to the shank and heel portions, respectively, of the insole structure, the heel seat plate having a body portion shaped to fit within the area defined by the inturned margins of the upper and means carried by said body portion and engageable with said inturned margins and having attaching prongs adapted to be embedded in the insole structure, applying pressure to the heel seat plate so as to embed said prongs in the insole structure, thereby permanently uniting the heel seat plate and end portion of the assembled shank with the insole structure, securing to the assemblage an outsole having its rear end trimmed to provide a heel seat, applying a heel to the heel seat, and permanently anchoring the heel to the heel seat plate and insole structure.

6. In the manufacture of shoes, the method which comprises applying an upper and an insole structure to a last, applying an assembled shank and heel seat plate to the shank and heel portions, respectively, of the insole structure, the heel seat plate having a body portion shaped to fit within the area defined by the inturned margins of the upper and having a plurality of circumferentially spaced fingers engageable with the inturned marginal portions of the shoe upper, and attaching prongs adapted to be embedded in the insole structure, applying pressure to the heel seat plate so as to embed said prongs in the insole structure, thereby permanently uniting the heel seat plate and end portion of the assembled shank with the insole structure, securing to the assemblage an outsole having its rear end trimmed to provide a heel seat, applying a heel to the heel seat, and permanently anchoring the heel to the heel seat plate and insole structure.

7. In the manufacture of shoes, the method which comprises applying an upper and an insole structure to a last, applying an assembled shank and heel seat plate to the shank and heel portions, respectively, of the insole structure, the heel seat plate having a body portion shaped to fit within the area defined by the inturned margins of the upper and having a plurality of circumferentially spaced fingers engageable with the inturned marginal portions of the shoe upper, and attaching prongs adapted to be embedded in the insole structure, applying pressure to the heel seat plate so as to embed said prongs in the insole structure, thereby permanently uniting the heel seat plate and end portion of the assembled shank with the insole structure, applying a layer of adhesive to the assemblage, superposing thereon an outsole having its rear end trimmed to provide a heel seat, applying a heel to the heel seat, and permanently anchoring the heel to the heel seat plate and insole structure.

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