

May 19, 1931.

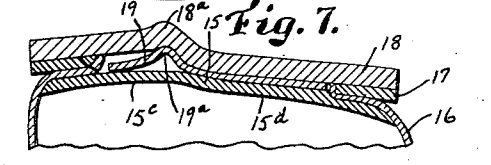
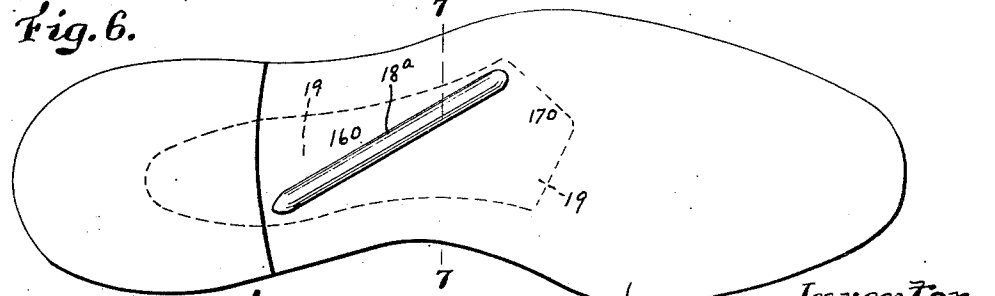
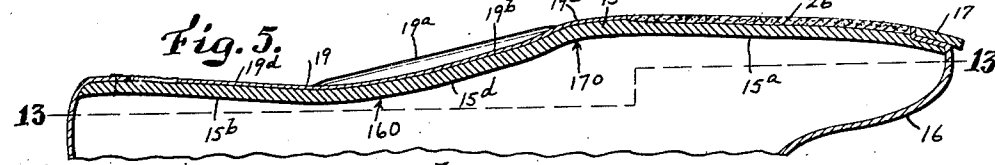
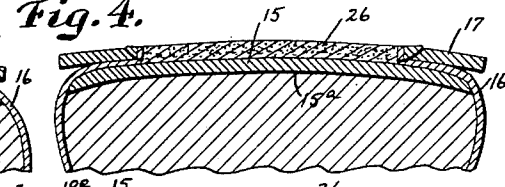
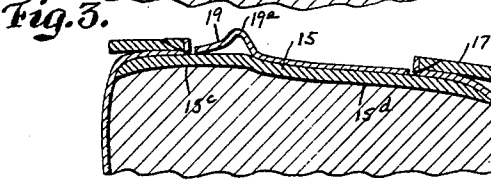
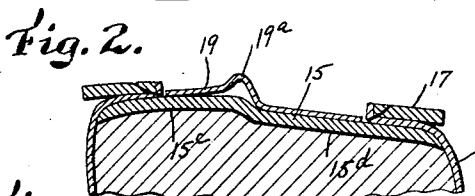
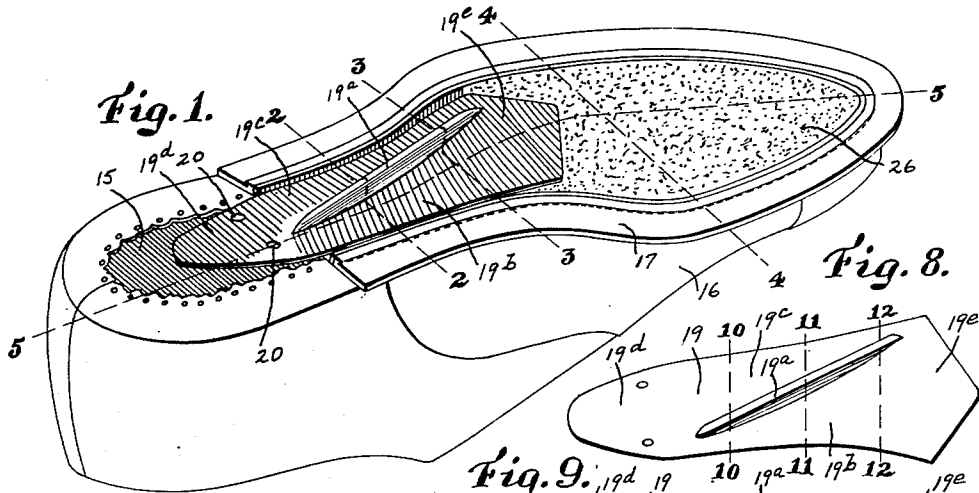
W. H. NICKERSON

1,806,409

ORTHOPEDIC FOOTWEAR

Filed Aug. 7, 1929

2 Sheets-Sheet 1



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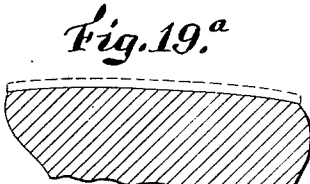
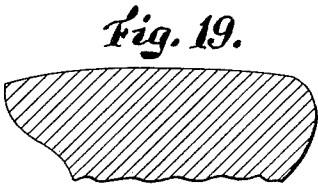
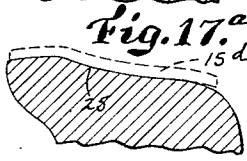
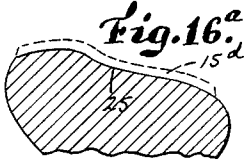
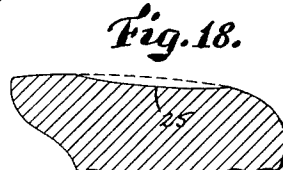
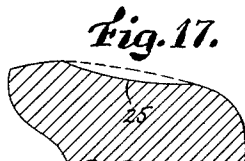
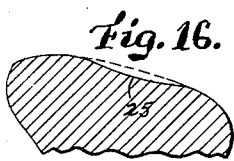
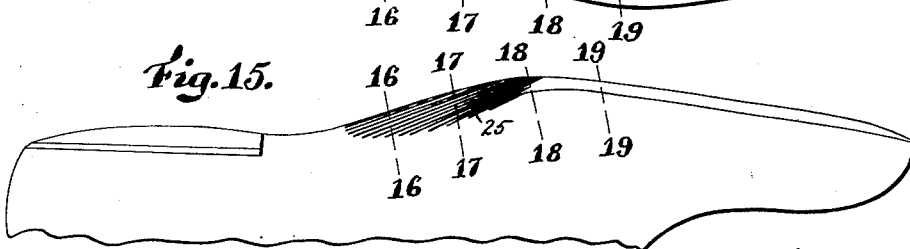
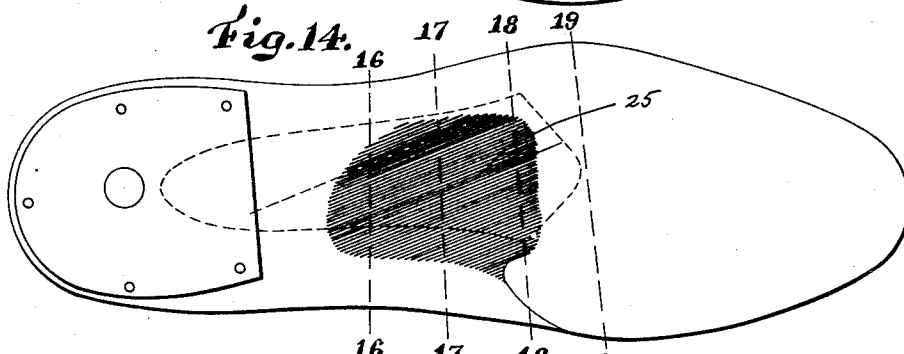
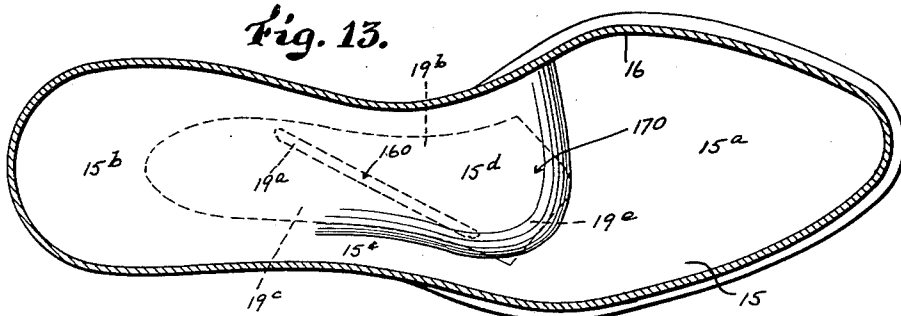
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1,806,409

ORTHOPEDIC FOOTWEAR

Filed Aug. 7, 1929

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

WILLIAM H. NICKERSON, OF NEWTON, MASSACHUSETTS

ORTHOPEDIC FOOTWEAR

Application filed August 7, 1929. Serial No. 384,026.

This invention relates to an orthopedic shoe whose bottom includes an insole, an outsole, and a shank stiffener interposed between the shank portions of said soles.

5 The object of the invention is to provide a shoe bottom, the foot bearing or tread surface of the insole of which is adapted to prevent the deformity of the wearer's foot known as pronation.

10 This object is attained by the improved form of the foot bearing surface of the insole and of the underlying parts hereinafter described.

15 Of the accompanying drawings forming a part of this specification,—

Figure 1 is a perspective view of a lasted shoe minus the outsole.

Figure 2 is a section on line 2—2 of Figure 1.

20 Figure 3 is a section on line 3—3 of Figure 1.

Figure 4 is a section on line 4—4 of Figure 1.

25 Figure 5 is a section on line 5—5 of Figure 1.

Figure 6 is a bottom plan view of the completed shoe.

Figure 7 is a section on line 7—7 of Figure 6.

30 Figure 8 is a side view of the shank stiffener looking toward the outer or under side.

Figure 9 is an edge view of the stiffener.

Figure 10 is a section on line 10—10 of Figure 8.

35 Figure 11 is a section on line 11—11 of Figure 8.

Figure 12 is a section on line 12—12 of Figure 8.

40 Figure 13 is a section on line 13—13 of Figure 5, looking toward the insole.

Figure 14 is a bottom plan view of the last used in making the shoe.

Figure 15 is a side view of a portion of the last.

45 Figures 16, 17, 18 and 19 are sections respectively on lines 16—16, 17—17, 18—18 and 19—19 of Figures 14 and 15.

50 Figures 16*a*, 17*a*, 18*a* and 19*a* are views similar to Figures 16, 17, 18 and 19, showing the insole by dotted lines.

The same reference characters indicate the same parts in all of the figures.

The shoe shown by the drawings is a welt shoe and includes an insole designated by 15 with exponents, an upper 16, a welt 17, the 55 upper and welt being lasted on a last whose bottom surface is shaped to impart to the shoe bottom the form hereinafter described in accordance with the invention, an outsole 18, and a shank stiffener designated by 19 60 with exponents, interposed between the shank portions of said soles.

The foot bearing or tread surface of the insole includes a normal fore portion 15*a* (Figure 13), a normal heel portion 15*b*, a 65 narrow normal outer edge portion 15*c* extending between and merging into the normal heel and fore portions. Said portions are called normal because the portions 15*a* and 15*b* conform to the fore and heel portions 70 of a normal foot bottom, and the portion 15*c* conforms to the outer side portion of a normal foot bottom.

In accordance with my invention I provide the foot bearing surface with a raised 75 modified portion 15*d*, rising somewhat abruptly from the normal fore portion 15*a* and from the normal outer edge portion 15*c*, merging into the normal heel portion 15*b*, and extending transversely from the outer 80 edge portion 15*c* to the inner edge of the insole, as shown by Figure 13, said inner edge being therefore raised above the outer edge portion 15*c*. The form of the shank stiffener 85 is such that the modified portion 15*d* is supported or maintained in its raised form by the stiffener. The area and location of the modified portion 15*d* are such that said portion underlies the keystone bones of the foot 90 which coact to support the weight of the body. Said bones, as is well known, include the first and second metatarsals, the cuneiform, and the various joints of the cuboid region. The point in the modified portion 15*d* 95 designated by 160 (Figure 13) is located under the central portion of the group of keystone bones. The point designated by 170 (Figures 5, 6 and 13) is located under the central portion of the metatarsal arch.

The arrangement is such that the normal 100

portions 15a, 15b and 15c, and the modified portion 15d cooperate in supporting the foot bottom in such manner as to prevent pronation of a normal foot.

5 The shank stiffener includes an obliquely extending stiffening ridge 19a, projecting from the under side of the stiffener, a longitudinally curved inner wing portion or flange 19b, adjacent the inner edge of the insole
10 shank, a longitudinally curved outer wing portion or flange 19c, adjacent the outer edge of said shank, a flat rear end portion 19d, secured by fasteners 20 to the insole, and a curved forward end portion 19e, formed to
15 constitute a slightly concave support for the foot-bearing portion 170 (Fig. 5) under the metatarsal arch.

The oblique arrangement of the ridge 19a locates the said length portion thereof directly under the foot-bearing portion 160, to
20 rigidly support the latter. The forward end of the ridge is spaced laterally from the foot-bearing portion 170, as indicated by dotted lines in Figure 13, so that a considerable area
25 of the modified portion 15d, including the portion 170, bears on the inner wing portion 19b and the forward end portion 19e, and is rigidly backed thereby, the said wing and end portions being stiffened by the ridge. The
30 inner wing portion 19b is approximately triangular and is widest at its forward end which is the only portion of the stiffener located under the metatarsal region indicated by 170.

35 The portion of the shank stiffener designated by 19b and 19e forms a normal fore portion, the portion designated by 19d forms a normal heel portion, and the portion 19c forms a narrow normal outer edge portion extending between and merging into the normal
40 fore and heel portions. The obliquely extending stiffening ridge forms a modified stiffener portion adapted to underlie the group of keystone bones. Said ridge is inclined
45 upward from the normal fore and outer edge portions, merges into the normal heel and fore portions, and extends transversely from the outer edge portion to the inner edge portion of the stiffener, so that it defines one edge
50 of an approximately triangular inner wing having a relatively wide forward end formed to constitute a slightly concave portion adapted to underlie the metatarsal arch.

The shank of the outsole 18 is molded preferably by a molding operation preceding the
55 attachment of the outsole to the welt to form thereon an obliquely extending ridge 18a (Figures 6 and 7), conforming to the stiffener ridge 19a. The operation of attaching the
30 outsole to the welt, and the subsequent operation of leveling the shoe bottom by a leveling machine acting on the outsole, causes the close conformation illustrated by Figures 6 and 7, of the outsole to the stiffener, and to the
35 insole.

The bottom of the last on which the shoe is formed, is shaped to conform closely to the normal and modified foot-supporting portions of the insole, as indicated by Figures 14 to 19, said bottom having in its shank portion
70 a shallow recess 25, which forms the modified portion 15d of the insole, as indicated by dotted lines in Figures 16a, 17a and 18a. Said recess merges into the usual normal surfaces of the last bottom and disappears
75 at the ball portion of the last bottom as indicated by Figures 14, 15 and 19.

The usual layer of bottom filler is designated by 26, said layer extending to the forward end of the shank stiffener, as shown by
80 Figure 1.

I claim:

1. An orthopedic shoe comprising an insole, an outsole, and a shank stiffener located between the shank portions of said soles, the
85 foot bearing surface of the insole including a normal fore portion, a normal heel portion, a narrow normal outer edge portion extending between and merging into the normal fore and heel portions, and a raised modified
90 portion underlying the group of keystone bones and the metatarsal arch of the foot, said modified portion being inclined upward crosswise of the insole from the normal outer edge portion to the inner edge of the insole,
95 and inclined upward lengthwise of the insole from the normal fore portion to the normal heel portion, the shank stiffener being formed to support the portions of the insole, which include the narrow normal outer edge
100 portion, and the modified raised portion, said stiffener having a stiffening rib extending obliquely from the inner edge of the stiffener near the heel end, to a point near the outer edge of the forward end, and underlying
105 the group of keystone bones, the forward end of the stiffener being widened to provide an approximately triangular inner wing at one side of the rib.

2. An orthopedic shoe as specified in claim 1, in which said wing is formed to constitute a slightly concave support adapted to underlie the portion of the insole under the metatarsal arch.

In testimony whereof I have affixed my signature.
115

WILLIAM H. NICKERSON.

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