P. F. W. C. KRIPPENDORF.

SHOE.

APPLICATION FILED JULY 7, 1916.

1,255,893. Patented Feb. 12, 1918.

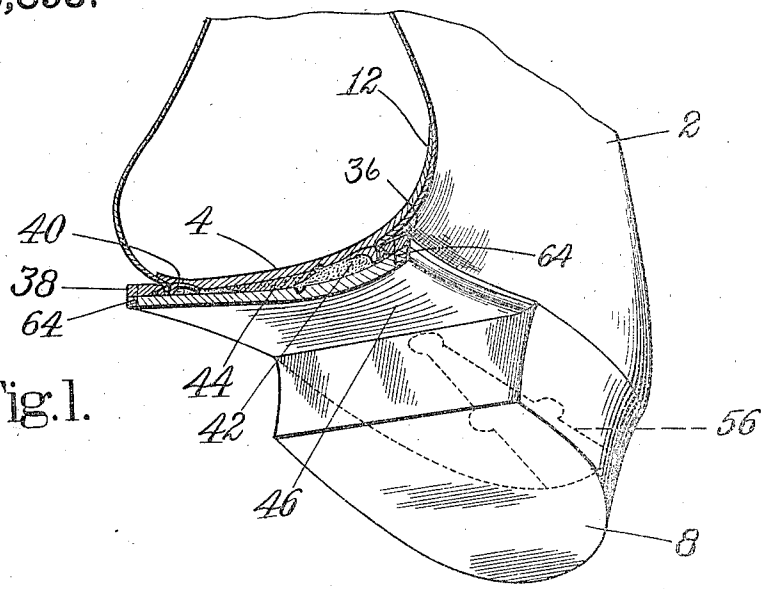
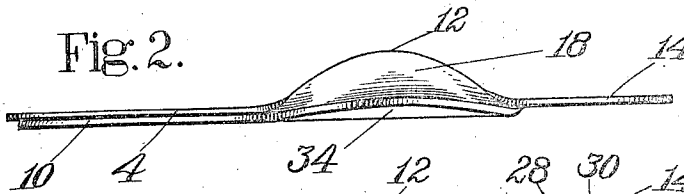


Fig. 1.

Fig. 2.



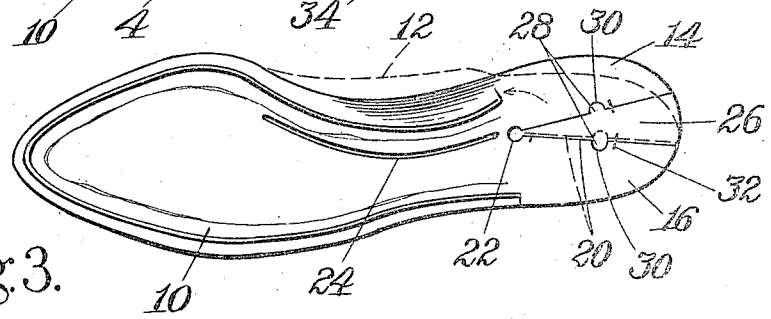


Fig. 3.

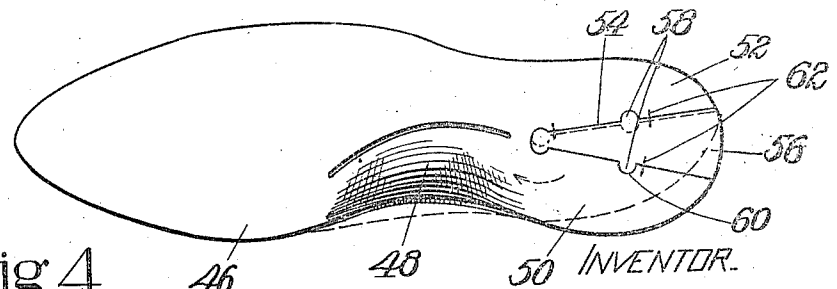


Fig. 4.

INVENTOR.

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UNITED STATES PATENT OFFICE.

PAUL F. W. C. KRIPPENDORF, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SHOE.

1,255,893. Specification of Letters Patent. Patented Feb. 12, 1918.

Application filed July 7, 1916. Serial No. 107,965.

To all whom it may concern:

Be it known that I, PAUL F. W. C. KRIPPENDORF, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain Improvements in Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to shoes and is herein illustrated as embodied in a shoe of the welt type although it will be understood that the invention can also be embodied to advantage in shoes of other types.

In the present standard ready-made shoes practically no attempt is made to provide for the arched formation of the shank portion of the foot and particularly for the transverse arch of the foot. Consequently these shoes, by failure to provide uniform support throughout the shank portion of the foot, cause a more or less unnatural development and unbalanced muscular condition of the foot since the normal strain on the various muscles of the foot which should be distributed over a large portion of the foot, is concentrated on a relatively small part of the foot, and, in many instances, such shoes are directly responsible for "broken arches" and other foot maladies. Many expedients have been adopted for the purpose of correcting this defect, the most common being to incorporate in the shoes mechanical appliances or artificial supports such as metal plates. These corrective supports, however, have in general proved unsatisfactory and only increase the cost of the shoe and add unnecessary weight to the shoe. Moreover, arch supports render shoes exceedingly stiff and inflexible and often restrict the normal functions of the various foot muscles in such manner as to make the wearing of the supports permanently necessary instead of acting after a short temporary use thereof to relieve the strained condition of the feet sufficiently to permit normal development of the foot muscles and any further wear of the support unnecessary.

The present invention aims to provide an improved shoe which will conform more accurately to the anatomical structure of the foot and offer better support for the shank portion of the foot than ready-made shoes as heretofore constructed while, at the same time, allowing for the natural and proper development of the muscles of the foot; and which, furthermore, can be produced without materially increasing the cost of the shoe or detracting from its appearance.

With these objects in view the present invention, in one of its aspects, comprises a novel shoe sole characterized by a shank portion which is so formed as to correspond substantially to the arched conformation of the shank portion of the foot and which is treated to maintain permanently the conformed condition of the sole. In the illustrated embodiment of the invention, the desired arch of the sole in the shank is produced by buckling the shank portion of the sole upwardly and locking the buckled portion of the sole in such manner as to allow considerable flexibility of the shoe in the shank whereby the natural development of the foot muscles are not restricted while at the same time adequate and uniform support is provided throughout the entire shank portion of the foot.

In another of its aspects, the present invention contemplates providing a novel shoe in which the shank portion of the sole of the shoe is formed to correspond substantially to the arched conformation of the foot and the shoe upper is cut in accordance with the particular formation of the sole to assist the sole in supporting the foot and to obtain a close fitting shank for the shoe.

Other objects and features of the invention will be apparent when the following description and claims are considered in connection with the accompanying drawings in which,—

Figure 1 is a perspective view of the heel portion of a shoe constructed in accordance with the present invention;

Fig. 2 is a side elevation of the insole;

Fig. 3 is an inverted plan view of the insole; and

Fig. 4 is a plan view of the outsole.

The preferred method of making one form of the shoe constituting the present invention is disclosed and fully described in my co-pending application Serial No. 102,447, filed June 8, 1916.

Referring to the drawings the shoe illustrated is of the welt type and comprises an upper 2, an insole 4, an outsole 46 and a heel 8. The last upon which the shoe is made is similar to an ordinary commercial

last except that the shank portion of the last is somewhat deeper particularly at the inside shank and corresponds more closely to the contour of a normal foot.

The insole 4 may be of the type ordinarily used in making a Goodyear welt shoe and is therefore, provided with the usual stitch receiving channel 10 on its under face, the channel extending from the heel breast line at one side of the insole, about the forepart thereof, and terminating at the heel breast line at the opposite side of the insole. Preferably, also the insole is provided with an additional area of stock 12 along its inside shank for the purpose of offering greater support to the inside shank portion of the foot when the insole is incorporated in the shoe and also reducing the tendency of the foot to roll inwardly in the shoe.

In accordance with the present invention the shank portion of the insole 4 is conformed to the lateral and transverse conformation of the shank portion of the foot and, as herein shown, this is accomplished by buckling the stock in the shank portion of the insole upwardly to form an arch corresponding substantially to the arched conformation of the shank portion of the foot it is to support. The illustrated preferred manner of buckling the stock in the shank of the insole is to separate the heel end of the insole into inside and outside portions 14 and 16, respectively, and displacing or offsetting the inside portion 14 laterally in the direction of the arrow, Fig. 3, into such position as will create a fullness of stock along the inside shank portion of the insole and form an arch 18 of such curvature as to correspond to the arch of the foot it is desired to support. Preferably the heel end of the sole is separated by a "buttonhole" cut 20 which extends approximately centrally of the heel end of the insole from the heel breast line to its rear edge. The amount of fullness created in the shank portion of the insole and the formation of the arch 18 depends to a large extent upon the location of this cut and it has been found in practice to be preferable to locate the perforation 22 of the cut approximately central of either side of the insole at the breast line in which event the outside shank portion of the insole is not affected by the buckling of the material at the inside shank thereby providing a substantially level surface for the outside shank portion of the foot. In order to confine the buckled portion 18 of the insole to the inside shank and to cause the stock to arch progressively from the substantially flat outside shank portion of the insole, it has been found advantageous to score the under side of the insole as indicated at 24. The buckled portion 18 of the insole is preferably maintained in its conformed condition by a V-shaped locking wedge 26 located between the inside and the outside portions 14 and 16 of the heel end of the insole 4, the locking member 26 being of sufficient size and shape as to prevent the inside portion 14 and the buckled portion of the sole from returning to its normal position. This wedge 26 is held in position between the inside and outside portions 14 and 16 by offsets 28 projecting into coöperating notches 30 in the inside and outside portions of the insole. Staples 32 may also be inserted as indicated in Fig. 3. In consequence of this construction it will be noted that the arch 18 provided in the shank of the insole is substantially the same as the arched conformation of the foot, that is, the arch of the insole is progressively curved upwardly from the outside shank to the inside shank so as to conform to the transverse conformation of the foot and at the same time a longitudinally disposed arched formation 34 (see Fig. 2) is also created which formation increases progressively in height from the outside shank to the inside shank as does the corresponding formation of the foot. Also it will be noted that the arch 18 of the insole is permanently locked or maintained in arched position entirely independently of any means coöperating directly with the arched portion of the insole whereby it is entirely free to yield and conform itself to the movements and changes of the arched conformation of the shank of the foot during wear.

The upper 2 may be cut substantially the same as the ordinary upper except that the portion 36 of the upper along the inside shank where it is secured to the arched portion 18 of the insole is cut away to compensate for the arch 18 and to enable the upper to be drawn in close at the shank and to provide additional support for the inside shank portion of the foot. The upper 2 and a welt 38 are secured to the insole 4 by stitches 40 received in the channel 10 in the usual manner. The shoe is provided with the usual filler 42 and if desired a shank piece 44 may also be utilized although the peculiar arched formation 18 of the insole in the shank will ordinarily be found sufficient to maintain the longitudinal curvature of the shoe in the shank.

The outsole blank 46 of the shoe is of the usual construction and is also buckled along its inside shank in a similar manner to the insole to provide an arch 48 which will conform to the arch 18 of the insole and operate to reinforce said arch. The buckled portion 48 of the outsole is preferably produced in the same manner as that of the insole by separating the heel end of the outsole into inside and outside members 50 and 52, respectively, by a buttonhole cut 54 extending from approximately the heel breast line of

the outsole to its rear edge. Preferably this cut 54 is located in substantially the same relative position as the cut 20 of the insole 4 whereby the arched formation 48 provided in the shank portion of the outsole 46 has similar proportions to the arched formation 18 of the insole. The position of the inside member 50 of the outsole, after the desired amount of buckling has been obtained in the shank, is maintained by a similar wedge-shaped locking member 56 located between the offset portion 50 and the outside portion 52 of the sole 46, the locking member being retained in position by offsets 58 interlocking with notches 60 in the inside and outside portions and by staples 62 as in the insole 4. By forming an arch 48 in the shank of the outsole 46 adapted to fit in under the arch 18 of the insole it will be seen that the insole is reinforced and the strain on the upper securing stitches caused by the flexing of the shoe during wear is relieved. Also it will be noted that by locking both the insole and outsole in their conformed condition there is no tendency of the soles to return to their normal condition thus relieving the strain of the upper materials across the instep of the foot. The outsole 46 is secured to the welt by stitches 64 and the heel 8 attached to the shoe in the usual manner, the heel 8 covering the portion of the outsole 46 which is split as shown in Fig. 1. Preferably the arched portion 48 of the outsole 46 is confined entirely to the shank portion thereof so that a substantially level heel seat is provided to receive the heel.

A shoe constructed in the manner above described conforms to the anatomical structure of the foot throughout both the longitudinal and transverse curvatures of the foot in the shank so that the weight of the body is distributed uniformly over those parts of the foot that are designed to sustain this weight. Moreover, the shoes are exceedingly flexible and maintain a proper disposition of the foot in the shoe so that the normal functions of the various muscles of the foot are not interfered with. It will be noted further that a shoe constructed in this manner is especially adapted to correct the abnormalities of the foot and restore the foot to its normal condition without rendering the shoe uncomfortable until such abnormalities have been corrected. Where attempts have heretofore been made to provide a shoe conforming to the anatomical structure of the foot it has been necessary in most instances to have such shoes made by orthopedic specialists and the cost of the shoes, therefore, placed them out of reach of the majority of people. It will be noted, however, that the shoe of the present invention can be manufactured without substantial changes from the method used in the production of standard ready-made shoes and without materially increasing the cost of such shoes.

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

1. A shoe comprising a sole having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot and locked in its arched position, and an upper cut away along its inside portion adjacent to the shank to compensate for the arch of the sole and being secured to said sole.

2. A shoe comprising a sole having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot and locked in its arched position, and an upper secured to said sole.

3. A shoe comprising a sole having its shank portion buckled to form an arch corresponding substantially to the longitudinal and transverse conformation of the shank portion of the foot and treated to maintain permanently the arched conformation of the sole, and an upper secured to said sole.

4. A shoe comprising a sole the shank portion of which is buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot, means cooperating with portions of the sole other than the shank for maintaining the shank portion of the sole in its conformed condition, an upper, and means for securing the upper to the sole.

5. A shoe comprising an insole the shank portion of which is buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot and locked in its arched position, an upper secured to said insole, and an outsole attached to the shoe, said outsole also having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of said insole.

6. A shoe comprising an insole the shank portion of which is buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot, an upper secured to said insole, and an outsole attached to the shoe, said outsole also having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of said insole and permanently locked in its arched position.

7. A shoe comprising a sole having a portion of its heel end displaced laterally to form an arched formation of the sole in the shank corresponding substantially to the arched formation of the shank portion of the foot and having the displaced portion of the sole secured in said position relatively to other portions of the sole, and an upper attached to said sole.

8. A shoe comprising an insole having a

portion of its heel end displaced laterally to form an arched formation of the sole in the shank corresponding substantially to the arched conformation of the shank portion of the foot and having the displaced portion of the sole secured in said position relatively to other portions of the sole, an upper attached to the sole, an outsole secured to the shoe, said outsole also having a portion of its heel end displaced laterally to form an arched formation of the sole in the shank corresponding substantially to the arched conformation of the insole and having the displaced portion of the sole secured in said position relatively to other portions of the sole, and a heel attached to the shoe.

9. A shoe comprising a sole the heel end of which is separated from approximately the heel breast line to its rear edge into inside and outside portions, the inside portion of said sole being displaced laterally to form an arched formation of the sole in the shank corresponding substantially to the arched conformation of the foot and having the displaced portion of the sole secured relatively to the outside portion whereby the shank portion of the sole is maintained in its arched position, and an upper attached to the shoe.

10. A shoe comprising an insole having its heel end separated from approximately its heel breast line to its rear edge into inside and outside portions, said inside portion being offset laterally to form an arched formation of the sole in the shank corresponding substantially to the arched conformation of the foot and secured in its offset position relatively to the outside portion whereby the shank portion of the sole is maintained in its arched position, an upper secured to said insole, an outsole secured to the shoe, said outsole also having its heel end separated from approximately the heel breast line to its rear edge into inside and outside portions and having its inside portion offset laterally to form an arched formation in the shank of said outsole corresponding substantially to the arched conformation in the shank of said insole and secured in its offset position, and a heel attached to the shoe.

11. A shoe comprising a sole having its heel end separated from approximately its heel breast line to its rear edge into inside and outside portions, said inside portion being offset laterally to form an arched formation of the sole in the shank corresponding substantially to the arched formation of the foot and maintained in such position by a locking member located between the offset and outside portions of the heel end of the sole, an upper, and means for securing the upper to the sole.

12. A shoe comprising an insole having its heel end separated from approximately its heel breast line to its rear edge into inside and outside portions, said inside portion being offset laterally to form an arched formation of the insole in the shank corresponding substantially to the arched formation of the foot and maintained in such position by a locking member located between the offset and the outside portions of the heel end of the insole, an upper secured to the insole, an outsole secured to the shoe, said outsole also having its heel end separated from approximately the heel breast line to its rear edge into inside and outside portions and having its inside portion offset laterally to form an arched formation corresponding substantially to the arched formation of the insole in the shank and maintained in such position by a locking member located between the offset and the outside portions of the heel end of said outsole, and a heel attached to the shoe.

13. A shoe comprising an insole provided with upper securing means and having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot and locked in its arched condition, an upper and a welt secured to the insole by the upper securing means, an outsole secured to said welt, the shank portion of said outsole being also buckled upwardly to form an arch corresponding substantially to the arched conformation of the insole and locked in its arched condition, and a heel attached to the shoe.

14. A shoe comprising an insole provided with upper securing means and having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot and locked in its arched condition, said insole having an additional area of stock along its inside shank portion adapted to extend up the side of the shoe, a welt and an upper secured to the insole by the upper securing means, an outsole secured to said welt, the outsole also being buckled upwardly to form an arch corresponding substantially to the arched formation of the sole and locked in its arched condition, and a heel attached to the shoe.

15. As an article of manufacture, a sole for shoes having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot and locked in its arched position.

16. As an article of manufacture, a sole for shoes having its shank portion buckled to correspond substantially to the longitudinal and transverse conformation of the shank portion of the foot and treated to maintain permanently the arched condition of the sole.

17. As an article of manufacture, a sole for shoes having its shank portion conformed

to correspond substantially to the longitudinal and transverse conformation of the shank portion of the foot, and means cooperating with portions of the sole other than the shank for maintaining the shank portion of the sole in its conformed condition.

18. As an article of manufacture, a sole for shoes having a portion of its heel end displaced laterally to form an arched formation of the sole in the shank corresponding substantially to the arched conformation of the shank portion of the foot and having the displaced portion of the sole secured in said displaced position.

19. As an article of manufacture, a sole for shoes having its heel end separated from approximately the heel breast line to its rear edge into inside and outside portions, the inside portion of the sole being displaced laterally to form an arched formation of the sole in the shank corresponding substantially to the arched conformation of the foot, and having a locking member located between the inside and outside portions of the heel end of the sole to maintain the conformed condition of the shank portion of the sole.

20. In a shoe, an insole provided with upper securing means on its under face and having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of the shank portion of the foot and having its arched conformation maintained in such condition by means coöperating with portions of the sole other than the conformed shank portion.

21. In a shoe, an insole having its shank portion buckled upwardly to form an arch corresponding substantially to the arched conformation of the foot and having its arched formation maintained in such condition by other portions of the sole.

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

PAUL F. W. C. KRIPPENDORF.