June 7, 1938. A. MACDONALD 2,120,055

OS CALCIS SUPPORT

Original Filed Jan. 22, 1936

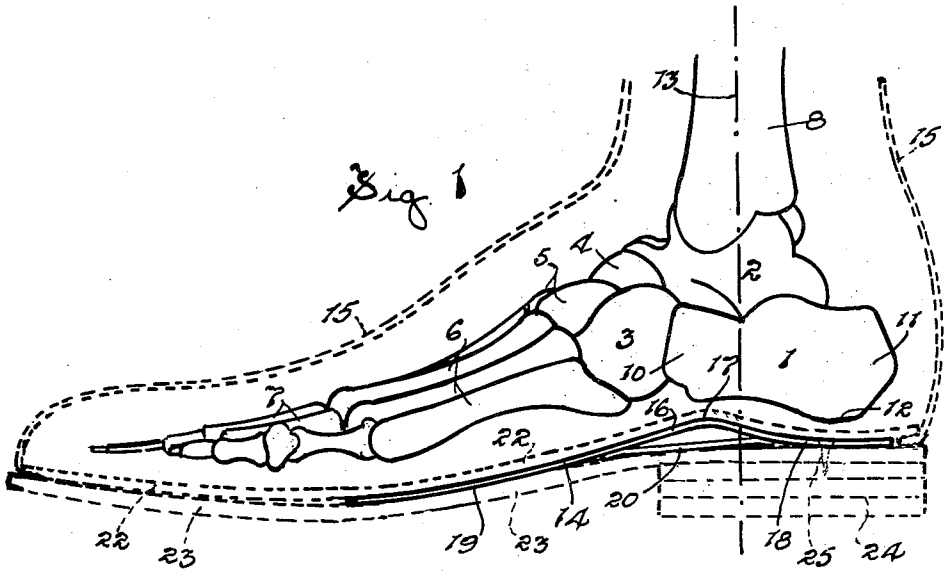


Fig. 1

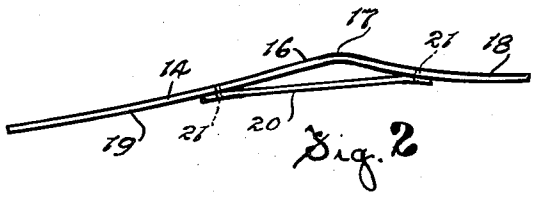


Fig. 2

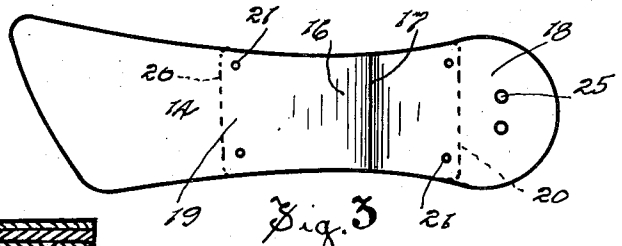


Fig. 3

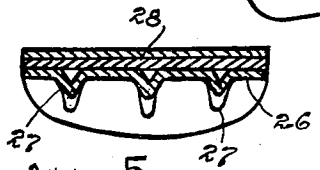


Fig. 5

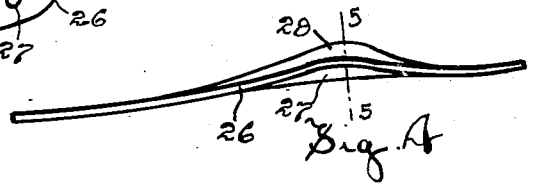


Fig. 4

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Patented June 7, 1938 2,120,055

UNITED STATES PATENT OFFICE

2,120,055

OS CALCIS SUPPORT

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Application January 22, 1936, Serial No. 60,280
Renewed January 10, 1938

3 Claims. (Cl. 36—71)

The invention relates to a support located in a boot or shoe and so designed that it effectively supports in the normal position the fore or anterior portion of the os calcis or heel bone of the inserted human foot and by so doing causes the greater part of the weight of the body to be distributed rearwardly over the heel portion of the shoe and relieves the forepart of the foot from undue weight which so often results in various undesirable foot ailments.

I am fully aware that supports of many and various types have heretofore been provided for supporting the normal arches of the foot and for correcting the various deformities and irregularities which exist, but I do not know of any support which has heretofore been made, with an elevated portion located so that it underlies the forward or anterior end of the os calcis or heel bone and prevents the same from dropping from its normal elevated position under the superimposed load of the body weight and accordingly maintains the greater portion of the body weight distributed over the heel of the shoe.

Referring to the accompanying drawing,—

Fig. 1 is a side view of the bones of the human foot and showing my support thereunder, with the shoe containing the foot and support appearing in dotted outline.

Fig. 2 is a side view of the support removed from the shoe.

Fig. 3 is a plan view of the support.

Fig. 4 is a side view of a modified form of the support.

Fig. 5 is an enlarged cross sectional view at 5—5 Fig. 4.

In the drawing like characters of reference indicate corresponding parts in the several figures.

The human foot, as illustrated in Fig. 1 of the drawing, presents a number of major bones including the os calcis or heel bone 1, the astragalus 2 thereabove, the cuboid 3 in advance of the os calcis, the scaphoid 4 in advance of the forward end of the astragalus, the cuneiforms 5 in advance of the scaphoid and the metatarsals 6 and phalanges 7. The weight of the body is transfered through the tibia 8 to the astragalus 2 and through the latter is distributed through the various other foot bones to the ground or other support.

The applied weight of the body, in the course of time, has a natural tendency to break down the longitudinal arches of the foot and this results in the various foot troubles or ailments to which the human foot is subjected.

It will be observed that in the natural foot, the os calcis or heel bone 1 has an inclined position, the fore or anterior part 10 being elevated and the rear part 11 presenting an under lobe 12 for contact with the supporting surface. It will also be noted that the lobe 12 is considerably to the rear of the dotted vertical line 13 passing centrally through the tibia 8. This means that the applied weight of the body has a constant tendency to force the anterior end of the heel bone downwardly from its natural elevated position and if such occurs the body weight is not properly distributed through the foot and foot troubles develop. Any dropping of the forward end of the heel bone has obviously a natural tendency to throw a greater proportion of the body weight ahead and such unnatural weight distribution condition is in my opinion the cause of most foot ailments.

In order to positively prevent any dropping of the forward or anterior end of the heel bone, I have provided a support 14 to be placed in the boot or shoe 15 and so designed that when located in proper position in relation to the inserted foot, it provides an elevated portion 16 the peak 17 of which directly underlies the forward or anterior end of the heel bone in the natural elevated position of the latter and acts to positively prevent the dropping of the front end of the heel bone from its natural position.

The support can be formed from a stiff metal plate, transversely flat, and of a length to reach from the rear part of the heel portion of the shoe to the front ends of the metatarsal bones of the foot, and having the rear part 18 thereof inclining rearwardly and downwardly from the peak 17 to follow the contour of the underside of the foot heel and the forward part 19 thereof inclining forwardly and downwardly to follow the contour of the longitudinal arches of the foot.

The plate can be reinforced against buckling in several ways such as by using a tie or brace strap 20 underlying and crossing the upwardly arched portion of the plate and having the ends thereof permanently secured to the plate as by rivets 21.

The support can be placed in the boot or shoe between the insole 22 and the outsole 23 and can be tacked, nailed or screwed to the shoe heel 24 and as indicated at 25.

In Figs. 4 and 5 of the drawing I have shown a modification of the support structure. In these views the metal plate 26 is the shape of the ordinary arch support one finds in shoes now on the market, the plate being reinforced by longitudinal ribs 27 provided for the purpose. In this type of plate the rear heel portion is substantially hori-

zontal, although slightly dished, and in no way serves to support the forward or anterior part of the heel bone in its normal elevated position. By shaping and applying leather or such like wedges **28**, and cementing them to the plate **26** I can build up the plate so that it presents an upper contour identical to that of the plate previously described and by so doing provide a support which will function to accomplish the desirable object hereinbefore set forth.

The plate shown in Figs. 1, 2 and 3 can be reinforced by longitudinal ribs such as shown in Figs. 4 and 5 if such be desired.

From the foregoing it will be apparent that my support will retain the heel bone in its natural position and by so doing will insure that the weight of the body will be distributed through the foot to the ground in the normal manner, that is with the greater part of the body weight transferred through the heel and the forepart of the foot relieved of abnormal strains which result in foot ailments.

What I claim as my invention is:—

1. An insole for a boot or shoe having its front and rear ends oppositely inclined to underlie, respectively, the longitudinal arches and the heel bone of the wearer's foot and meeting in an elevated transverse ridge positioned directly under and directly supporting the anterior portion of the heel bone.

2. An os calcis support for a boot or shoe comprising a continuous plate having the front and rear portions thereof oppositely inclined to underlie, respectively, the longitudinal arches and the os calcis of the wearer's foot and meeting in a peak positioned directly underneath and directly supporting the anterior portion of the os calcis.

3. An os calcis support for a boot or a shoe comprising a continuous plate having the front and rear portions thereof oppositely inclined to underlie, respectively, the longitudinal arches and the os calcis of the wearer's foot and meeting in a peak positioned directly underneath and directly supporting the anterior portion of the os calcis, and means for reinforcing the peaked part of the plate.

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