No. 730,545. PATENTED JUNE 9, 1903.

F. B. LEE.

ELECTRIC FOOT ARCH SUPPORTER.

APPLICATION FILED DEC. 30, 1902.

NO MODEL.

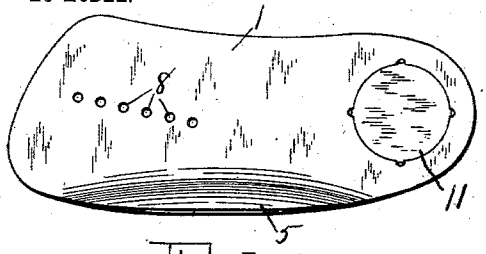


Fig. I.

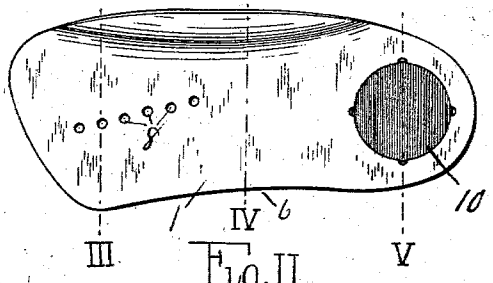


Fig. II.

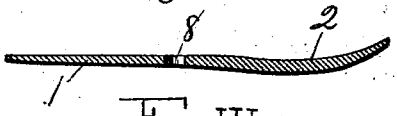


Fig. III.

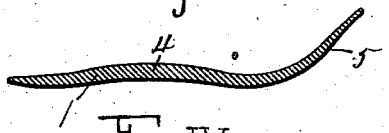


Fig. IV.

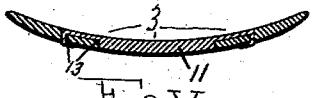


Fig. V.

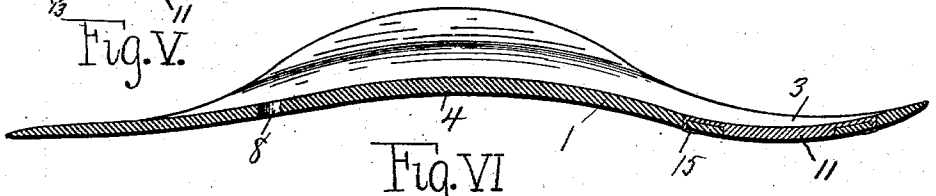


Fig. VI

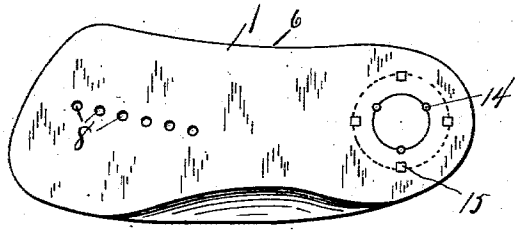


Fig. IX.

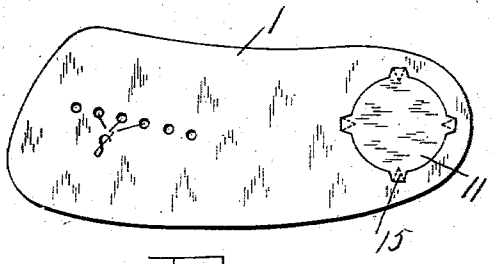


Fig. VII.

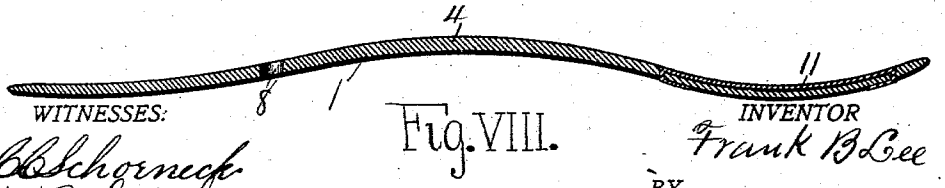


Fig. VIII.

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No. 730,545. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

FRANK B. LEE, OF BUFFALO, NEW YORK.

ELECTRIC FOOT-ARCH SUPPORTER.

SPECIFICATION forming part of Letters Patent No. 730,545, dated June 9, 1903.

Application filed December 30, 1902. Serial No. 137,093. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. LEE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Electric Foot-Arch Supporters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an electric arch-supporter for the foot, and has for its object to provide a firm but slightly elastic arch-supporter, easily shaped to the contour of the particular foot, by which the instep-arch may be well supported without interfering with the action of the toes and currents of electricity generated by voltaic action to stimulate the body and eliminate uric acid, cure rheumatic pains, and for other desirable effects.

To this end my invention consists of a pair of aluminium arch-supporters to fit the right and left foot substantially three-quarters of the length of the foot and terminating just in front of the ball of the foot in an inclined end, so that the toes are not impeded. The supporter for one foot is provided in the heel with a plate of copper and for the other foot with a plate of zinc, both plates giving large surfaces of contact with the heel, whereby currents of electricity are generated by the chemical action of the perspiration of the foot on the respective plates.

My invention will be understood by reference to the drawings herewith, in which the reference-numerals of the specification indicate the corresponding parts in all the figures.

Figures I and II are top plans, respectively, of the arch-supporter for the right and left foot. Figs. III, IV, and V are respectively cross-sections, enlarged, on lines III, IV, and V of Fig. II. Fig. VI is a longitudinal section. Figs. VII and VIII are respectively a top plan and an enlarged longitudinal section showing a variation in the heel-plate. Fig. IX is an inverted plan of Fig. II.

In the figures, 1 indicates the arch-supporter, formed with a suitable concavity 2 to fit the ball, and a corresponding concavity 3 to fit the heel the supporter at these points being substantially of the same thickness, so that the foot is evenly supported.

At 4 the supporter is made thicker and stronger and elevated to support the arch, being curved up inwardly at 5 and slightly cut out at 6 on the outer edge. It terminates just in front of the ball in the inclined and slightly-curved front edge, preferably beveled to avoid an uncomfortable thick edge or ridge and is provided with vent-holes 8 in the front portion or elsewhere, if desired. The whole margin is preferably beveled like the front edge, though it is not so important at the cut-out 6.

In the heel portion of each supporter is formed a cavity to receive a metallic plate, preferably circular, giving rather a large surface of contact with the heel of the wearer. In the supporter for one foot the plate 10 is of copper and in the other 11 of zinc, and they are secured in position by any suitable means, preferably by countersinking at 13 the cavity in the supporter and correspondingly forming the plate of equal thickness, which is swaged or pressed to be retained firmly in position. Metallic plugs or rivets 14 of the same material as the plate may be used, if desired, and hooks or lugs 15 integral with the upper portion of the plate and engaging with the metal of the supporter. In Figs. VII and VIII, I have shown a variation in the construction and arrangement of the plate in which the cavity does not extend entirely through the supporter, but is merely a depression to which each plate is snugly fitted and retained in position by the hooks or lugs 15.

By this construction I have produced a foot-supporter which has the combined advantages of firmly supporting the arch and of generating slight voltaic currents, which have a beneficial effect on the whole body and particularly on pains of a rheumatic nature in the foot and legs. The zinc and copper plates form a voltaic couple and produce a difference of potential when moistened by the saline or acidulated perspiration, the copper being positive and the zinc negative.

Aluminium is important because sufficiently firm to give a good support to the foot and yet having a very slight elasticity, therefore not too hard and unyielding, so that the

supporters from their material and form may be worn with great comfort, scarcely being noticeable to the wearer. They may be bent, fitted, and formed to fit any foot, such as deformed feet, by pincers, &c., without the use of expensive plaster casts and without mechanical adjusting appliances combined with the supporter itself. They are therefore simple and economical to construct and to fit and may be easily applied and worn with feet of various contours. The aluminium being smooth and non-corrosive, is easily kept clean without danger of injuring the foot.

When my improved foot-arch supporters are worn in the shoes, currents of electricity will be produced in the feet and limbs. Generally speaking, these currents circulate in two distinct paths or circuits, one of which includes both feet, both limbs, and the lower portion of the body, the circuit being completed through the soles of the shoes and the ground between the feet. The current flows through this circuit when the person using the supporters walks upon the ground. The other circuit may be termed a "local" circuit, the current flowing through each foot from the heel upward and forward through the foot, thence downward to the plate of the supporter, returning through the plate to the heel, the currents flow through these circuits at all times being continuous and are so mild as not to be detected by the nerves of the foot. The production of the local currents is due to the fact that the aluminium supporter and zinc plate form a galvanic couple for one foot and the aluminium supporter and copper plate form a galvanic couple for the other foot, the moisture from the foot being the excitant at the same time that the foot completes the circuit and the flow of the current in the one couple being opposite to that in the other. In case of standing or walking on damp grounds both of these couples act in conjunction or "series," tending to produce a current upward through one limb, downward through the other limb, and back through the ground between the feet to the starting-point.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, an electric foot-arch supporter formed of aluminium to fit the sole of the foot and provided with a suitable electrode, whereby said aluminium supporter, and electrode will form a galvanic couple.

2. As a new article of manufacture, a pair of electric foot-arch supporters formed of aluminium to fit the soles of the respective feet and provided, one with a plate of copper and the other with a plate of zinc arranged in the heel portion.

3. As a new article of manufacture, a pair of electric foot-arch supporters formed of aluminium to fit the soles of the respective feet, each supporter being substantially three-quarters the length of the foot, extending from the heel to the ball, one of said supporters being provided with a plate of copper and the other with a plate of zinc arranged in the heel portion.

4. As a new article of manufacture, a pair of electric foot-arch supporters formed of aluminium to fit the soles of the respective feet, each supporter provided with a cavity, and a metallic plate having securing-lugs fastened in said cavity, one of said plates being copper and the other zinc.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK B. LEE.

Witnesses:
C. C. SCHOENECK,
M. B. SMITH.