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J. J. CLIFFORD
HEAT INSULATING INSOLE

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Fig.1.

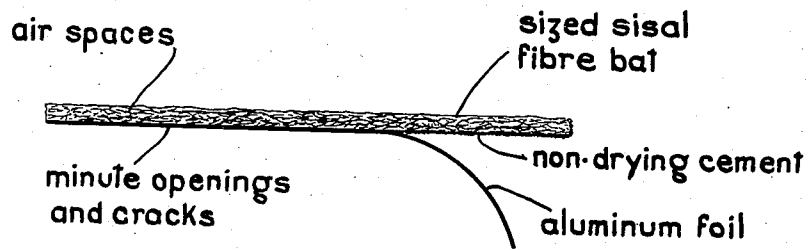
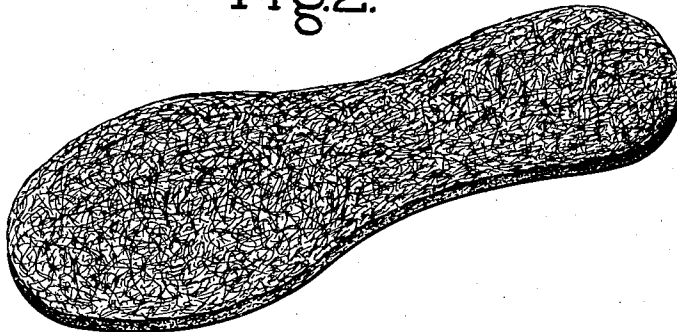


Fig.2.



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UNITED STATES PATENT OFFICE

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HEAT INSULATING INSOLE

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1 Claim. (Cl. 36—44)

This invention relates to insoles for shoes and the object of the invention is to present such an insole which shall have a high degree of heat-insulating characteristics and thus protect the foot of the wearer when the shoe is used on surfaces or in places where there is an unusual degree of heat.

The object of the invention is further to provide a simple, efficient heat-insulating insole which may either be built into the shoe during its manufacture or inserted in a finished shoe.

These and other objects and features of the invention will appear more fully in the accompanying description and drawing and will be particularly pointed out in the claim.

In the drawing:

Fig. 1 is an edge view illustrating a preferred form of sheet of material from which an insole embodying the present invention is formed.

Fig. 2 is a view in perspective illustrating an insole of the material illustrated in Fig. 1.

There has for some time been in use what is generally known as a "safety shoe" worn by iron and steel workers and others employed around iron and steel mills and other places where the floors and other places where the workers walk in the course of their employment are often at a high temperature. The main purpose of the present invention is to provide an insole for shoes subjected to such high temperatures and which will effectively insulate the foot of the wearer against the heat to which the shoe is subjected.

The invention for this purpose presents a composite insole made up essentially of two layers of material adhesively secured together, each of which layers has peculiar but different insulating properties, the united effect of which is to produce a very high degree of insulation against the passage of heat therethrough. One of these layers is aluminum foil. The other of these layers is composed of a bat of relatively coarse fibre. A coarse resilient fibre such as sisal is preferred.

Aluminum foil is an excellent heat insulator particularly due to its function of reflecting heat from its surface. The bat of fibre essentially presents throughout its mass an infinite number of air spaces between the interlaced and entangled fibres and bunches and strands of fibre, causing the bat as a whole to possess a high heat-insulating property. The combination of the aluminum foil and the bat of fibre in which both elements thus are highly effective heat insulators forms an insole which efficiently protects the wearer of the shoe in which it is embodied against discomfort from any heat to which the

shoe may be subjected without injury to the shoe itself. The aluminum foil and the bat of fibre are adhesively secured together by a suitable cement which should be of a non-drying character or a character which will not dry out under heat conditions. A synthetic rubber cement known as "Vistanex" has been found suitable for this purpose.

The bat of fibre is preferably heavily sized with any ordinary starch size and is pressed into an even layer of substantial thickness. The sized bat of fibre and the aluminum foil are adhesively secured together preferably in the form of sheet material and then the insole cut or died out therefrom.

The pressure employed in adhesively securing together the aluminum foil and the bat of fibre, due largely to the irregular surface of the bat juxtaposed upon the foil, causes a multiplicity of minute openings and cracks to be formed through the foil and these are augmented by the pressure upon, and flexing of, the insole when in use in the shoe. Due to the inherent porosity of the bat of fibre and of these openings and cracks, sufficient air for ventilation may pass through the insole.

In the drawing, Fig. 1 illustrates more or less diagrammatically a side elevation of the sheet of materials with the aluminum foil shown at the right separated and with the non-drying cement indicated. It will be seen that the bat of fibre presents an infinite number of air spaces. The openings and cracks of the aluminum foil are hardly visible to the naked eye but are readily apparent when smoke is blown through the composite structure.

A completed sole is indicated in Fig. 2. The aluminum foil is placed at the bottom. Such a sole is preferably built into the shoe, being placed between the outer sole and the regular innersole of the shoe and may take the place wholly or in part of the usual filler forming a part of the shoe. Such an insole embodying the invention may also be used by being placed in a finished shoe and in such case should be provided on the top surface with a covering layer of cloth or other material.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

An insole for shoes for insulating the foot of the wearer against heat to which the shoe may be subjected through the bottom and for securing ventilation, consisting of a bottom layer of aluminum foil, a top layer of a bat of coarse resil-

ient fibre typified by sisal fibre with the said bat heavily sized and containing an infinite number of air spaces, and a non-drying synthetic rubber cement securing the said layers together, the said aluminum foil presenting a multiplicity of minute openings and cracks therethrough, the air spaces of the fibre bat together with the open-

ings and cracks of the foil acting to secure ventilation and the air spaces of the bat together with the heat reflecting surface of the foil acting to insulate the foot of the wearer against the said heat.

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