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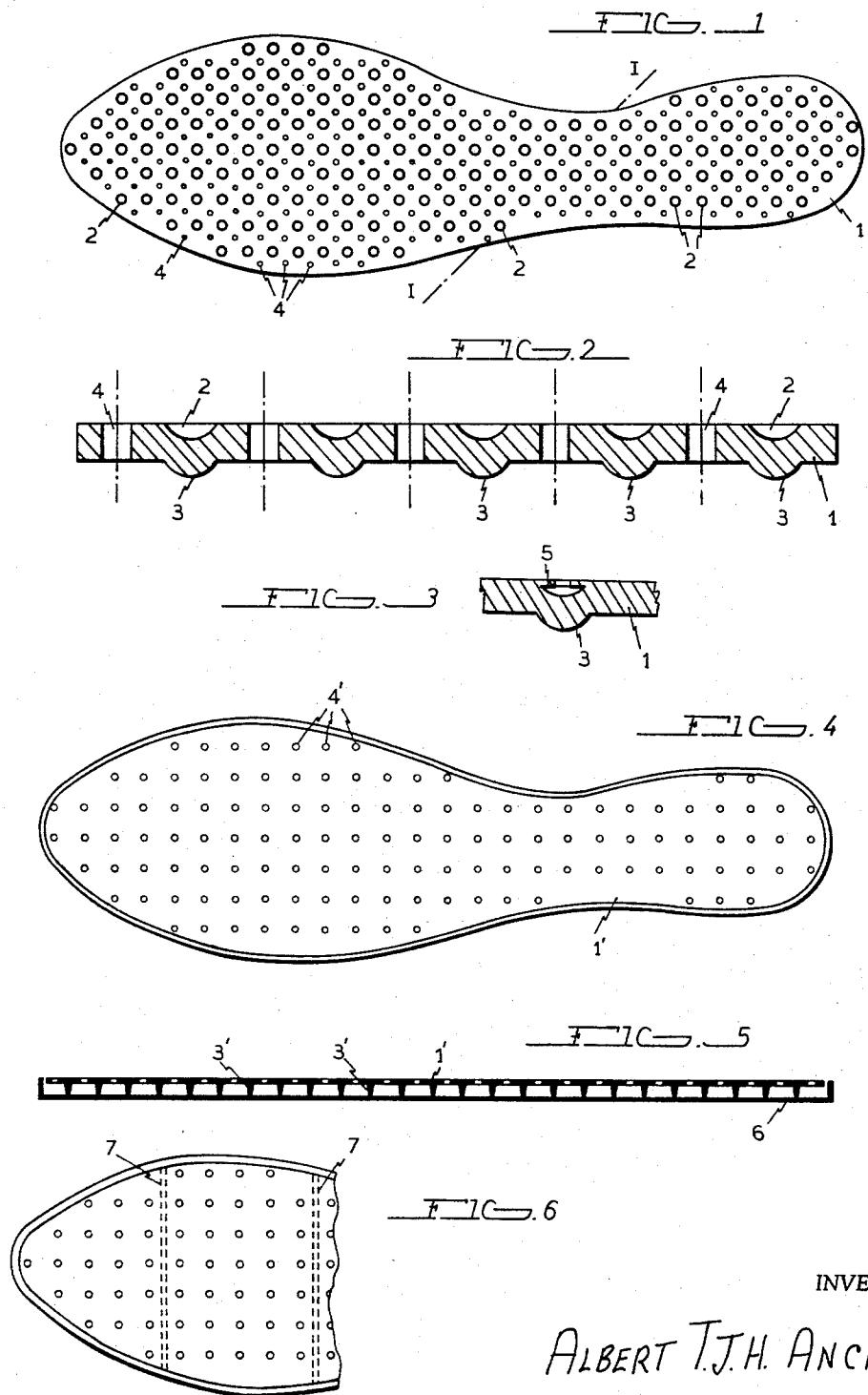
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SHOE SOLE

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Sheet 1 of 2



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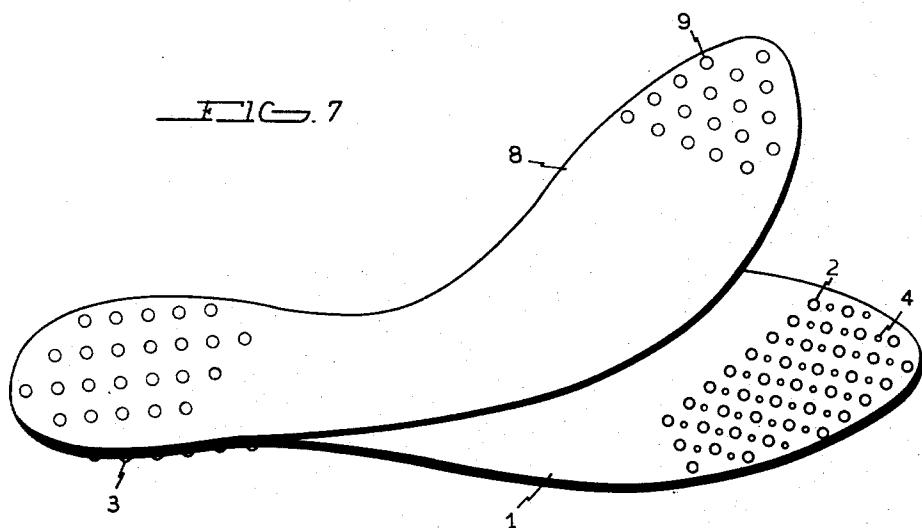
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SHOE SOLE

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ABSTRACT OF THE DISCLOSURE

An insole for a shoe or the like is provided having upper and lower surfaces of resilient material, said upper surface of said sole being provided with a plurality of blind recesses open in the area in contact with the sole of foot and of sufficient diameter to allow intrusion of plantar tissue therein during walking, said upper surface being free from projection in the contact area, and said lower surface of said insole being provided with a plurality of corresponding projections opposite said recesses, whereby during the action of walking the diameter of said recesses is increased by foot pressure and contracts when the foot is raised.

The present invention relates to a shoe sole which is either internal and removable or incorporated in the footwear, shoe, boot, wooden-soled shoe or similar article, and which, at each step taken by the wearer, produces local modifications of the air pressure on a level with recesses which are open on the side in contact with the sole of the foot.

One of the characteristics of the invention resides in the fact that the sole is provided, on the side intended to come in contact with the sole of the foot, with recesses distributed over at least a part of its surface, and that these recesses, open on the side corresponding to the sole of the foot, undergo local modifications of the air pressure after each step, resulting in a pressure effect when the foot is placed on the ground and in a suctional effect when the same foot is raised.

The invention will be understood more completely from the detailed description given below, together with the accompanying drawings, illustrating various ways in which it can be carried out.

In these drawings:

FIG. 1 is a plan view of a sole.

FIG. 2 is a sectional drawing, on a larger scale, along the line I—I of FIG. 1.

FIG. 3 illustrates an alternative version of a recess.

FIG. 4 is a plan view of a sole, according to an alternative version.

FIG. 5 is a longitudinal section through the sole shown in FIG. 4.

FIG. 6 illustrates a variant of FIG. 4.

FIG. 7 shows a sole with a "moderating grid."

In the version shown in FIGS. 1 and 2, a sole 1, made of polyethylene, for example, is provided over the whole of its upper surface with recesses 2, whereas on the lower surface these same recesses have a relief 3.

Between the various recesses 2 perforations 4 are provided, enabling the air to circulate from one surface of the sole to the other.

When the foot is resting on the sole, with a greater or smaller pressure, according to the position of the foot when the wearer is walking or running, the surface of the sole of the foot tends to penetrate into the recesses, creating a certain pressure in them, while when the foot is raised from the ground, for example, the recesses form suction devices, which leads to a congestion of the various points affected in the sole of the foot and to an automatic massaging effect assisting the circulation of the blood, causing the sensation of cold to decrease or disappear,

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and also preventing chilblains, cracks in the skin, acrocyanosis and other afflictions.

The circulation of the air is increased by the compression of the relief parts 3 and by their restoration to their normal shape when the foot is raised, thus producing an air pumping effect underneath the sole and causing this air to be re-cycled in the shoe. Quite naturally, this circulation of the air at the same time assists the renewal of the air in the footwear.

According to a further characteristic of the invention, and for purposes of hygiene and even of medical treatment, a suitable powder is then introduced into the recesses and is progressively and slowly dispersed in order to ensure a beneficial action over the surface.

Very good results have been obtained in tests carried out with a powder consisting of menthol, camphor, boric acid and talcum; it is also possible to use other anti-septic, deodorizing drying, tonic, anti-pruriginous and anti-mycotic substances.

A diaphragm 5 which partly seals up the recess 2, is provided, in accordance with FIG. 3, in order to retain the powder more satisfactorily in the recesses.

The sole does not undergo any final impregnation of powder but is supplied with a certain amount of this latter, this supply being renewed after any cleaning of the said sole.

In FIGS. 4 and 5, the element 1' is provided with a series of perforations 4', while its lower surface is provided with rough projections 3' which rest in a "cup" 6, into which the element is accurately fitted, thus forming a homogeneous assembly.

In this case the perforations 4' will act as air expulsion devices, the air being expelled from the cup by these perforations when the rough projections 3' are compressed, whereas a suction effect is exerted when the projections resume their normal shape.

Needless to say, partitions 7 can be provided in the cup 6, in order to form one or more compartments (FIG. 6), in addition to which the sole can be incorporated in the footwear when the latter is manufactured, possibly forming an integral part of the sole of the shoe.

It has been found in practice that with certain people the capillary pumping and suctional effect may exceed the normal level, thus causing discomfort to the tissue of the sole of the foot.

Fortunately, it has also been found in practice that the user often becomes accustomed to the wearing of the sole, with a progressive restoration to normal during the days following a normal vasomotor action.

This hypercongestion, often momentary, may be caused by various factors, particularly by an increase in the ambient temperature, or the fact that the capillary tissue is more sensitive or more vascularised in the initial stages, the tissue of the sole of the foot being finer.

For this reason, the present invention also provides for a sole in the form of a grid, or a "grid sole," which performs the function of a "moderating sole."

The accompanying FIG. 7 shows a main sole 1 of which the upper surface is provided with recesses 2, while on its lower surface these same recesses have a relief 4. Between the various recesses 2, perforations 4 are provided for the purpose of enabling the air to circulate from one surface of the sole 1 to the other.

A fine grid sole 8, without relief, and either movable or fixed, is provided with a multiplicity of holes 9 and is superimposed on the sole 1, known as the main sole, in order to reduce the "pumping and suction effect" exerted by the latter sole on the tissue of the sole of the foot.

It will be understood that the holes of the sole 8 need not necessarily correspond to the recesses 2 of the main sole or to the perforations 4.

The powder added will thus be more satisfactorily and more evenly distributed through the multiple holes 9 of the sole 8.

The sole 8 is superimposed on the sole 1 whenever the user so desires and particularly in very hot weather or after very vigorous curative exercises, when the tissues of the sole of the foot are particularly sensitive. It should be noted that when the sole 8 is placed in position, above the sole 1, all the physiological characteristics of the sole 1 used by itself are reproduced, but owing to the reduction of the "pumping and suction effect" exerted on the tissue of the sole of the foot it performs the function of a "moderating sole."

The invention has been described and illustrated purely for purposes of information, and without any limitative effect, and numerous modifications can naturally be made to the details of the invention, without departing from the scope thereof as defined in the following claim.

I claim:

1. A sole for a shoe or the like comprising, in combination an upper sole element made of resilient material and having upper and lower surfaces, said upper surface being provided with a plurality of blind recesses open in

the area in contact with the sole of the foot and of sufficient diameter to allow intrusion of plantar tissue therein during walking, said upper surface being free from projections in the contact area, said lower surface being provided with a plurality of corresponding projections opposite said recesses, whereby during the action of walking the diameter of said recesses is increased by foot pressure and contracts when the foot is raised, and a cup-shaped filler sole element receiving said upper sole element therein to form a homogeneous assembly

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