

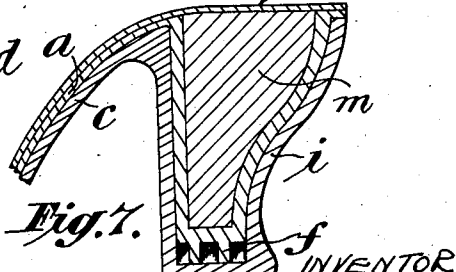
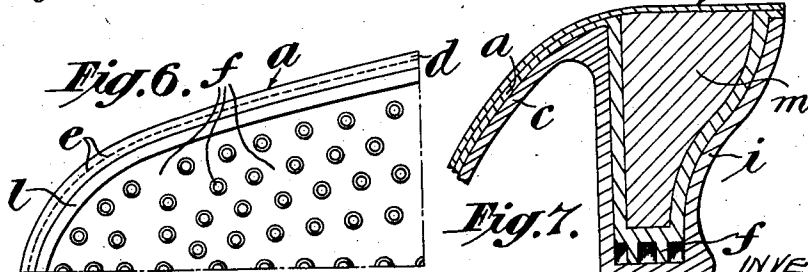
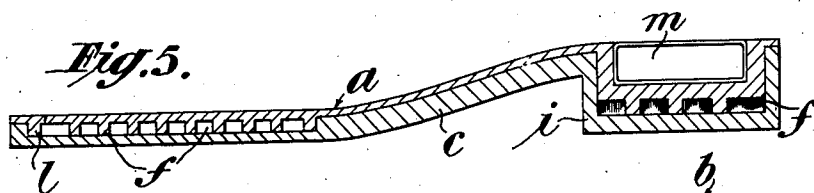
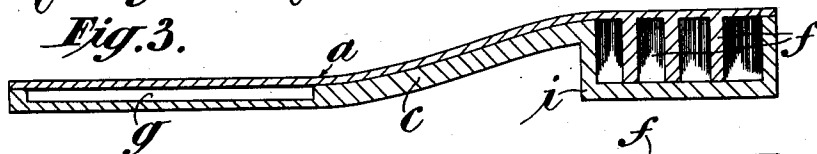
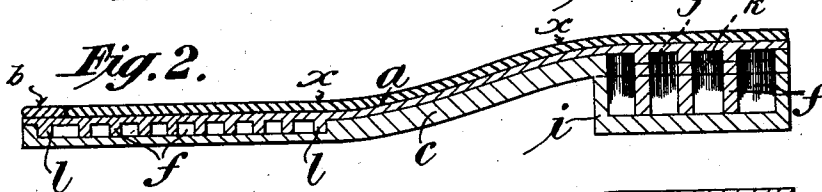
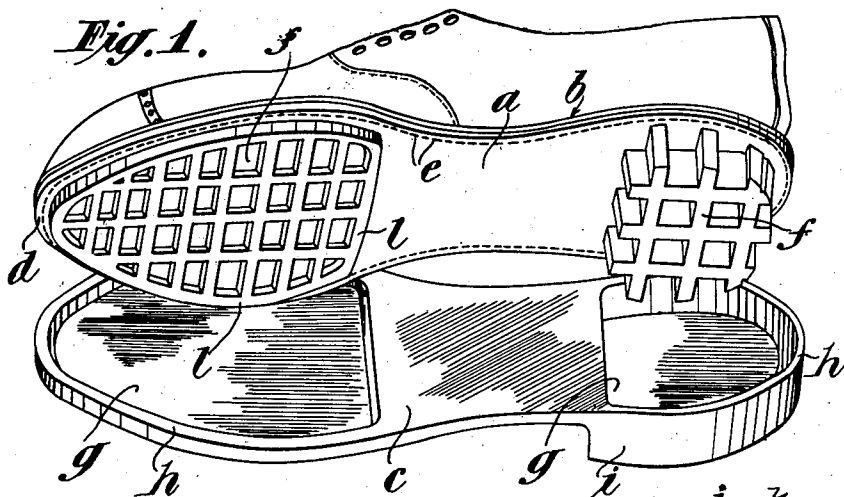
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1,559,532

G. SMITH

COMBINED SOLE AND HEEL FOR FOOTWEAR

Filed March 10, 1925



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UNITED STATES PATENT OFFICE.

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COMBINED SOLE AND HEEL FOR FOOTWEAR.

Application filed March 10, 1925. Serial No. 14,494.

To all whom it may concern:

Be it known that I, GEORGE SMITH, a subject of the King of Great Britain and Ireland, and a resident of Islington, county of London, England, have invented a certain new and useful Improvement in Combined Soles and Heels for Footwear (for which I have filed an application in England, #228,615, dated Nov. 6, 1923, not yet patented), of which the following is a specification.

This invention relates to the manufacture of resilient soles for boots and shoes of the type in which an intermediate resilient sole or section has a cellular structure to permit of resilient deformation of the walls of the cells and an outer sole or section covers in the cellular structure of the intermediate sole or section and forms the surface for direct contact with the ground.

According to the invention, the intermediate sole, preferably of rubber, is directly sewn to the welt, the stitches passing through a flat flange round its edge, and its upper surface is in contact with and may be cemented to the insole proper or to a suitable outer layer under the insole and surrounded by the welt. Set back a suitable distance from the edge on the underside of the intermediate sole and projecting therefrom is preferably arranged a rim or wall and inside this again are a series of cells whose walls may either project from and be formed integrally with the intermediate sole, or may be formed of a series of transverse sections of rubber tube cemented thereto, or the cellular structure, instead of consisting of a series of distinct cells, may be formed by the projection from the surface of the intermediate sole of a series of resilient studs. The outer sole of rubber or other suitable waterproof resilient material has a projecting rim round its edge on the upper surface which takes over the rim and projecting portions on the intermediate sole like a box lid and is attached to the flange of the intermediate sole so as to cover the stitches and to other parts of the intermediate sole with which it contacts by means of a suitable adhesive.

In order that the said invention may be clearly understood, reference is directed to the following description and accompanying sheet of drawings, wherein:—

Figure 1 is a perspective view of a shoe embodying the invention in one form and showing the components detached.

Figure 2 is a longitudinal section of the two components fitted together, section taken approximately through the central longitudinal axis.

Figure 3 is a view similar to Figure 2 illustrating a modification.

Figure 4 is a view similar to Figure 2 illustrating a further modification.

Figure 5 is a view similar to Figure 2 illustrating another modification.

Figure 6 is a fragmentary view in inverted plan of a modified form of the under-part.

Figure 7 is a vertical section of a lady's Louis heel to be used conveniently in connection with the invention.

The sole and heel is constructed of two parts, the intermediate sole or section *a* being for direct sewing attachment to the welt, or the like *b* (Figures 1 and 7), and the other section *c* (the outer sole) being adapted to cover in the other component *a* and to be secured thereto by suitable adhesive.

The intermediate section *a*, which is preferably of rubber, rubber fabric or other suitable waterproof material, lies flatly on the welted boot or the like, conforming to the shape thereof, and is sewn at *e* around its edge *d* to the welt or the like *b* and in contact with the insole designated as *x* or a lining under it. It has soft resilient portions *f* projecting, one set at the sole and one at the heel, their boundaries being set in from the edge of the intermediate section so as to leave the flange *d* for said sewing *e*.

The outer sole or section *c* has box-like recesses *g* which correspond with and closely fit over the projecting cellular or resilient portion *f*, the rims *h* resting on the sewn flange *d* of the inner sole *a*, and flush with the edge of the boot welt *b*. Before the outer sole *c* is fitted in such fashion, a coating of adhesive is applied to surfaces which will lie against the intermediate section *a*. The exterior face of the outer sole may be fashioned with a sole-shape tread and a heel *i* (which may be reinforced by non-slip embedded members). Or, in heel-less footwear, the enlargements *i* need not be employed, and—referring to Figure 2—the bottom of the box-like recess *g* could terminate

at the dot-and-dash line *j* and the tread surface at line *k*.

The projecting cellular or resilient parts *f* referred to may be of any design, e. g. right-angular criss-cross webs in reticular fashion as in Figures 1, 2, 3, (heel only), 5 and 7, or may be of sponge rubber (Figure 4) or other soft springy material. Or they may be constituted by an area or block of nipple-like studs (Figure 6). The studs, reticulations, sponge-rubber, or other forms may be bounded, if desired, by a rim such as *l* (Figures 1, 2, 5 and 6), or such a rim may be omitted, as is shown clearly by the heel projection *f* in Figure 1.

For the purpose of supplying rigidity to the projecting resilient parts, as, for instance, at the heel (where the increased depth may otherwise result in too great a flexibility to the heel as a whole), a reinforcement can be furnished. In one form of this modification the resilient projection of the intermediate section *a* is formed as a hollow box opening on that face of the said section which is to be secured to the welt or the like. The cavity of said box is filled with a block or core *m* of suitable light rigid material, as, for example, wood, vulcanized fibre and so forth, (Figure 7), or a hollow aluminium box or equivalent (Figure 6). The exterior of such projecting box, which fits into the recess *g* aforesaid formed in the outer sole *c*, is formed to a limited degree with the resilient means or cushion *f* as will be seen in Figures 5 and 7. For example, the vertical wall may be plain but the base constructed in the cellular, sponge or other fashion for a requisite depth. It will be obvious that the same purpose will be served if the projecting resilient portion is not box-like with a stiff core as illustrated, but integrally formed as a very hard vulcanized or other projection with

merely its exterior or part thereof resiliently softened.

As previously mentioned (with reference to Figure 2), for sports wear or for other purposes, the outer sole *c* need not necessarily be fashioned with a heel portion *i*; and with any form of outer sole exterior configuration, there may be employed merely one projecting resilient part *f* from the intermediate sole which extends throughout the sole, heel and waist, and interlocks with a corresponding recess in the outer sole. Or, as a further modification, the projecting parts may be located on the sole, waist and heel or other portion, not necessarily being restricted to two in number as illustrated in the drawings.

As a further form, more recesses *g* may be employed in the outer sole *c* than there are projecting parts *f* from the inner sole *a* so that a plain pneumatic chamber is presented when the parts are assembled, as, for instance, at the waist, or at the half-sole as seen in Figure 3.

I claim:—

In a boot or shoe, the combination with the insole and the welt, of a sole unit including a full length outer wear section having separate ball and heel recesses, an intermediate section adapted to lie next to the insole and the welt and secured to the latter at its edges, said intermediate section having spaced ball and heel cushion elements carried by the bottom face thereof and adapted to fit in said recesses of the outer wear section, and means for connecting the outer wear section and the intermediate section carried by the welt.

In testimony whereof I have affixed my signature hereto this 27th day of February, 1925.

GEORGE SMITH.