

Aug. 29, 1944.

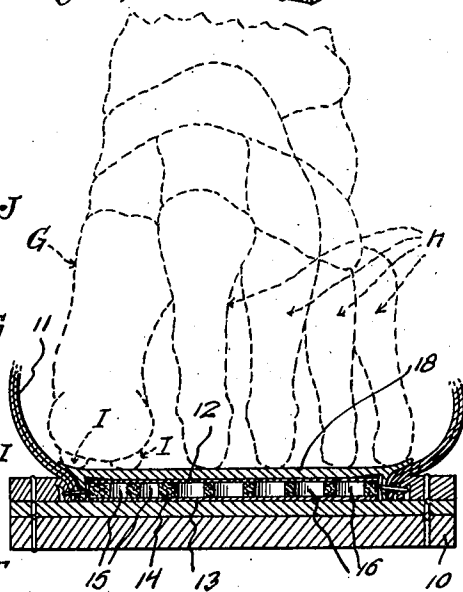
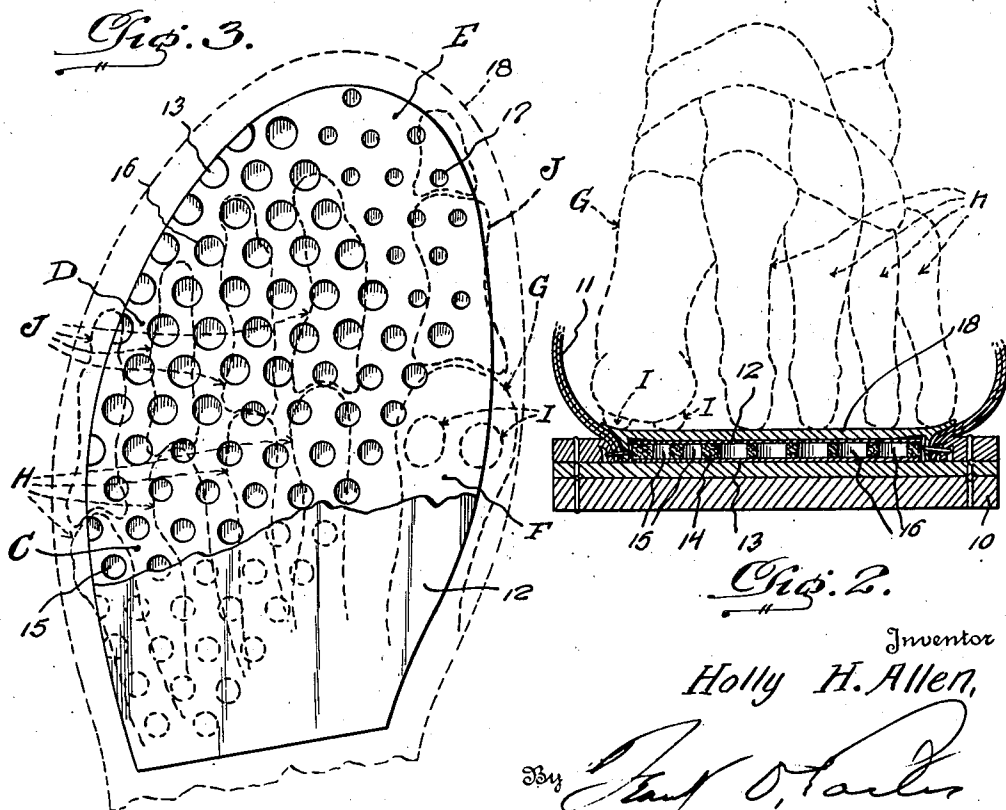
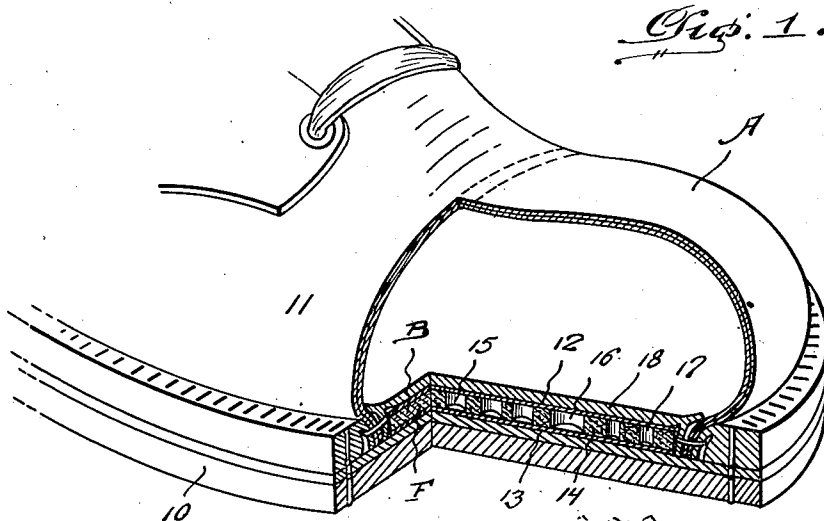
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2,356,808

ORTHOPEDIC SHOE AND FILLERS THEREFOR

Filed May 15, 1943

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

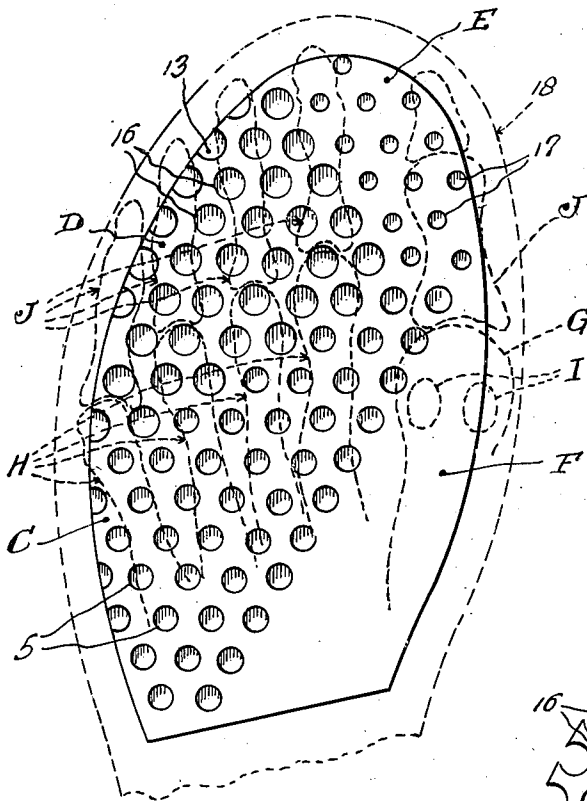


Fig. 4.

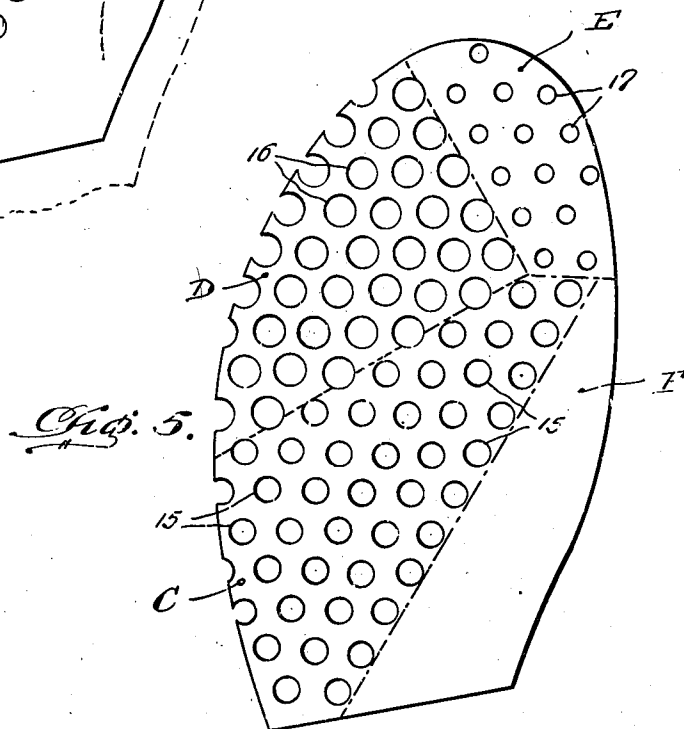


Fig. 5.

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UNITED STATES PATENT OFFICE

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ORTHOPEDIC SHOE AND FILLER THEREFOR

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6 Claims. (Cl. 36-8.5)

The invention relates to footwear construction, and more particularly to sole fillers for shoes, boots, or other footwear.

In the study of foot ailments it has been found that the majority of these ailments are caused by unequalized distribution of the weight of the body upon the feet. Instead of considering the foot as a single unit, let it be considered as seven separate weight bearings, consisting of the five metatarsal bones and the heel. The fore part of the foot has six points of weight transmission, each representing an equal share of pressure. First to consider is metatarsal bone number one and the two sesamoid bones underlying the head of metatarsal bone number one which furnishes it with two points of contact. The four other metatarsal bones and the heel furnish the five remaining points of contact with the ground.

Therefore, the primary object of the invention is the provision of a sole filler for footwear, wherein proper distribution of weight upon the feet from the body of the wearer will be effected, and successfulness in equalizing the weight bearing of the foot had.

Another object of the invention is the provision of a sole filler of this character, wherein the construction thereof is novel in its entirety, to prevent and assure relief from severe foot ailments in the use of the filler.

A further object of the invention is the provision of a sole filler of this character, which is simple in its construction, thoroughly reliable and efficient in purpose, strong, durable, and inexpensive to manufacture and install, it being built into the footwear in the manufacture thereof, although the filler may be installed after the footwear has been completed or manufactured.

With these and other objects in view the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described in detail, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention, and pointed out in the claims hereunto appended. It is to be understood that changes, variations and modifications may be made in the invention as come properly within the scope of the annexed claims, without departing from the spirit of the invention or sacrificing any of its advantages.

In the accompanying drawings:

Figure 1 is a fragmentary perspective view partly broken away of a shoe showing the filler constructed in accordance with the invention installed therein.

Figure 2 is a vertical transverse sectional view through the sole area of the shoe showing diagrammatically the bone structure of a foot when confined therein and its disposition with respect to the filler.

Figure 3 is a top plan view of the filler showing portions thereof broken away, and diagrammatically by dotted lines the bone structure of a near perfect foot in relation of the said filler.

Figure 4 is a top plan view of the filler showing portion thereof broken away and diagrammatically by dotted lines the bone structure of a foot with the short first metatarsal bone in relation to said filler.

Figure 5 is a plan view with the upper section or layer of the filler removed, showing the four different areas thereof in detail.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, A designates generally a portion of a shoe, which may be of any conventional style having the usual sole 10, it being joined with the body 11 of the shoe in any ordinary or well known manner, while interiorly of the said shoe and covering the sole is the filler B constituting the present invention and hereinafter fully described.

The filler B comprises upper, lower and intermediate sections or layers of material 12, 13 and 14, respectively. The sections or layers are of identical marginal contour, and the upper and lower sections or layers 12 and 13 are preferably made from sheet fibrous material, as for example, gasket forming material, although other suitable material may be used. The intermediate section or layer 14 is preferably made from compressed ground cork in sheet form, although any other compressible material may be substituted for giving the required cushioning effect desired. The sections or layers 12 and 13 at their faces next to the intermediate section or layer 14 are joined with the latter, as a heavy coating of rubber cement is applied to the said intermediate section or layer at both sides thereof. This coating of rubber cement is absorbed to a considerable degree by the cork section or layer 14 and functions to keep the cork alive and flexible in addition to the joining of the upper and lower sections or layers 12 and 13 to the intermediate section. These sections or layers 12 and 13 when joined with the intermediate section or layer 14 seals the respective holes or perforations 15, 16 and 17, these being grouped according to their varying sizes within the areas C, D and E, respec-

tively, of the said intermediate section or layer 14. This section or layer 14 has an imperforate area F in addition to the said perforated areas C, D, and E, respectively. The sealing of the holes or perforations 15, 16 and 17 effect air pockets in the intermediate section or layer 14.

The filler B is confined beneath an innersole 18 which is of the type shown in Figure 1 of the drawings, and the said innersole is built into the shoe A in any selected manner.

When the shoe A is worn with the filler B in position the near perfect foot has its first metatarsal bone G resting over the imperforate area F of the filler, while the four other metatarsal bones H rest over the area C, and the sesamoids I resting over the area F, see Figure 3. The area E has the large phalange bones J resting over the same. Since the first metatarsal bone G and the sesamoids I carry twice as much weight as the four other metatarsal bones H, the area F will compress approximately one-half as much as the area C, thus keeping the five metatarsal bones G and H at near level to equalize the weight upon the foot.

In feet with the short first metatarsal bone positioned, as in Figure 4 of the drawings, foot action causes the second metatarsal bone to act as the principal leverage member. The third and fourth metatarsal bones also carry excess weight. It is to be noted that the four small metatarsal bones rest in the area D of the filler, which area has the larger holes or perforations 16, these allowing the filler at such area to compress approximately three times as much as the area F which supports the first metatarsal bone, thus keeping the five metatarsal bones at near level to equalize the weight bearing. Since the large phalange bone carries twice as much weight as the other phalange bones, by having small holes or perforations 17 in the area E, will allow all the phalange bones to stay at near level. The smaller phalange bones rest over the area D which has the largest holes or perforations 16 therein and the said near level of all phalange bones is maintained.

An object of the upper and lower sections or layers 12 and 13 to the filler is to keep the soft side of the leather which the said filler lies between from compressing into the holes or perforations in the intermediate section or layer 14 thereof.

Preferably the use of cork for the intermediate section or layer 14 of the filler will cause the latter to always stay in place and furnish enough cushion under the foot.

In the use of the filler B the foot will always retain equal weight bearing, cushion effect and

insulation from cold and heat when the said foot is confined within the shoe A. Also the filler B keeps the shoe A from running over and losing its shape.

What is claimed is:

1. A shoe sole filler comprising upper, lower and intermediate sections joined with each other, the intermediate section being compressible and having an imperforate and a plurality of perforate areas therein, the perforations in each area varying with respect to those in the other areas.

2. In a shoe, a sole, an innersole, and a sole filler between the sole and innersole and having an imperforate and a plurality of perforate areas at selected localities thereof, the perforations in each area varying with respect to those in the other areas.

3. A shoe sole filler comprising a cushioning element for association with a sole interiorly of a shoe for supporting the metatarsal-phalange joints of a foot, said element having an imperforate area for supporting the main metatarsal joint and a plurality of perforate areas for supporting the remaining metatarsal-phalange joints, each perforated area being provided with perforations of varying sizes with respect to the perforations in each of the other areas.

4. A shoe sole filler comprising a cushioning element for association with a sole interiorly of a shoe for supporting the metatarsal-phalange joints of a foot, said element having an imperforate area for supporting the main metatarsal joint and a plurality of perforate areas for supporting the remaining metatarsal-phalange joints, each perforated area being provided with perforations varying in size with respect to the perforations in each of the other areas, and upper and lower layers of material covering said element.

5. In a shoe, a sole, an innersole, and a sole filler between the sole and innersole composed of compressible material having an imperforate area for supporting the main metatarsal joint of a foot and a plurality of perforate areas for supporting the remaining metatarsal and phalange joints of the foot.

6. In a shoe, a sole, an innersole, and a sole filler between the sole and innersole composed of compressible material having an imperforate area for supporting the main metatarsal joint of a foot and a plurality of perforate areas for supporting the remaining metatarsal and phalange joints of the foot, each of the perforate areas having perforations varying in size with respect to each other.

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