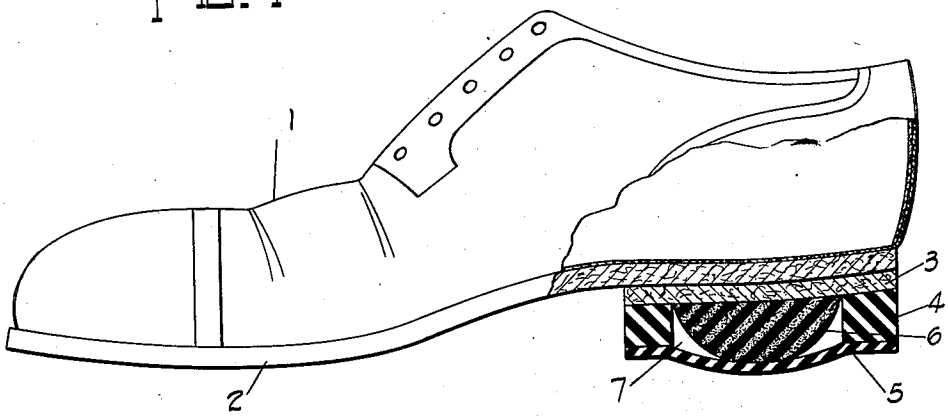
Dec. 5, 1950 S. STOINER 2,532,742

CUSHION HEEL

Filed Feb. 17, 1949

FIG. 1



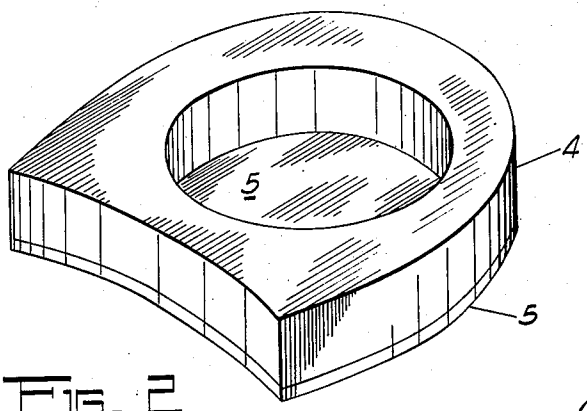


FIG. 2



FIG. 3

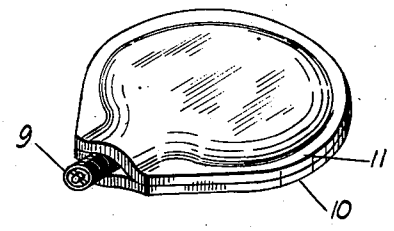


FIG. 5

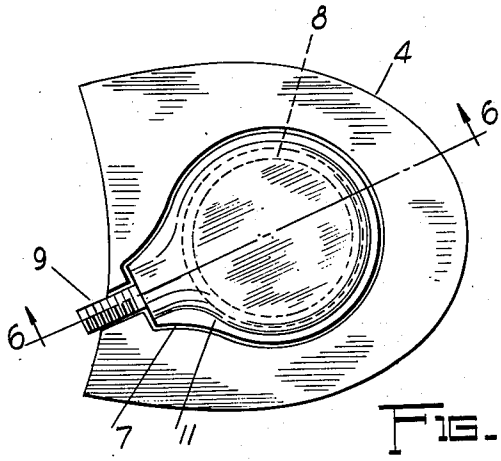


FIG. 4

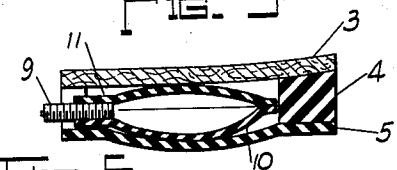


FIG. 6

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CUSHION HEEL

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Application February 17, 1949, Serial No. 76,968

5 Claims. (Cl. 36—35)

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This invention relates in general to resilient soles and heels for footwear, such as shoes, boots and the like, and more particularly to improvements in combined resilient and pneumatic constructions for such purposes.

One of the primary objects of the invention is to provide a built-in combined resilient and pneumatic outer sole and heel construction that will be simple and inexpensive to make and apply to the main sole and heel of the shoe.

Another object is to incorporate in such a built-in construction a sealed-in pneumatic cushion that extends downwardly past the rim of the outer sole and heel for cushioning effect for the shoe wearer.

Another object is to provide in such a built-in construction a lateral boundary, about the pneumatic cushion, of resilient weight supporting material.

A further object is to provide in such a built-in construction a tough resilient lower cover, relatively more pliable than the outer sole and heel side walls, as a means for more efficiently housing the pneumatic cushion and allowing the latter to perform its desired function.

With the foregoing and other objects in view, the invention resides in the combination of parts and in the details of construction hereinafter set forth in the following specification and appended claims, certain embodiments thereof being illustrated in the accompanying drawings, in which:

Figure 1 is a view in side elevation of a shoe, partly broken away, to show in section a heel provided with a sealed-in pneumatic cushion in which is located a hemi-spherical pad of material, such as sponge rubber;

Figure 2 is a view in top perspective of the heel removed from the shoe and the sponge rubber pad removed from the heel;

Figure 3 is a view in side perspective of the sponge rubber pad, itself;

Figure 4 is a view in top plan of the heel showing its concave upper surface occupied by a pneumatic bag having a valve stem;

Figure 5 is a view in side perspective of the air bag of Figure 4; and

Figure 6 is a view in section taken along line 6—6 of Figure 4.

Referring more particularly to the drawings, one form of the invention is shown in Figures 2 and 3 and shown applied to the heel of a shoe in Figure 1, it being understood that the invention is equally applicable to the sole of the shoe, as well.

In Figure 1, the shoe 1 is shown as having a

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main sole 2 and a main heel 3 to which latter the outer heel, comprising the invention, is shown to be secured.

The outer heel of the invention is made up to have its main supporting side walls 4 relatively thick and of rubber or like tough resilient material. This heel is cut to provide a central opening and to the lower surface of the heel is secured a relatively thin but tough, resilient and pliable cover 5 which embraces the opening and the entire periphery of the lower surface of the heel. Into the upper open side of the heel is then deposited a pad 6, generally of hemispherical form, so that its round surface rests in the opening on the upper inner surface of cover 5 and its flat side is uppermost. This pad is preferably such springy material as sponge rubber. Moreover, the pad 6 is preferably of such dimensions, and the cover 5 of such thickness, that when the heel is assembled, as shown in Figure 1, the pad causes the cover to be arcuately bowed downwardly and there remains a sealed-in air compartment 7 surrounding the pad in the assembled heel so as to provide a pneumatic cushion.

With respect to the illustration of one form of the invention as applied to a shoe heel it will be seen that there is provided a built-in combined resilient and sealed-in pneumatic cushion. As stated before, the pad normally bulges the lower cover downwardly so that in walking the initial shock to the walker is absorbed as the bulged cover strikes the ground by the pneumatic cushion of the entrapped air and the air within the sponge rubber pad itself and also by the inherent resiliency of the latter. Thus the cushion absorbs the initial shock before the side walls are called upon to do anything except to serve as a proper container for the cushion. It follows that beyond the initial impact, the side walls and cushion may cooperate as a shock absorbing combination. The location and size of the cushion is preferably carefully estimated in terms of pressures and shocks to the bone and nerve structures of the foot involved in walking, standing or running.

In Figures 4, 5 and 6 is shown another form that the invention may take, here shown as applicable to a heel, but it being understood that the construction is equally applicable to the sole.

In Figure 5, there is shown a bladder 8, having a valve stem 9, and encased between two strips 10 and 11 of rubber of greater thickness than the walls of the air bladder for protective purposes. In this case, the opening of the heel is

modified from the circular form of Figure 2 to that form of Figure 4 to accommodate the shape of the overall cushion of Figure 5 and permit the valve stem 9 to extend forward of the heel in an out-of-the-way position. Deflation of the bladder may be remedied by blowing it up through the valve stem.

In the following claims the term heel will be used as generic to both soles and heels to which both the present invention is equally applicable.

The walls 4 of the outer heel are sufficiently thick and tough to support the weight of the user without collapsing.

I claim:

1. In combination, a shoe having a main heel, and an outer heel fixed thereto, said outer heel including a resilient member of substantial thickness, a hollowed out portion, having sides and a bottom, in said resilient member of less depth than the thickness of said outer heel, a separate resilient cushioning member of greater thickness than the depth of said hollowed out portion seated in the opening in said portion in contact with the said main heel and the bottom of said portion, and a confined air space between the cushioning member and the bottom of the hollowed out portion aforesaid.

2. The combination in a shoe heel of an outer member having an opening therein, resilient side walls surrounding said opening and a resilient pliable member closing one end thereof, and a cushioning member having greater resiliency than the said side walls, the said cushioning member completely closing the end of the opening opposite the said flexible member, and formed so as to provide a closed air space between the cushioning member and the flexible member aforesaid.

3. A heel as claimed in claim 2 wherein the cushioning member is of relatively greater thickness in at least one dimension, than the resilient side walls.

4. A heel as claimed in claim 2 wherein the opening is cylindrical, the cushioning member is substantially hemispherical and is seated in the opening, so as to bring a portion of the round surface thereof in contact with the resilient pliable member.

5. The combination as claimed in claim 1 wherein the resilient cushioning member is at least a portion of a hemisphere having a flat surface and a round surface, the said flat surface being in contact with the main heel and the round surface contacting a portion of the bottom of said resilient member.

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