Nov. 11, 1930. W. M. COHAN ET AL 1,780,997

CUSHIONED HEEL FOR SHOES

Original Filed June 5, 1929

Fig. 1.

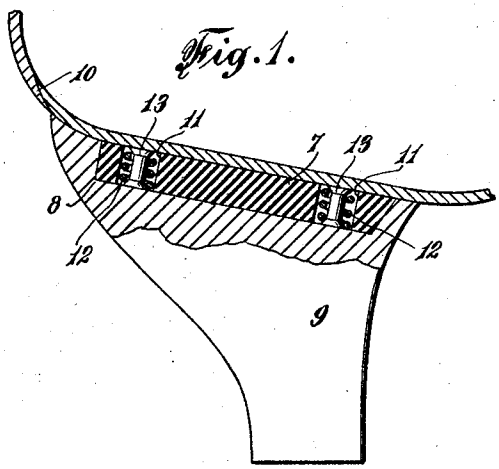


Fig. 2.

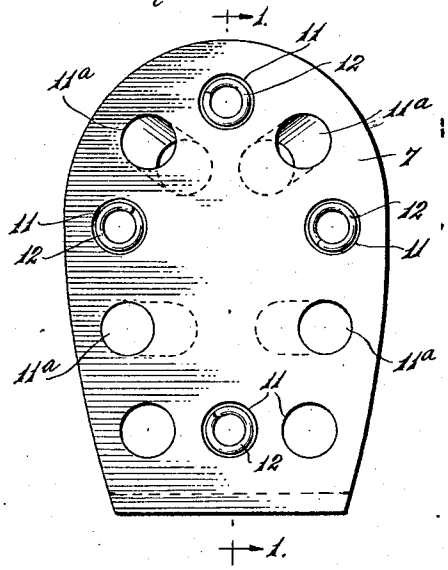
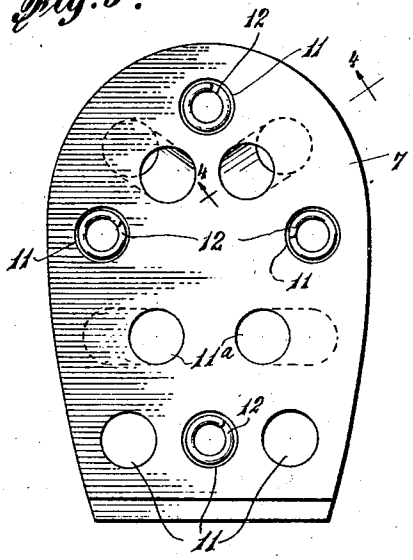


Fig. 3.



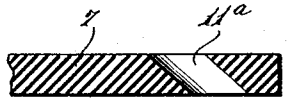


Fig. 4.

Fig. 6.

Fig. 5.

INVENTORS
William M. Cohan.
Michael N. Ratzan.
By John O. Seifert
ATTORNEY

Patented Nov. 11, 1930 1,780,997

UNITED STATES PATENT OFFICE

WILLIAM M. COHAN AND MICHAEL N. RATZAN, OF BROOKLYN, NEW YORK

CUSHIONED HEEL FOR SHOES

Application filed June 5, 1929, Serial No. 368,652. Renewed April 4, 1930.

This invention relates to shoe heels, and particularly to the provision of cushioning means arranged in the heel in interposed relation to the shoe heel and heel of the foot, and adapted to not only absorb the shock transmitted to the heel of the foot and from the heel to the body by the impact of the heel with the ground in walking, but also to compensate for varying forces of the shock of impact in walking as well as in standing, as distinguished from the type of cushioning means applied to the surface of the shoe heel to directly engage the surface walked upon, and it is the primary object of the invention to provide improved cushioning means for heels of this character which is simple in construction and efficiently produce the result sought.

While we are aware that in cushioning means for heels of this character it has been proposed to arrange the same in interposed relation to the heel of the shoe and foot and consisting of either a pad of yielding material, such as rubber, or such a pad in conjunction with springs, they are constructed and arranged whereby the resistance forces to the pressure of the heel of the foot are substantially equal for all portions of the cushioning means with the result that while they cushion the impact of the shoe heel coming in contact with the ground there nevertheless is a shock transmitted to the body and they do not function to cushion and absorb the shock of impact imparted to the forward part of the heel of the foot as the ball of the foot engages the ground in walking.

It is a further object of the invention to overcome the above disadvantages and provide cushioning means to be applied to a shoe heel in the form of a pad having greater resiliency about the marginal portion and particularly at the rear and forward portions of the heel, and adapted to more readily absorb the shock of the impact of the rear portion of the shoe heel coming in contact with the ground in walking, cushion the median portion of the heel as the forward or ball portion of the foot is brought into engagement with the ground, and absorb the shock of impact of the ball of the foot engaging with the ground and transmitted to the forward portion of the heel of the foot.

In carrying out the invention there is provided a recess in the shoe engaging surface of the heel, a block or pad of resilient material, preferably rubber, shaped to correspond to the recess being arranged in said recess in interposed relation to the shoe heel and inner sole of the shoe, the pad being arranged and provided with means to add greater resiliency thereto at the marginal portion of the pad and particularly rearwardly and forwardly of the median portion thereof. This is produced by perforating the marginal portion of the pad and arranging the perforations in a particular manner and engaging springs in certain of the perforations of greater resiliency than the material of the pad to compensate and equalize the forces of the pressure of the heel of the foot coming in contact with the pad.

While the improved cushioning means has been illustrated and will be described in connection with a heel for women's shoes and constructed of one piece, such as wood, it will be obvious that the invention is not limited to said use but is also applicable to heels built up of layers of leather, and to the heels of shoes for children and men.

In the drawing accompanying and forming a part of this application Figure 1 is an elevational view of a heel, partly in section, and showing our improved cushioning means applied thereto and showing the heel in relation to a portion of a shoe, the section of the cushioning means being taken on the line 1—1 of Figure 2 looking in the direction of the arrows.

Figure 2 is a view looking at the top of the cushioning means.

Figure 3 is a view looking at the bottom of the cushioning means.

Figure 4 is a sectional view taken on the line 4—4 of Figure 3.

Figure 5 is an elevational view of a resilient core arranged in springs in certain perforations in the pad; and

Figure 6 is a side elevation of a spring arranged in the pad perforations.

The embodiment of the cushioning means illustrated comprises a pad 7 of resilient material, preferably rubber, engaged in a recess 8 arranged in the side of the heel 9 engaging with the shoe 10, shown in a conventional manner and only so much being shown as is essential to an understanding of the invention. The invention is shown applied to a heel of the one piece type, usually of wood covered with a suitable material. The heel recess 8 and pad conform substantially in shape with one face of the pad substantially flush with the shoe engaging side of the heel and the inner surface of the bottom of the shoe and confined within the heel recess by the sole or the inner sole of the shoe.

To render the marginal portion of the pad, particularly at the rear and forward of the median portion, more resilient a series of transverse perforations are arranged about the marginal portion of the pad. Certain of the perforations, as indicated at 11, are extended through the pad at a right angle to the face thereof, while others at the rear and opposite side portions of the pad, such as 11ª, and arranged alternately with the perforations 11 are extended through the pad at an oblique angle to the face of the pad and in a direction from the marginal portion to the median portion of the pad to render the portions of the pad between the perforations 11 more yielding. The forward end of the pad extends in a straight line transversely of the pad and the perforations 11 at said end of the pad are arranged in alinement parallel with said end of the pad and extend through the pad at a right angle to the face thereof. The perforations 11 alternating with the oblique perforations 11ª have coiled compression springs 12 engaged therein to be confined between the wall of the heel recess and the sole or inner sole of the shoe, said springs having greater resiliency than the material of the pad. Preferably only the intermediate perforation at the forward end of the heel is provided with a spring 12, although in some instances it may be desirable to have springs arranged in each of said perforations. The springs 12 are provided with guiding and positioning cores 13 in the form of plugs of resilient material, such as rubber, and having greater resiliency than the material of the pad or spring. The intermediate portion of such cores 13 are of less cross sectional area than at the ends whereby to compensate for the spreading or flexing of the cores as the springs are compressed.

In the use of the cushioning means as described the ball of the heel of the foot in standing will be equalized on the central or median portion of the pad and cushioned thereby. In walking the rear portion of the heel is first brought into engagement with the ground with the weight of the body coming upon the rear marginal portion of the pad and as the shoe heel engages with the ground the shock of the impact thereof will be absorbed in the spring 12 and partially in the spring cores or plugs 13. As the foot is rocked or moved on the rear portion of the heel in the movement of the foot in engaging the ball of the foot with the ground the ball of the heel will engage the median and less yielding portion of the pad, and as the ball of the foot engages the ground the shock of the impact thereof will be absorbed in the springs 12 and forward perforated portion of the pad. The forces of the pressure of the heel of the foot on the pad will be equalized through the springs.

Having thus described our invention we claim:

1. In combination with a shoe, a shoe heel having a recess at the shoe engaging side thereof, cushioning means arranged in the heel recess comprising a pad of resilient material conforming to the shape of the recess and arranged with perforations about the marginal portion thereof, and springs having greater resiliency than the material of the pad arranged in alternate perforations confined between the shoe and the bottom wall of the heel recess.

2. Cushioning means for heels of shoes as claimed in claim 1, wherein the springs are arranged with cores of yielding material having greater resiliency than the springs.

3. Cushioning means for heels of shoes as claimed in claim 1, wherein certain of the perforations are extended through the pad at an oblique angle.

4. Cushioning means for heels of shoes as claimed in claim 1, wherein the perforations in which the springs are engaged extend through the pad at a right angle to the face of the pad, and the perforations alternating with the spring engaging perforations at the rear and opposite sides of the pad are extended through the pad at an oblique angle to the surface of the pad and extend in a direction from the marginal to the median portion of the pad.

5. In combination with a shoe, a shoe heel having a recess in the shoe engaging side thereof, and cushioning means arranged in the heel recess comprising yieldingly compressible means having greater compressibility and resiliency about the marginal portion of the heel than at the median portion thereof.

WILLIAM M. COHAN.
MICHAEL N. RATZAN, M. D.