Dec. 28, 1948. J. S. MacARTHUR 2,457,481

ARCH SUPPORTING DEVICE

Filed Jan. 28, 1947

Fig. 1.

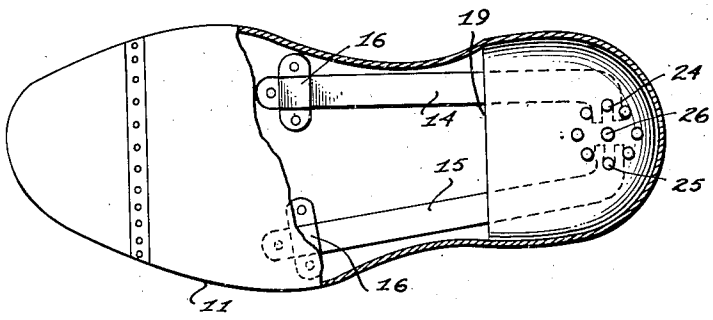


Fig. 2.

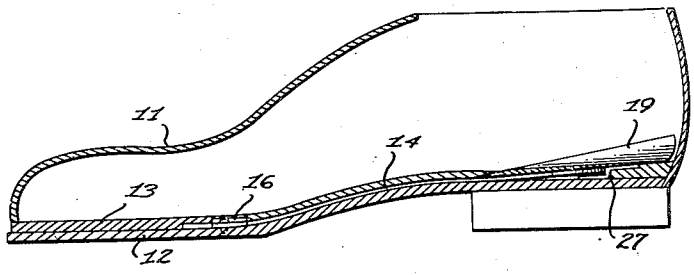


Fig. 4.

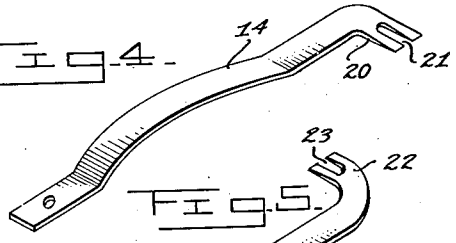


Fig. 5.

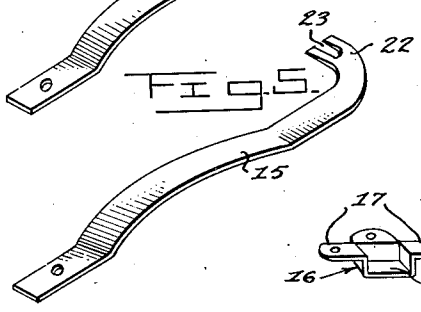
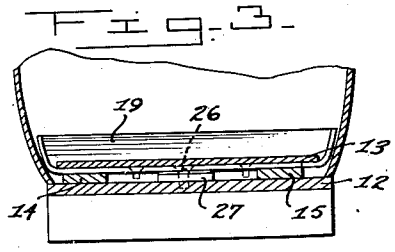


Fig. 6.

Fig. 3.



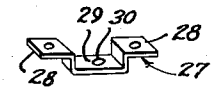


Fig. 7.

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Patented Dec. 28, 1948 2,457,481

UNITED STATES PATENT OFFICE

2,457,481

ARCH SUPPORTING DEVICE

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Application January 28, 1947, Serial No. 724,841

7 Claims. (Cl. 36—71)

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This invention relates to arch support devices, and more particularly to arch supporting inserts for shoes, slippers or other footwear.

A main object of the invention is to provide a novel and improved arch support device for shoes or other footwear which is very simple in structure, easy to install and adjustable over a wide range of shoe sizes and shapes.

A further object of the invention is to provide an improved arch supporting device which is inexpensive to manufacture, provides an efficient and comfortable arch supporting action, and which may be installed either during the fabrication of shoes or in completed shoes.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a top plan view, partly in cross-section, of a shoe provided with an arch supporting device according to the present invention.

Figure 2 is a vertical longitudinal cross-sectional view of the shoe of Figure 1 but showing a modification of the arch supporting structure.

Figure 3 is an enlarged vertical transverse detail cross-sectional view taken through the sole portion of the shoe of Figure 2.

Figure 4 is a perspective detail view of one of the arch supporting springs employed in the structure of Figure 1.

Figure 5 is a perspective detail view of another arch supporting spring employed in the structure of Figure 1.

Figure 6 is a perspective detail view of a spring holding bracket employed in the structure of Figure 1.

Figure 7 is a perspective detail view of another spring holding bracket employed in the structure of Figure 2.

Referring to the drawings, 11 designates a shoe having a bottom sole portion 12 and a superimposed sole portion 13. Secured on bottom sole portion 12 and extending over the shank portion of the shoe are a pair of arched metal springs 14 and 15, each spring being located adjacent a side of the shoe. The forward ends of the springs are received in respective holding brackets 16, 16 fastened to bottom sole portion 12, each bracket 16 comprising a plurality of tabs 17 for securing it to said bottom sole portion, and a box-like recess portion 18 for receiving the end of an arch spring. One of the brackets 16 is shown in inverted position in Figure 6.

Overlying and secured to the rearward ends

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of the arched springs 14 and 15 is a metal heel plate 19. Spring 14 is formed at its rear end with an inwardly directed portion 20 having an elongated notch 21. Spring 15 is formed at its rear end with an inwardly directed portion 22 having an elongated notch 23. The rear ends of springs 14 and 15 are secured by respective rivets 24 and 25 joining the respective elements 20 and 22 to the heel plate 19, said rivets passing through the respective notches 21 and 23. The heel plate 19 is secured to bottom sole portion 12 by a rivet 26.

Where the shape of the shoe requires the rear ends of springs 14 and 15 to be closer together than as shown in Figure 1, the rivets 24 and 25 may be omitted and the elements 20 and 22 overlapped with the rivet 26 passing through the aligned notches 21 and 23. The elements 20 and 22 are preferably bevelled so that they may be overlapped and still lie in the same plane.

To reinforce the securement of elements 20 and 22 when they are overlapped, a bracket 27 is employed having tabs 28, 28 adapted to be secured to heel plate 19, and having a channel-shaped intermediate portion 29 adapted to receive the overlapped elements 20 and 22. The rivet 26 then passes through an opening 30 provided in channel portion 29.

The upper sole portion 13 is superimposed over the springs 14 and 15 and is suitably recessed to accommodate the brackets 16, 16. Said upper sole portion 13 preferably extends rearwardly into overlying relationship with the heel plate 19 so that the rivet heads 26, 24 and 25 are covered thereby.

In adapting the invention to a completed shoe, the heel of the shoe is removed and an extra bottom sole member is employed, said extra bottom sole corresponding in function to the bottom sole 12. The original bottom sole then corresponds to upper sole member 13 in Figure 2. The extra bottom sole then carries the arched springs and a heel plate such as 19 is secured inside the shoe to the ends 20 and 22 of the springs by rivets, as above described, the rivets passing through the leather at the heel portion of the shoe to engage in the notches 21 and 23 in the alternative manners described above. The extra bottom sole member is then fastened to the original bottom of the shoe by stitching or other suitable means and the heel is replaced.

The arch springs 14 and 15 are fabricated from suitable spring metal such as a bronze alloy containing phosphorus or the like.

While certain specific embodiments of an arch supporting structure for shoes have been dis-

closed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention other than as defined by the scope of the appended claims.

What is claimed is:

1. In footwear, an arch supporting device comprising a plurality of arched leaf spring elements, means for securing the forward ends of said elements to the sole of the footwear in spaced relation, said means, including longitudinally extending channels fixed to said sole and slidably receiving said forward ends, a heel plate, and means for securing the rear ends of said leaf spring elements to said heel plate.

2. In footwear, an arch supporting structure comprising a pair of arched leaf spring elements, independent means for securing the forward ends of the leaf spring elements to the sole of the footwear in spaced relation to each other, said means, including longitudinally extending channels fixed to said sole and slidably receiving said forward ends, a heel plate, and means for securing the rear ends of said leaf spring elements to said heel plate.

3. In an article of footwear, an arch supporting structure comprising a pair of arched elongated flat leaf spring elements, independent means for securing the forward ends of the spring elements to the sole of the article in spaced relation to each other, each spring element having an inwardly directed portion at its rear end, each inwardly directed portion being formed with a notch, a heel plate overlying said inwardly directed portions, and means passing through said heel plate and lockingly engaging the notches.

4. In an article of footwear, a bottom sole element and an upper sole element, and an arch supporting structure disposed between said bottom sole element and said upper sole element comprising a pair of elongated arched leaf spring elements, means for securing the forward ends of the spring elements to said bottom sole element in spaced relation to each other, each spring element having an inwardly directed end portion formed with a notch, a heel plate overlying the inwardly directed portions, and a common means engaged in the notches of the spring elements for securing said spring elements to the heel plate, said end portions being in overlapping relation.

5. In an article of footwear, an arch supporting structure comprising a pair of arched elongated flat leaf spring elements, independent means for securing the forward ends of the spring elements to the sole of the article in spaced relation to each other, said means, including longitudinally extending channels fixed to said sole and slidably receiving said forward ends, each spring element having an inwardly directed portion at its rear end, each inwardly directed portion being formed with a notch, a heel plate overlying said inwardly directed portions, and means passing through said heel plate and lockingly engaging the notches.

6. In an article of footwear, a bottom sole element and an upper sole element, and an arch supporting structure disposed between said bottom sole element and said upper sole element comprising a pair of elongated arched leaf spring elements, means for securing the forward ends of the spring elements to said bottom sole element in spaced relation to each other, each spring element having an inwardly directed end portion formed with a notch, a heel plate overlying the inwardly directed portions, and a common means engaged in the notches of the spring elements for securing said spring elements to the heel plate, said end portions being oppositely bevelled and overlapped.

7. In an article of footwear, a bottom sole element and an upper sole element, and an arch supporting structure disposed between said bottom sole element and said upper sole element comprising a pair of elongated arched leaf spring elements, means for securing the forward ends of the spring elements to said bottom sole element in spaced relation to each other, said means, including longitudinally extending channels fixed to said sole and slidably receiving said forward ends, each spring element having an inwardly directed end portion formed with a notch, a heel plate overlying the inwardly directed portions, and a common means engaged in the notches of the spring elements for securing said spring elements to the heel plate, said end portions being in overlapping relation.

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