Sept. 11, 1934. W. W. ODELL 1,972,899

SHOE AND FOOT SUPPORTING DEVICE

Filed Oct. 8, 1931

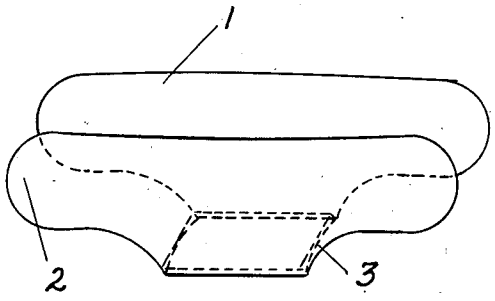


Fig-1

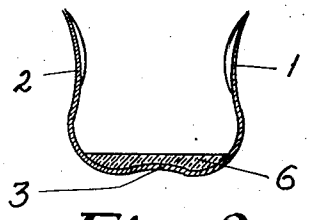


Fig-2

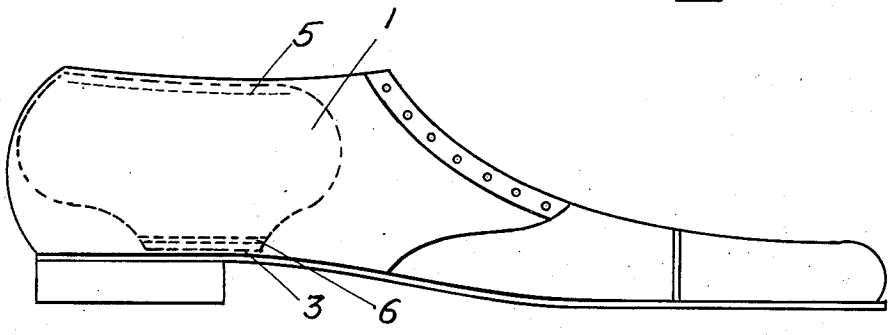


Fig-3

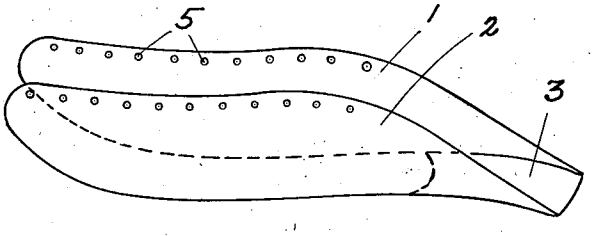


Fig-4

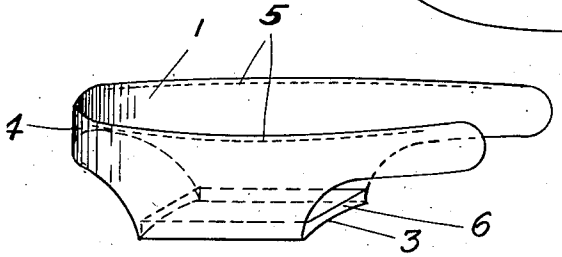


Fig-5

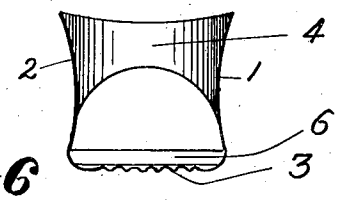


Fig-6

INVENTOR.

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Patented Sept. 11, 1934 1,972,899

UNITED STATES PATENT OFFICE

1,972,899

SHOE AND FOOT-SUPPORTING DEVICE

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Application October 8, 1931, Serial No. 567,607

13 Claims. (Cl. 36—8.5)

My invention relates to a shoe and foot-supporting device, and in particular to a means, adapted to be fitted into and incorporated as a part of a shoe suited for use by humans, whereby a snug fit with support about the ankles is provided. It relates to a piece of spring metal so designed, shaped and located in a shoe that the application of downward pressure, such as by the weight of the wearer when standing in said shoe causes the application of a supporting pressure to the sides of the shoe adjacent and below the ankle.

One of the objects of my invention is to eliminate some of the foot-troubles commonly resulting from a lack of support of feet adjacent the ankle. Another object is to provide a means whereby the supporting force is the greatest at the time it is most needed, namely when one's full weight is on the shoe and least when one is in repose and no weight is applied to the shoe. This variation in the application or intensity of the supporting force tends to cause an exercising of the foot muscles which is desirable in preventing arch trouble. My device may be made a part of an arch-support or rather may include an arch support as a part thereof.

Figure 1 is a perspective elevation of one form of the spring-tension element adapted to be incorporated in a shoe.

Figure 2 is a sectional view of the same element shown in perspective in Figure 1.

Figure 3 shows in elevation a shoe having the spring element incorporated therein.

Figures 4, 5 and 6 are modified forms of the spring-tension element.

The numbering system is identical in the various figures.

All of the figures illustrate my invention rather diagrammatically.

In Figure 1, the side wings 1 and 2 are continuous through the base plate 3 which is somewhat arched so that downward pressure on 3 causes an inward pressure on 1 and 2, that is, it causes the upper portions of them to tend to come together. The wings 1 and 2 may be formed according to the contour of one's foot and need not be shaped as shown in Figures 1 and 2. A fibrous cushion element 6 is usually located above the base plate 3 which may be fastened to said plate.

In Figure 3 the spring-tension element is shown in place in a shoe, the base plate being over the forward portion of the heel. That element may be so designed that the base plate is located at the ball of the foot or just to the rear thereof as in Figure 4 or it may be located elsewhere such as at the arch or at the middle or back portion of the heel.

In Figure 5 the wings 1 and 2 are connected at the rear end by 4 with which it is made substantially continuous. In this modification the rear portions of the wings are subject to less movement by reason of spring tension exerted by the spring element 3 than the forward portion of said wings.

I find that with many individuals, using shoes without a snug support adjacent the ankles, there is a tendency for the foot to sag to one side or the other (right or left) and for the arches to fall. I claim to alleviate these troubles by the use of the properly shaped spring-tension element located in a form-fitting position in the shoe.

One of the features that I believe to be new and novel in connection with a foot support is the arched bottom or base plate shown at 3 in the various figures. This may be made of material having such a spring tension as to act or function as a cushion but in any case it is adapted to be the means for causing the wings 1 and 2 to cling to the foot giving it support when a downward pressure is applied to said plate such as when one walks or stands in shoes fitted with the spring-tension element. A downward pressure applied to 3 tends to flatten 3 and this in turn pushes the wings 1 and 2 further apart at the base but tends to bring them closer together at the top. This is a desirable feature. The amount of arching of base 3 may be that found to be most satisfactory for a particular case. Base plate 3 may be corrugated as shown in Figure 6 or have other shape but it is desirable that the shape be such that a downward pressure on said plate will cause an inward supporting pressure on the upper portion of wings 1 and 2 of the various figures.

The spring-tension element is adapted to be fitted into a shoe, preferably as a permanent part thereof; it is adapted to be sewed to the leather or other flexible portion of the shoe. Holes are shown at 5 of the figures whereby the spring-tension element may be stitched to the shoe. Although the holes as shown are along the upper portion of the wings it is understood that they may be located elsewhere. In fact the element may be made of metal having a portion so thin that it can be stitched to the shoe without any perforations being made prior to stitching. It preferably should be located in the shoe in such a manner that the base plate 3 is covered with

a fibrous or elastic material such as leather or rubber. When incorporated in a shoe at the time said shoe is made the fibrous or elastic material need not be a part of the device but rather a part of the shoe in which the base plate is fitted; when the device is to be used in shoes not originally equipped with the device it is commonly desirable to have the cushion member fastened to the top of the base plate. The entire metal portion of the element may be covered with leather, and preferably is so covered when the element is intended for use as an adjunct to shoes not originally equipped therewith. Other material may be substituted for the leather covering, for example, cloth or synthetic leather.

It is understood that the wings of the element may be connected at the back as shown in Figures 5 and 6. The wings normally and preferably are thinner at the top than at the portion near the base. Thus my device may be used chiefly for supporting the foot or massaging the muscles, or chiefly as a means of causing the shoe to cling closely to the foot adjacent the ankle.

Other shapes and forms of a spring-tension element can be conceived wherein my invention can be practiced and therefore I do not limit myself to those indicated by the figures. The tension may be stronger on one of the wings than on the other when so desired; it is commonly desirable to have the wing adjacent the wall of the shoe next to the inner side of the foot heavier, or under greater spring tension, than the outer wing.

When the spring-tension element is in place in a shoe it reinforces the walls of the shoe adjacent but below the ankle and lends support to the ankle when the shoe is worn, producing in effect a snug fit at the ankle. The whole element is preferably made of spring metal and the wing portions are preferably sufficiently thin to be flexible. The beneficial effect on the foot of arching or corrugating the base plate is aided by the use of the leather or rubber cap shown at 6 in Figures 2, 3, 5, and 6.

The base plate may be arched upwardly or downwardly, that is, it may be convex or concave or it may be circularly arched, that is, domed. It may be so constructed with respect to the wing-elements that it fits into place in a shoe at the heel, at the arch or in front of the arch. Likewise the wing-elements may be located entirely adjacent the back walls of the shoe as in Figure 3 or they may extend further forward as indicated by Figure 4.

I believe that it is basically new to incorporate as a part of a shoe a spring-tension element adapted to apply a supporting force to the ankle or parts adjacent thereto by virtue of one's weight applied thereto as by standing or walking. The base plate may itself be an arch support, the upwardly extending wings functioning chiefly to support the foot and strengthen the muscles.

It is understood that other materials than metal may be used in the construction of my device, the essential requirement being that the material used should be capable of exerting spring-tension force under the described conditions. Although the figures only diagrammatically portray my invention, the wings, in the preferred form, are shaped to be substantially form fitting adjacent but below the ankle.

Special attention is called to the modification shown in Figure 5. In this example the force of spring tension is exerted by the base plate 3 and also, to a predetermined extent by the rear portion 4. The extent to which spring tension is exerted by 4 depends partly upon the tension put into it when shaped; it also depends upon the nature of the material out of which it is forged. For example, when made of spring metal or equivalent it may be so shaped that it exerts continuously a slight tension on the wings in their upper portions tending to bring them together; this tension may be greater in one portion of the wings than another according to design, shape and thickness of the material of which the wings and 4 are comprised. Additional spring tension is exerted on the wings when a downward pressure is exerted on base plate 3. The force of spring tension on the wings applied by 4 is usually less at the front portion of said wings than towards the rear; the inward tension applied by 3 is greater at the upper portion than at the base of said wings. These two forces are coordinated to produce the desired supporting effect.

Having described my invention so that one skilled in the art can practice it, I claim:

1. A foot-supporting device, adapted for use in a shoe, comprising, a spring-tension element, said element comprising a base-plate adapted to contact the bottom of said shoe at substantially one end of said shoe only being upwardly transversely arched at said end when in position in said shoe, and two wing-elements substantially continuous with said plate adapted to contact the opposite side-walls of said shoe extending upwardly and longitudinally toward the other end of said shoe, said plate being so shaped that the downward application of a force thereon causes the upper portion of said wing-elements to press inwardly.

2. A foot-supporting device adapted for use in a shoe, comprising, a spring-tension element, said element comprising substantially an upwardly transversely arched spring-cushion base-plate adapted to contact the sole of said shoe as a bridge widthwise across it at substantially one end of said shoe only when inserted in position in said shoe, having two wing-elements continuous with said plate adapted to contact the opposite side-walls of said shoe, one at each of said side-walls, said plate being so shaped that the downward application of a force thereon causes the upper portion of said wing-elements to press inwardly.

3. A foot-supporting device adapted for use in a shoe, comprising, a spring-tension element, said element comprising a spring base plate adapted to contact the sole of said shoe having a wing-element on each of two opposite sides continuous therewith adapted to contact the respective walls of said shoe, said plate being arched so that the downward application of a force thereon causes the upper portion of the wing-elements to press inwardly, said wing elements having their upper rear portions connected at the heel in said shoe.

4. A foot-supporting device adapted for use in a shoe, comprising, a spring-tension element comprising a base plate adapted to contact the sole of said shoe having an upwardly-extending wing-element on each of two opposite sides thereof continuous therewith adapted to contact the respective walls of said shoe in a foot-form position, said plate being arched so that the downward application of a force thereon causes the upper portion of the wing-elements to press inwardly, said wing-elements having their upper rear portions connected to form an arch at the heel in said shoe, said arch being adapted to exert a force

on said wings by virtue of spring tension tending to hold them in a fixed position.

5. In a foot-supporting device adapted for use in a shoe, comprising a spring-tension element having a base-plate adapted to contact the bottom of said shoe at substantially one end of it only when fitted in position in said shoe with two wing-elements extending upwardly each from opposite sides thereof, a base-plate spring-element arched upwardly transversely between the lower portion of said wing-elements at said end of said shoe.

6. In a foot-supporting device adapted for use in a shoe, comprising a spring-tension element having a single base plate adapted to fit substantially into one end only of said shoe adjacent the bottom thereof having two upwardly extending wing-elements one adjacent each of two opposite sides thereof adapted to extend toward the remote end of said shoe, a transversely corrugated base-plate integral with said wing-elements adapted to exercise spring tension on said wing elements when a weight is applied thereto.

7. In a foot-supporting device adapted for use in a shoe, comprising a spring-tension element having a base-plate adapted to fit into one end of said shoe only forming a cushion in the bottom of said shoe at said end with two upwardly extending wing-elements one on each of two opposite sides thereof adapted to extend towards the other end of said shoe, flexible wing-elements continuous with said base plate which plate is substantially an upwardly transversely arched cushion element adapted to exercise the force of spring tension on said wing-elements when a weight is applied thereto.

8. A shoe having incorporated therein as a part thereof a spring-tension element comprising an upwardly transversely arched spring base-plate located substantially at one end thereof only adjacent the shoe-bottom with two wing-elements integral therewith extending upwardly therefrom part way towards the other end thereof one adjacent each of two opposite sides thereof, said wing-elements contacting the shoe-walls, said base-plate contacting the sole and adapted to exercise the force of spring-tension on said wing-elements when a weight is applied thereto.

9. A shoe having incorporated therein a spring-tension element comprising a spring base-plate located substantially at one end thereof only adjacent the insole adapted to function as an arch support having wing-elements extending upwardly therefrom towards the other end thereof on either side adjacent the shoe-walls, said base plate being substantially continuous with said wing-elements and upwardly arched between their bases transverse the bottom, the whole being in spring tension.

10. A shoe having incorporated therein substantially as a part thereof, a spring tension element comprising an upwardly transversely arched base-plate located substantially at one shoe-end only with two upwardly extending wing-elements continuous therewith reaching towards the other end, one adjacent each of two opposite sides thereof, said wing-elements contacting the shoe-walls, said base-plate substantially contacting the insole and adapted to exercise the force of spring-tension on said wing elements tending to bring them together when a downward pressure is applied to said arched plate.

11. A shoe having incorporated therein substantially as a part thereof a spring-tension element comprising a spring base plate adapted to contact the sole thereof having a wing-element on each of two opposite sides continuous therewith adapted to contact the respective shoe-walls, said plate being arched so that the downward application of a force thereon causes the upper portion of said wing-elements to press inwardly, said wing elements having their upper rear portions connected to form an arch at the heel.

12. A shoe having incorporated therein a spring-tension element adapted to function both as a metatarsal arch support and a support for the shoe-walls, comprising, a spring base plate located at a forward portion only of the shoe-insole forming substantially a cushion arch, having a wing-element on each of two opposite sides extending upwardly and towards the rear in contact with the shoe-walls, said plate being upwardly arched so that a downward pressure thereon causes said wing elements to press inwardly.

13. A foot supporting device adapted for use in a shoe, comprising a spring-tension element, said element fitted in place in said shoe comprising an upwardly transversely arched spring located substantially at one shoe-end only adjacent the floor of said shoe having two upwardly projecting wing-elements one on each of two opposite sides contacting the shoe-walls extending towards the other end of said shoe, said arched spring being so shaped that a downward pressure thereon exerts an unequal tension on said wings being greater on one than on the other causing them to press inwardly, said wings being continuous with said arch.

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