Aug. 9, 1949. F. E. MORROW ET AL 2,478,664

SANDAL

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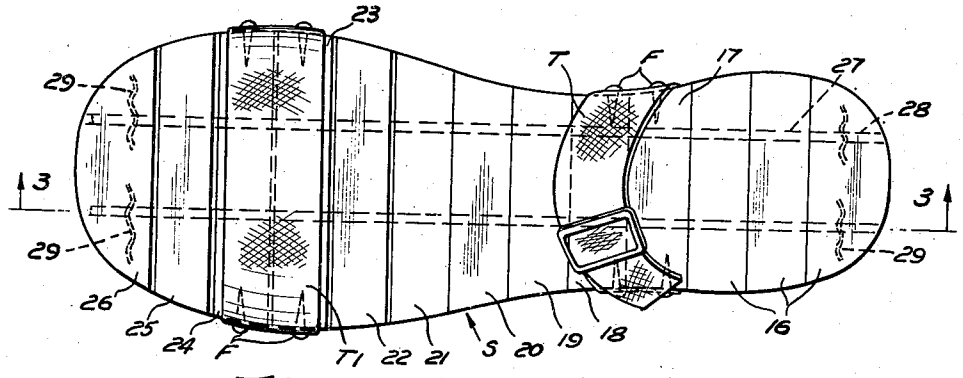


Fig. 1

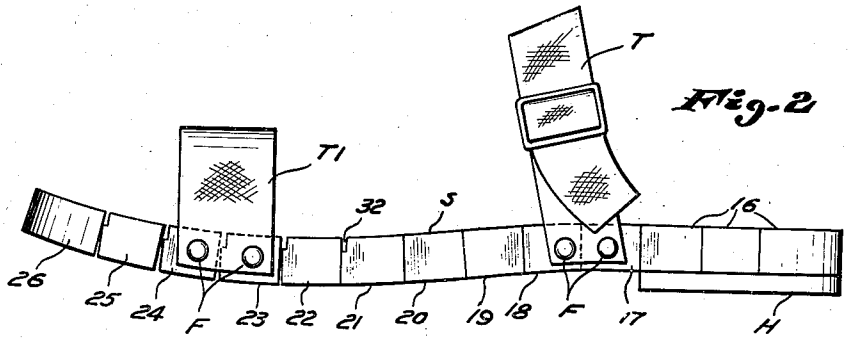


Fig. 2

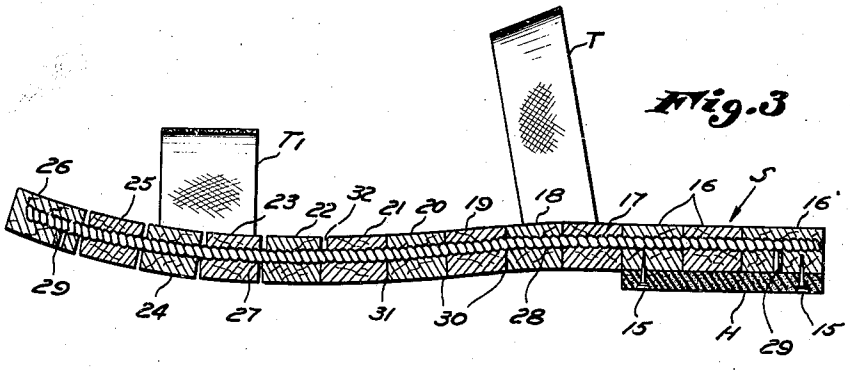


Fig. 3

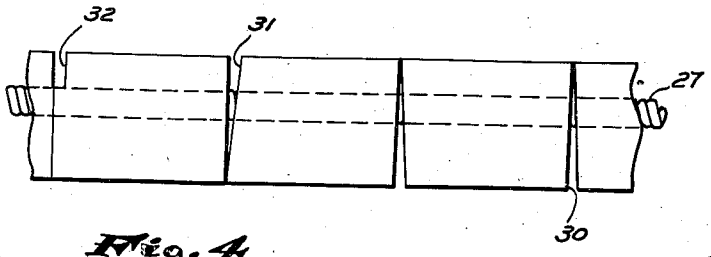


Fig. 4

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SANDAL

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2 Claims. (Cl. 36—33)

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Our invention relates to footwear, and more particularly, although not necessarily, to sandals especially adapted for beach wear, and wherein the sole is made up of articulated sections to lend flexibility thereto.

It is a purpose of our invention to provide a sandal having a sole which is characterized by the construction of and the means for connecting the articulated sections, which give and maintain a top side contour conforming to the natural contour of the bottom of the foot when standing and the varying contours assumed in walking, thus providing a sandal which forms an adequate support for the foot, and yet possesses the flexibility and comfort of a leather shoe.

It is also a purpose of our invention to provide a sole for sandals in which the connecting means for the sole sections comprises coiled springs secured under tension to so yieldingly connect the articulated sections that the sole as a whole possesses a resilient flexibility that permits it to flex with and under the normal bending movements of the foot in walking, but restores it to an adequate foot supporting position when standing. As a consequence, the sole constantly conforms to one's foot contour so as not to afford any impediment to one's walking in the normal manner.

We will describe only one form of sandal embodying our invention, and will then point out the novel features thereof in claims.

In the accompanying drawings:

Fig. 1 is a view showing in top plan one form of sandal embodying our invention.

Fig. 2 is a view showing the sandal in side elevation.

Fig. 3 is a longitudinal sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged fragmentary side elevation view of the sandal sole.

With specific reference to the drawings, our invention in it present embodiment comprises a sandal having a sole, generally indicated at S, with any suitable means for attaching the sole to the foot of the wearer, such means, in the present instance, comprising an instep strap T and a toe strap T1, each of which is secured to the longitudinal edges of the sole by suitable fastening members F.

The sole S is made up of a multiplicity of articulated ribs or sections constructed of wood, plastic, or other suitable material having the required wearing properties, and a heel preferably formed of rubber which is secured to the

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sole by nails 15 or other suitable fastening members. The heel is adapted to be used only where the sections forming the heel of the sole are of the same thickness as the remaining sections of the sole.

To facilitate description of the mode of operation of the sandal when in use, I shall separately designate the sole sections constituting the heel, the shank, and the toe supporting portions for a foot. The heel supporting portion may be made of one or more sections 16, while the shank portion is made up of sections 17 to 21 inclusive. The toe supporting portion is made up of sections 22 to 26 inclusive.

All of the sections of the sole are joined one to the other by means providing articulation between the sections, and this means, in the present instance, comprises two or more coiled contractile springs 27. Each spring is in the form of a coiled wire, preferably a piano wire to provide the necessary strength, durability, and resiliency, and the two springs extend through parallel bores 28 formed in the sections. It will be particularly noted that these bores 28 are nearer the top of the sole sections than the bottom so that the springs are correspondingly situated, and for a purpose to be described hereinafter.

Each spring 27 is of such length as to extend transversely through all of the sole sections, with its ends terminating substantially flush with the outer edges of the outermost toe and heel sections. Such ends are secured in the aforesaid sections by corrugated brads 29, or other suitable fastening members, which are driven into the under sides of the sole sections to bite into the spring ends and thus secure the latter against longitudinal movement within the sole. In practice, it is essential that the springs 27 be associated with the sole sections as to be constantly under tension so as to urge the sections toward each other, and to this end the springs originally are longer than the sole so that by first securing one end of the springs in the toe section 26, for example, by the use of the brads 29, the other ends will project from the heel of the sole so that they can be pulled and the springs placed under tension. While the springs are under tension the brads 29 are applied to the heel section thus maintaining the springs under tension, and, following which, the projecting ends of the springs are cut off flush with the surface of the heel section.

In order that the sole S may have the general curvature of the bottom of the foot so as to support the foot when the wearer is standing, and

also to allow the requisite flexing of the sole so that it is free to conform to the bending movements of the foot in walking, the shank sections 18 to 20 have their confronting edges slightly beveled in opposite directions transversely to normally leave narrow gaps between the sections at the under sides thereof. The confronting edges of the sections 20 and 21 are beveled in the same manner as the other sections, but to a greater degree as indicated at 31, in order that the contour of the sole at this point properly merges into the toe supporting portion of the sole. The sole sections forming the toe supporting portion of the sole, as well as the forward edge of the section 21, are all formed with coextensive longitudinal grooves of angular form to provide coextensive recesses 32. These recesses allow turning movement of the sections 22 to 26 in various degrees to permit the toe supporting portion of the sole, to conform to the bending movements of the toes of the wearer in walking.

In practice, the springs 27 being under tension as associated with the sole sections, urge such sections toward each other, and because they extend through the sections adjacent the upper sides thereof, they exert pulling forces transversely of the sections which, by virtue of the beveled edges 30 and 31 and the recessed edges 32 cause the sole to normally assume the general curvature of the bottom of the foot of the wearer. Thus, normally the sole provides adequate support for the foot of the wearer when in a standing posture.

When the wearer is walking the resilient connections between the sections 17 to 26 provided by the springs 27, allow such flexing of the sole that it yields to and follows the bending movements of the foot, as not to interfere with or offer any discomfort to the wearer when walking.

In this sole flexing movement the recessed edges 32 allow upward turning movement individually of the sections 22 to 26, and to a degree than would otherwise be possible.

Because of the constant tension exerted by the springs on the sole sections, the sole is urged to the normal curvature shown in Fig. 2, and thus when the sole is not subjected to any bending movements as in walking, it automatically returns to its normal curvature to afford adequate support for the foot when standing. As a result a sandal constructed in accordance with our invention enables the wearer to walk or stand in comfort, and the sections can at no time pinch the flash of the wearer because of the constant tendency of the sections to assume their normal positions under the action of the springs, and thus close the joints between the sections in the upper sides thereof in advance of lowering movements of the foot.

Although we have herein shown and described only one form of sandal embodying our invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of our invention and the spirit and scope of the appended claims:

We claim:

1. A sandal having a sole, including: a multiplicity of transverse sections arranged in side to side relation, those sections forming the shank portion of the sole being beveled at their confronting sides at substantially the same angle but in opposed directions transversely thereof, those sections forming the toe and ball portions of the sole each having one side flat and the other side with a recess extending longitudinally thereof to form an edge at a point above the major axis of the sole providing a fulcrum about which the next section is adapted to pivot; and a plurality of coiled springs extending loosely through all of the sections at points above the major axis of the sole, and secured at their ends to the end sections of the sole so as to be under tension, whereby adjacent toe and ball sections are urged toward each other along lines above the major axis of the sole, and, hence, upwardly about said fulcrums to give normally an upward curvature to the ball and toe portions of the sole.

2. A sandal having a sole, including: a multiplicity of transverse sections arranged in side to side relation, with those sections forming the toe and ball portions of the sole having confronting sides one of which is formed with an edge at a point above the major axis of the sole to provide a fulcrum about which the adjacent section is adapted to pivot upwardly; and a plurality of coiled springs extending loosely through all of the sections at points above the major axis of the sole and secured at their ends to the end sections of the sole so as to be under tension, whereby adjacent toe and ball sections are urged toward each other along lines above tthe major axis of the sole, and, hence, upwardly about said fulcrums to give an upwardly curved contour to the ball and toe portions of the sole.

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