SLOTTED SOLE SANDAL

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1. This invention relates to sandals and particularly to slotted sole sandals having a hinged sole retained on the foot by means of straps.

An object of this invention is to provide a sandal having a hinged sole adapted to flex with the foot and which is comfortable and durable.

Another object is to provide a sandal having a hinged sole which may be manufactured at low cost.

Another object is to provide a sandal having a sole hinged to pivot freely without pinching or irritating the foot.

A further object is to provide a sandal having straps which comfortably retain the sandal on the foot.

Still a further object is to utilize straps for retaining a sandal on the foot without "cutting" the foot with the strap edge.

Other objects and advantages will be pointed out in, or be apparent from, the specification and claims, as will obvious modifications of the single embodiment shown in the drawings, in which:

Fig. 1 is a top view of a sandal for the right foot;

Fig. 2 is a side elevation of the sandal as worn on the foot shown in dotted lines;

Fig. 3 is a top view of the sandal with the straps removed;

Fig. 4 is a side elevation of the sandal with the straps removed;

Fig. 5 is a bottom view of the sandal; and

Fig. 6 is a vertical section through the hinge on line 6—6 in Fig. 4.

Referring to the drawings in detail, Fig. 1 shows the top of a completed sandal with the straps in the position they occupy when the sandal is worn on the foot as shown in dotted lines in Fig. 2. The sole 10 of the sandal is preferably constructed of wood having its grain running along its longitudinal axis (toe to heel) for reasons which will appear hereinafter. The sole consists of three pieces hinged together to flex with the foot. The most forward portion 12 underlies the toes with the ball of the foot resting on the center section 14 and the remainder of the foot on the heel portion 16. As the length of the sole is varied for different foot sizes, the proportions of the sections must be maintained in order to avoid irritation by the hinges and to insure comfort.

The hinge construction between the three sole pieces is best shown in Figs. 3 through 6. The center section 14 is provided with vertical transverse walls 18, 20 from which a plurality of spaced hinge lugs 22, 24, respectively, project. Lugs 22 interfit with spaced lugs 26 formed in the heel portion 16. It will be noted that the hinge lugs have curved faces to permit free movement of the parts with respect to each other as they rotate about hinge pin 28 which passes through the interfitting lugs and terminates in the heavier or wider lugs 26 adjacent the inner and outer edges of the shank. The hinge lugs 26 on the heel portion 16 are undercut at 30 for reasons which will appear hereinafter.

Hinge lugs 24 on the forward wall of center section 14 similarly interfit with spaced hinge lugs 32, undercut at 38, on the toe portion 12. These interfitting lugs are adapted to pivot on hinge pin 34 which terminates in the wide lugs 35 on the toe section adjacent the inner and outer edges of the shank. Further reference to Fig. 6 will also show that pin 34 may be retained in position in the interfitting lugs by plug 36 to obtain a matching finish on the exterior of the sandal while utilizing a metal pin.

As the sole of the sandal flexes there is complete freedom of movement of the component parts to insure the utmost in comfort. The undercutting of the hinge lugs 26, 32 on the heel and toe portions 16, 12 at 30 and 38 prevents the lugs from contacting the surface under the sandal. Thus there is no frictional resistance to flexing the sandal as a result of the hinge lugs rubbing over the surface under foot. While the hinge lugs on the center section 14 are shown as being slightly undercut, this is merely a manufacturing expedient. These lugs cannot scrape the undersurface since flexure of the sandal raises the center section from the surface as or before the center section flexes with respect to the toe portion.

While frictional resistance due to the hinge lugs scraping on the undersurface has thus been avoided, it would appear at first blush that the relatively movable parts of the sole would tend to pinch the foot. It has been found, however, that positioning the hinge pin above the medial plane of the sole minimizes such pinching by reducing relative movement of the upper sole surfaces for a given degree of rotation of the parts.

This is shown in Fig. 6 where the distance a from the bottom of the sole to the centerline of the pin is greater than the distance b from the centerline to the top of the sole.

Another feature resulting in complete foot comfort is the manner in which the forward hinge lugs 24 on the center section 14 are offset toward the inner edge of the sole with respect to the lugs 22 on the rear face of the center section. Moving the interfitting lugs 24 toward the inner edge of the sole in this manner reduces ir-
ritation of the muscle running from the big toe to the ball of the foot and additionally serves to conform the shape of the hinge portion of the sole between the toe section 12 and the center section 14 to the shape of the sole.

Care must be taken to leave ample material on the toe and heel portions adjacent the inner and outer edges of the sole to receive the ends of the corresponding hinge pin. As pointed out above, the grain of the wood runs generally from heel to toe, and if the ends of the hinge pin were not anchored in the heavy material adjacent the inner and outer edges of the heel and toe portions, the pin would tear through the hinge lugs. Running the grain crosswise would not eliminate this trouble since the hinge lugs would then snap off at the roots. The center section 14, however, need not be provided with such wide lugs since the stress acts at a slight angle to the grain and the pin neither tears out nor shears the lugs. Thus this structure completely eliminates any tendency for the hinge pins to tear out of or to shear the hinge lugs. The resultant straight vertical transverse walls on the center section permit simplified manufacture of the center section and material cost reductions.

The sandal is retained on the foot by means of two straps, one fitting over the heel and angle and the other fitting over the forward portion of the foot as shown in Figs. 1 and 2. The heel portion 18 is provided with a rearwardly inclined transverse slot 40 through which strap 42 passes. One end of the strap passes through a pair of slots 44, 46 on the strap to frictionally retain a loop in the lower part of the strap. This permits the strap to be adjusted to the particular heel so that the cross-over point generally denoted 48 lies over the heel as shown. The ends of the strap are then brought around the angle and buckled to firmly hold the heel to the sole. Thus strap 42 generally assumes a figure 8 shape with the lower loop passing through slot 40 and fitting over the heel and the upper loop encircling the ankle. The rearwardly inclined slot 40 causes the lower loop of strap 42 to form a pocket receiving and lying flat against the heel, thus avoiding any "cutting" of the heel.

The forward part of the foot is retained on the sandal by means of strap 50. This strap passes through rearwardly inclined transverse slots 52, 54, 56 in the heel, center, and toe portions of the sole. The forward inclination of the slots is particularly advantageous in the case of slots 54, 56 in the center and toe portions where they slightly twist the strap so that the strap portions adjacent the sole will be substantially parallel to the edge of the sole and contact with the foot over the full strap width. If these slots were horizontal, the rear edge of the strap would lie closer to the sole of the foot than would the forward edge, resulting in contact with the foot localized at the mid-edge of the strap. Thus the provision of forwardly inclined slots generally shapes a pocket com-

fortably receiving the foot and conforming to the foot. It will be noted that the buckle on strap 50 permits adjustment of the total length of the strap. This results in the strap adjusting itself to the individual foot since the strap is free to slide in the slots 52, 46.

Although but one embodiment of the present invention has been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. A sandal having a sole having toe and ball portions the upper and lower faces of which are generally parallel, a plurality of transverse forwardly and downwardly inclined slots through said sole in the toe and ball portions thereof, and a strap passing through said slots and diagonally over the foot, the inclination of said slots serving to twist the strap to lie flat against the foot.

2. A sandal having a sole including toe, ball, shank and heel portions, said heel portion being thicker than the toe and ball portions, and the upper and lower faces of the toe and ball portions being generally parallel, the upper face of the shank portion sloping upwardly and rearwardly, a plurality of transverse slots in said toe and ball portions inclined downwardly and forwardly, a transverse slot in said shank portion inclined forwardly and downwardly, and a strap passing through said slots and diagonally over the foot, the ends of the strap being substantially interconnected to form a pocket receiving the toe, ball and instep portion of the foot and the inclination of said slots serving to twist the strap to lie flat against said portions of the foot.

CARL A. PITZ.

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