Aug. 1, 1961 N. HACK 2,994,326

ARCH CRADLE UNIT STRUCTURE

Filed June 27, 1960

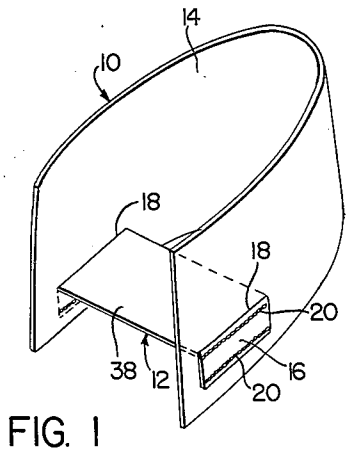

FIG. 1

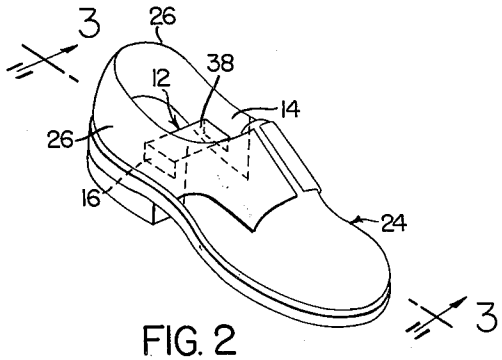

FIG. 2

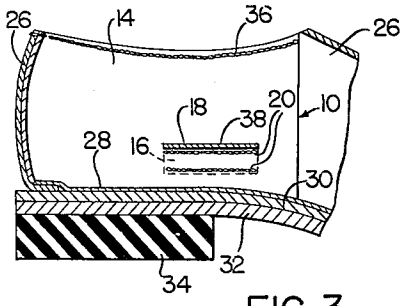

FIG. 3

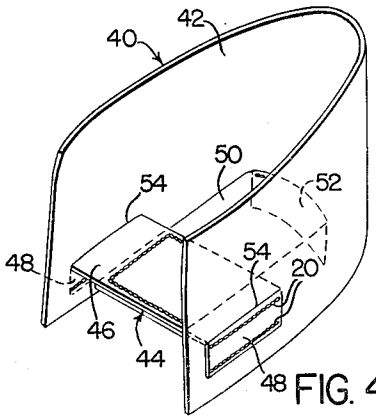

FIG. 4

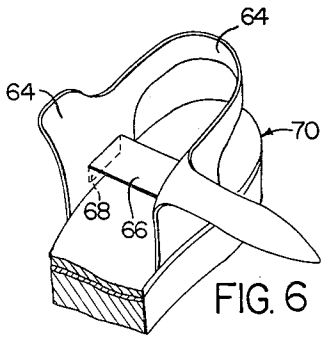

FIG. 6

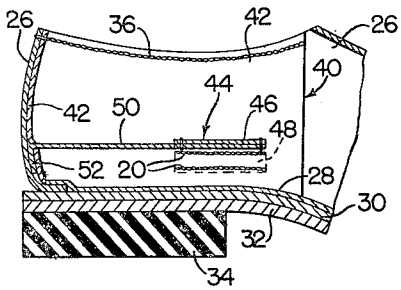

FIG. 5

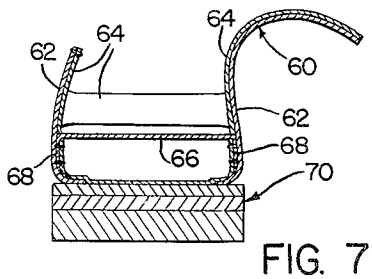

FIG. 7

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ARCH CRADLE UNIT STRUCTURE

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This invention relates to an arch cradle unit structure and more particularly to such a structure as can be readily embodied into either a completed shoe or into a shoe in process of being fabricated.

The invention heredisclosed is related to the disclosure in Hack U.S. application No. 855,827 filed November 27, 1959 and issued as U.S. Patent No. 2,963,800.

The invention involves an arch cradle strip of resilient, cushioning, supportive material disposed transversely of the shoe, and in a second form both transversely and longitudinally of the shoe, above the insole within the area of the longitudinal inner and outer arches of the foot and rearward of the transverse arch, i.e. in the area of the heel breast line. The arch cradle strip is arranged with a central arch cradle bridging portion in the open area of the shoe and receiving the foot arch, and two side extensions or flanges at the ends of the strip which are secured to a quarter liner, forming a complete arch cradle unit structure. The unit can then be placed in any shoe, be it completed or in process of fabrication. The quarter liner is stitched in place along and adjacent the top edge of the upper structure, adhered to the side and rear walls of the upper structure and to the insole. The unit is completely independent of the shoe prior to insertion and attachment and can be affixed by any competent shoe repairman.

It is an object of the invention to provide an arch cradle unit structure which can be attached to a shoe. Another object is the provision of a structure that is independent of a shoe, whether completed or in process of fabrication. A further object is to provide a structure that is easily and simply affixed to a shoe.

These and additional objects of the invention and features of construction will become more readily apparent from the disclosure and description given below, in which the terms employed are used for purposes of description and not of limitation. Reference is made to the drawing annexed hereto forming an integral part of this specification, and in which

FIG. 1 is a perspective view of a basic embodiment of the inventive arch cradle unit structure.

FIG. 2 is a perspective view of a shoe containing the structure of FIG. 1.

FIG. 3 is a fragmentary vertical longitudinal sectional view taken substantially on line 3—3 of FIG. 2.

FIG. 4 is a perspective view of a modification of the unit structure shown in FIG. 1.

FIG. 5 is a fragmentary vertical longitudinal sectional view, similar to FIG. 3, showing the unit structure of FIG. 4 applied in a shoe.

FIG. 6 is a perspective view of the rear portion of a sandal having an upper unit structure embodying the invention.

FIG. 7 is a vertical transverse sectional view through the arch cradle strip shown in FIG. 6.

As shown in the several views of the drawing, and particularly in FIGS. 1, 2 and 3, the arch cradle unit structure **10** comprises an arch cradle strip **12** and a shoe quarter liner **14**. The strip **12** is fabricated from an elastic band having rubber or plastic threads interwoven with textile or fabric threads, such as goring. A soft resilient leather or leatherlike material may used. Synthetic yarns and woven materials or non-woven materials may also be used, if such materials furnish the desirable resilient cushioning and supportive characteristics heredescribed. An operative material is a closely woven cotton fabric elastic band having rubber fibers or threads interwoven in the fabric of the band. The quarter liner is preferably fabricated of a fine leather, leatherlike, or closely woven fabric material, suitable for attachment to a shoe by sewing and adhesives.

The arch cradle strip **12** has its ends **16**, **16** passed through slots **18**, **18** in the quarter lining at each side thereof, the ends being turned down and secured by stitching **20** to the quarter lining **14** on the outer side thereof. In certain cases, the arch cradle ends or flanges **16**, **16** are attached to the inside surface of the quarter liner, without the necessity of slotting the latter, by stitching **20**. The unit structure **10** is completed with the assembly of the arch cradle strip **12** to the quarter lining.

As the unit structure, it can now be assembled to a completed shoe or one in the process of fabrication, the quarter lining in the latter instance supplying the quarter lining of the shoe and in the former instance doubling the quarter lining in a shoe. To affix the structure **10**, in either case, the outer surface of the lining or the inside walls of the shoe are coated with an adhesive and the unit structure adhered to the shoe upper structure. This is shown more clearly in FIGS. 2 and 3.

The shoe **24** is provided with an upper structure **26**, a shoe insole **28**, a shoe base **30**, and an outsole **32** and heel **34**. When inserted into the shoe structure, the quarter lining **14** is adhered to the side and heel walls of the upper structure **26** by an adhesive and stitched thereto along the top edge by stitching **36**, securing the unit structure **10** firmly in the shoe **24**. The arch cradle strip **12** has its bridging portion **38** disposed substantially in the area of the heel breast line, i.e. within the area of the longitudinal inner and outer arches of the foot and rearward of the transverse arch.

A modification of the unit structure **10** involves the addition of a rearwardly directed and conjoined heel support strip. In FIGS. 4 and 5 is illustrated an arch cradle unit structure **40** having a quarter lining **42** conjoined to and supporting an arch cradle strip **44** comprising a transverse bridging portion **46** provided with depending side flanges **48**, **48** at either end thereof, and a rearwardly directed, longitudinally central heel strip **50** having a depending end flange **52**. All of the side and end flanges **48**, **48** and **52** are fixedly secured to the quarter lining **42** by stitching **20**. The heel strip **50** is conjoined to the arch cradle bridge **46** by stitching or in any other suitable manner. The transverse arch cradle end flanges **48**, **48** are passed through slots **54**, **54** in the quarter lining **42** and secured on the outside of the lining, or alternatively secured on the inside of the lining, avoiding the need for slots.

When installed in a shoe, as shown in FIG. 5, the quarter lining is adhered to the shoe upper structure **26** and stitched along its top edge by stitching **36**, securing the unit structure **40** firmly in the shoe.

A construction similar to that described above and shown in FIGS. 6 and 7 involves the arch cradle unit structure for a sandal. The quarter strap unit **60** comprises the outer quarter strap wall **62**, the quarter strap lining **64**, the transverse arch cradle strip **66** having its outer ends **68**, **68** stitched to the lining **64** in depending relation to the strip **66** and below the plane thereof. The wall **62** and lining **64** are then stitched together at all edges into the unit **60**, ready for assembly with the sandal base structure **70** according to conventional practice.

It will be understood by persons skilled in the art to which the invention pertains that the unit structures **10**, **40** and **60** herein described and illustrated are applicable for use in either men's, women's or children's shoes.

The transverse arch cradle portions **38**, **46** or **66** are

elevated above the plane of the shoe insole a distance sufficient to provide a cradle for the foot when the foot is in the shoe. The downwardly directed and secured end flanges serve as piers for the bridging (arch cradle) therebetween. In the T-stem structure 40, the rearwardly directed heel strip 50 lies substantially in the plane of the transverse arch cradle bridge 46. The elasticity of the heel strip may be the same as in the transverse bridge, or it may be more or less elastic in nature depending upon the particular function which it is required to serve. In some cases, the heel strip may be slightly relaxed in order to provide a lower seating of the heel in the shoe and in ambulation.

The arch cradle strips above described and the quarter lining may also be fabricated of suitable and functionally acceptable plastics or rubber compositions, which can be assembled together by heat sealing or vulcanization. Such materials also lend themselves to die cutting and inexpensive fabricating processes. With such materials the T-stem arch cradle 44 can be fashioned from a single piece of material.

The advantages of the unit structures hereabove described include their application in shoe repair shops of arch cradle units in shoes that are either already in use or completed and ready for purchase. The unit structures can and should be sized for men's, women's and children's shoes. They are also applicable for use in heavy boots or other footwear constructed without quarter linings, the unit structures heredescribed supplying this feature of construction.

The arch cradle unit structures heredescribed provide additional or required support for the longitudinal arches of the foot. When installed in shoes, the arch cradle bridging portions provide resilient, cushioning supportive assistance to these arches. The bridging portions, and the T-stem when used, adapt themselves to every contour of the foot arch and heel without requiring any special design. The arch cradle bridges provide side elements, when the foot is in the shoe, above the plane of the foot arches that tend to oppose rotation of the foot, thus achieving a balancing corrective effect for persons having this tendency. The arch cradle bridging embodies a featherweight foot balancing feature that stabilizes the foot in the shoe without crowding the foot. Another advantage of the structure is to elevate the arch rearward of the metatarsal heads so that pivoting of the foot in ambulation is improved.

Having described the invention in its simplest terms, it is to be understood that the features of construction may be changed and varied in greater or lesser degree without departing from the essence of the invention defined in the appended claims.

I claim:

1. In an arch cradle unit structure for attachment to the upper structure of a shoe, a quarter lining for said shoe, an arch cradle strip having an arch cradle portion disposed in bridging arrangement between the walls of said lining, said strip having terminal flanges extending downwardly of the plane of said bridging portion and secured to said walls, whereby when said structure is attached and secured to said upper structure said arch cradle portion is disposed in a horizontal and substantially parallel plane above the insole of said shoe in the area of the heel breast line, said arch cradle portion providing a bridge between sides of said upper structure.

2. The structure defined in claim 1, and in which said terminal flanges extend through openings in said walls to the outside of said lining.

3. In an arch cradle unit structure adapted to be attached to the upper structure of a shoe, a quarter lining for said shoe, an arch cradle strip having an arch cradle portion disposed as a bridge between the side walls of said lining, said strip having terminal ends extending downwardly of the plane of said arch cradle portion and secured to said walls, whereby when said structure is attached and secured to said upper structure said arch cradle portion is disposed in a horizontal and substantially parallel plane above the insole of said shoe in the area of the heel breast line, said arch cradle portion providing a bridge between sides of said upper structure.

4. The structure defined in claim 3, and in which said terminal ends extend through openings in said side walls to the outside of said lining.

5. In an arch cradle unit structure adapted to be attached to the upper structure of a shoe, a quarter lining for said shoe, an arch cradle strip having an arch cradle portion disposed transversely as a bridge between the side walls of said lining and a heel portion conjoined to said arch cradle portion disposed longitudinally and rearwardly and between said arch cradle portion and the heel wall of said lining, said strip having terminal ends extending downwardly of the plane of said arch cradle and heel portions and secured to said walls, whereby when said structure is attached and secured to said upper structure said arch cradle and heel portions are disposed in a substantially horizontal and parallel plane above the insole of said shoe in the area of the heel breast line, said arch cradle and heel portions providing bridging between the sides and rear of said upper structure.

6. The structure defined in claim 5, and in which said terminal ends extend through openings in said side and heel walls to the outside of said lining.

7. In an arch cradle quarter strap unit structure for a sandal adapted to be combined with and secured to a sandal, a quarter strap lining, an arch cradle strip having an arch cradle portion disposed as a bridge between the side walls of said lining, said strip having terminal ends extending downwardly of the plane of said arch cradle portion and secured to said walls, said quarter strap lining being secured and attached to the upper structure for said sandal, whereby when said arch cradle quarter strap unit structure is attached to said sandal said arch cradle portion is disposed in a substantially horizontal and parallel plane above the insole of said sandal in the area of the longitudinal inner and outer arches and rearward of the transverse arch, said arch cradle portion providing a bridge between the sides of said quarter strap unit structure.

8. The structure defined in claim 7, and in which said terminal ends extend through openings in said side walls to the outside of said lining.

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