A shoe construction providing improved means for the adjustment of its girthwise dimensions.
GIRTHWISE ADJUSTABLE SHOE CONSTRUCTION

BACKGROUND OF THE INVENTION

[0001] This invention comprises a shoe construction providing improved means for adjusting the effective girth of a shoe to properly fit the foot therein, including along both their upper and lower side portions, as well as providing means to keep the foot transversely centered in the shoe at its lesser girth adjustments.

[0002] It is well known that for optimum fit a shoe should not only be of suitable length, but also of the proper effective girth to provide a comfortably close fit, to the foot of the wearer. Earlier, this was often best approached by having one’s shoes made to order by capable cobbler, later joined by somewhat more specialized so-called custom shoemakers. With the Industrial Revolution and particularly in the latter nineteenth century, such custom footwear became largely superseded by typically lower-cost manufactured shoes, initially made available in a limited number of basic styles, often in a range of successive girths, then and still somewhat imprecisely referred to as “widths” for each length size. (Generally the differences between such successive girth sizes range from \( \frac{3}{4} \) to \( \frac{1}{4} \), depending on the size range of the shoe and preference of its manufacturer.

[0003] It should be noted that none of these above approaches have usually fully accommodated the need for full girthwise adjustment of the shoe, particularly in both upper and lower sides of the shoe in its fit critical longitudinal midportions.

[0004] Additionally, with the twentieth century the economics of this particular industry, including a seemingly ever-increasing range of shoe styles being marketed has led to retailers adopting the now-general practice of offering most shoe styles in only one usually medium width for each length size to a maximum assortment of styles to be offered from minimum stock inventories. This approach has presented girthwise fitting problems in general for wearers with feet other than medium girths, and particularly in popular casual shoe styles including the loafer of this disclosure, which have no means of girth adjustment in conventional constructions.

[0005] The present invention provides such girth adjustment means, including the adjustment of the particular ball to instep girth relationship of the shoe to that of the foot of the wearer, while keeping the foot transversely centered in the shoe at all lesser girth adjustments thereof.

[0006] As for relevant prior art, none has apparently been able to satisfy the above criteria essential for optimum girthwise shoe fitting sufficiently to merit their volume production to date. Such prior art includes, but is not limited to the following U.S. Pat. Nos.: 2,691,227; 3,404,468; 3,442,031; 3,541,078; 3,618,235; 3,686,777; 4,279,083; 4,958,341; 4,967,402; 4,969,277; 5,060,402; 5,123,181; 5,153,237; 5,203,096; 5,241,762; 5,325,514; 5,384,970; 6,725,575-B2; and 6,883,254-B2.

[0007] Shortcomings in the above and other relevant prior art are addressed herein by the improved girth adjustment means of the present invention.

SUMMARY OF THE INVENTION

[0008] This invention is directed to a girth adjustable shoe construction having improved means for adjusting the effective girth of a shoe for optimum fit to a foot therein, including in both upper and lower side portions while also keeping the foot transversely centered in the shoe at all lesser girth adjustments thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a side elevational cross-section of a shoe 20 taken along its longitudinal centerline and embodying principles of the present invention.

[0010] FIGS. 2 and 3 show plan views of elements of the shoe 20 of FIG. 1 taken along the lines 2-2 and 3-3 thereof, with FIG. 2 showing these elements as they would appear with the shoe 20 adjusted to greater girth, while FIG. 3 shows their adjustment to lesser girth.

[0011] FIGS. 4 and 5 show transverse elevational cross-sections of the shoe 20 of FIG. 1, taken along the lines 4-4 and 5-5 thereof, with FIG. 4 showing the section with the shoe 20 adjusted to greater girth while FIG. 5 shows its adjustment to a lesser girth.

DEFINITIONS

[0012] The following definitions will be used in reference to terms and phrases used in this disclosure:

[0013] “Automatic girth adjustment”—The automatic adjustment of the effective girth dimensions of a shoe.

[0014] “Ball to instep girth ratio”—The ratio of the effective girth of the foot of the wearer at the ball to the instep portion of the wearer’s foot.

[0015] “Bottom elements”—Shoe elements predominantly under a foot therein.

[0016] “Direct molding”—A shoe manufacturing process in which a unit sole is both molded and attached to the upper assembly of a shoe in the same molding operation.

[0017] “Effective girthwise dimensions”—The full girthwise dimensions of the innermost elements of a shoe.


[0019] “Fit critical”—Essential for optimum fit of a shoe to a foot therein.


[0021] “Girth adjustable”—Adjustable in effective girthwise dimensions.

[0022] “Heel-slip”—The vertical movement of the backpart of a shoe relative to the adjacent heel of a wearer’s foot, as may occur during the stride.

[0023] “Insole”—Lower element of a shoe located under a foot therein and above other elements of the shoe.

[0024] “Lining”—Element of a shoe, typically a sheet material, located within the outer upper and bottom elements of a shoe.

[0025] “Loose”—Having less than continuous attachment to adjacent elements of a shoe.

[0026] “Lower side portion”—The lower 1 to 3 cm. side portions of a foot or shoe.

[0027] “Midportional”—The longitudinally relatively centralized locations of a foot or shoe, particularly at the ball, waist, and instep portions and areas adjacent thereto.

[0028] “Shank”—The rearport bottom portion of a foot or shoe, located between the instep and heel portions thereof.


“Tensionally adjustable”—Adjustable by the application of tension thereon.

“Topline”—The topmost edge areas of upper elements of a shoe.

“Upper side portion”—Side portion of a foot or shoe located above the lower side portion.

“Unitsole”—A unitary bottom-most element of a shoe.

“Vulcanized shoe construction”—A conventional shoe-making process wherein latex based adhesives and bottom and upper elements of a shoe are cured to a final rubber constituency by the application of heat.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings there is shown a typical shoe design in a construction embodying principles of the present invention, applicable to other shoe designs, including those with conventional laces or straps.

FIG. 1 shows a popular handsewn loafer styled casual shoe 20, comprising an upper assembly 22 which includes a vamp 24 attached to a plug 26 as by a handsewn seam 28, and a cuff 30 attached to the vamp 24 by a cuff-stitching 32 and also by topline stitching 34 thereunder (as best seen in later figures), as well as a counter 36 attached to the backpart of the vamp 24 by counter-stitching 38. FIG. 1 also shows girth adjusting midpointional flexible tapes 40. The flexible tapes 40, which are preferably woven and inelastic fabrics, are stitched to the toplines of the vamp 24 together with an elastic, preferably spandex fabric, loose lining 42 thereunder. The loose lining 42 latter extends across the top surface of a loose insole 44 and there are multiple insoles thereunder. As shown there are three additional insoles 46, 48 and 50 under loose insole 44 and above a unitsole 52. The loose lining exerts a tension on the side portions of the shoe 20. The tension generally will vary from about 8 to about 12 ounces per longitudinal inch of the shoe 20, between its toe and heel portions, depending on the girth and tension preferred by the wearer.

As indicated, FIG. 1 shows loose insole 44 (the narrowest insole which defines the least girth for which the shoe is designed) and loose insole 46 (which has the full maximum width for which the shoe is designed) as well as fixed insoles 48 and 50 (which can be combined into a single element if desired).

Incorporated within the insoles is a manual girth adjustment means for the shoe 20. The girth adjustment means comprises a preferably stainless steel circular cam 56, located above or imbedded within fixed insole 46 in combination with a preferably stainless steel manually controlled adjustment screw 54. The adjustment screw 54, shown inset into the bottom shank surface of the unitsole 52, is fixedly attached to the circular cam 56 which includes a variable radium cam-slot 58 containing an eyelet 60 which extends downwards through a longitudinal slot 62 in fixed insole 48. The longitudinal slot 62 allows adjustment of the eyelet 60 and holds the Shank of the adjusting screw 54. The eyelet 60 is held by a washer 64 over the clinched end of the eyelet 60. The barrel of the eyelet holds and adjusts a girth adjusting line 66 extending therefrom to and around the barrel of centerline waist eyelet 68 connecting insoles 46 and 48, to its attachment to the lower ends of the tapes 40, as best seen in FIGS. 2-3.

As shown, the cam system with a single line allow adjustment of shoe girth of about three (3) standard widths/girths. To obtain greater girth adjustment, a doubled line may be used.

FIGS. 2 and 3 show plan views of elements of the shoe 20, taken from the top surface of the insole 46 and showing the stainless steel circular cam 56, including the variably radious cam-slot 58 and eyelet 60 therein, together with the girth adjustable line 66 extending therefrom to and around the barrel of the centerline waist eyelet 68 connecting insoles 46 and 48, to the attachment of the ends of line 66 to the lower waist portions of said tapes 40 as by knots 70 or equivalent means.

The uppermost insole 44 (which contacts a foot inserted in the shoe) has (a) toe and heel portions substantially the same size and shape as an insole that would be used in a single girth shoe which fits a maximum girth foot for which the adjustable girth shoe is designed, and (b) side portions, especially at the ball, waist, and instep areas, which fit a minimum girth foot for which the adjustable girth shoe is designed. The narrowed side portions of insole 44 provide full support of the horizontal weight-bearing bottom surface at all girth adjustments of the shoe 20.

As a result, all insoles of the shoe 20 have matching longitudinal centerlines, which serve to keep the foot securely centered transversely in the shoe 20, at all girth adjustments, an important improvement in shoe construction heretofore unavailable in conventional shoes with typically relatively inelastic upper elements, and particularly needed for athletics and other active wearing use.

FIG. 4 and FIG. 5 show cross-sections of the shoe 20 of FIG. 1, taken along lines 4-4 and 5-5 thereof, with both sections showing elements of the shoe 20 of FIG. 1, including upper assembly 22, with vamp 24 attached to plug 26 by handsewn seam 28, together with the girth adjusting tapes 40 and loose lining 42 attached to the toplines of the vamp 24 by stitching 34. The loose lining 42 is preferably cemented to the top surface of loose insole 44, with insoles 44, 46 and 50 thereunder, the latter attached to vamp 24 by butt-stitching means 54, over unitsole 52 which is attached to the upper assembly 22 as by conventional direct sole-molding means.

The improved girth adjusting means of the shoe construction of this invention provides manually operable girth adjustment means which adjust both the girth and the tension of a shoe to comfortably fit a foot therein over a range of successive girths, providing such fit in both upper and lower side portions of the foot, while automatically adjusting the ball, waist and instep girths to the particular girth relationship of the wearer's foot while keeping the foot securely centered at all girth adjustments thereof.

As for materials and sources, leathers can be from Prime Tanning, Inc., of Berwick, Me. Synthetic leather and other sheet materials can be from Starressor, Inc., of Newburyport, Mass. Elastic spandex fabrics and goring may be from Geo. C. Moore Co. Inc., of Westerly, R.I. Cellulose fiberboard insole materials can be from DerTex, Inc., of Lawrence, Mass. Inelastic flexible woven fabric tapes and Dacron braided girth adjusting line may be from Textile Tapes, Inc. of Sonic, N.H. Eyelets and washers may be supplied by Trendward/Goldberg Footwear Components, Inc., of Salem, Mass.

What is claimed is:

1. A girthwise adjustable shoe construction, comprising a shoe having upper, bottom, and lining elements, and a girth
adjustment means arranged to allow adjustment of the effective girth of (a) upper side portions and (b) lower side portions of elements of the shoe to provide a comfortably close girthwise fit to the foot of the wearer while maintaining the foot transversely centered in the shoe.

2. The shoe construction of claim 1, wherein the effective girth of the shoe is manually adjustable.

3. The shoe construction of claim 2, wherein the girth adjustment means adjusts the tension of the shoe on the foot therein.

4. The shoe construction of claim 1, wherein the effective girth of the shoe is automatically adjustable.

5. The shoe construction of claim 1, wherein the girth relationship of the ball, waist and instep portions of the shoe automatically adjust to those of the foot of the wearer.

6. The shoe construction of claim 1, wherein the adjustment of the effective girth of the shoe is infinitely variable over the girth adjustment range of the shoe.

7. The shoe construction of claim 1, wherein the girth adjustment means comprises a variable radiused cam-slot, in combination with a longitudinal slot and a manually adjustable screw inset in a bottom shank surface of the shoe.

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