Dec. 22, 1964 R. F. PURTELL 3,161,970

SHOE INSOLES

Filed July 17, 1961 2 Sheets-Sheet 1

FIG. 1

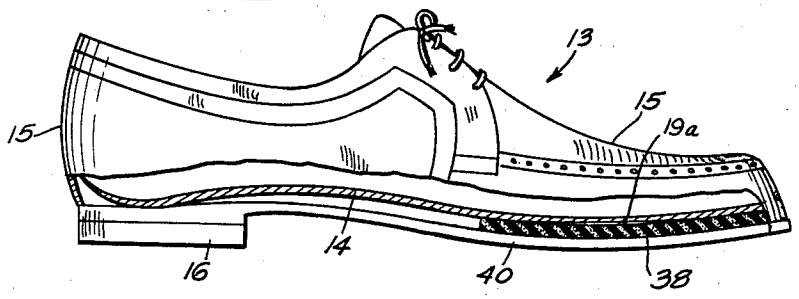


FIG. 2

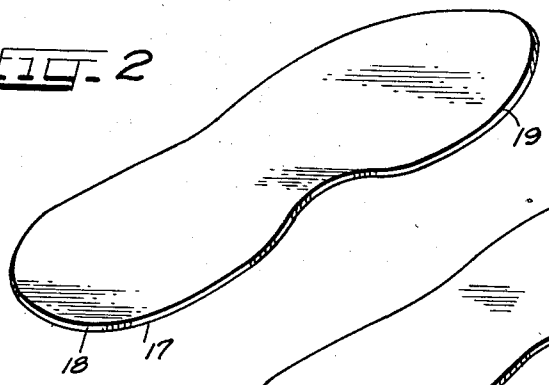


FIG. 3

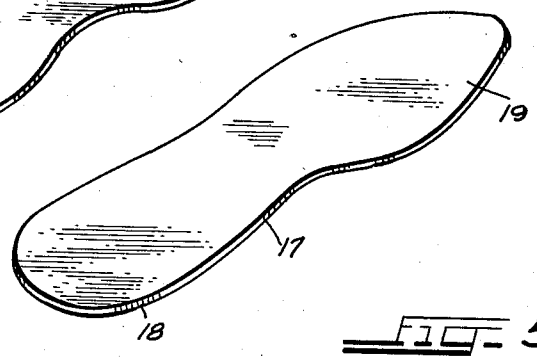


FIG. 4

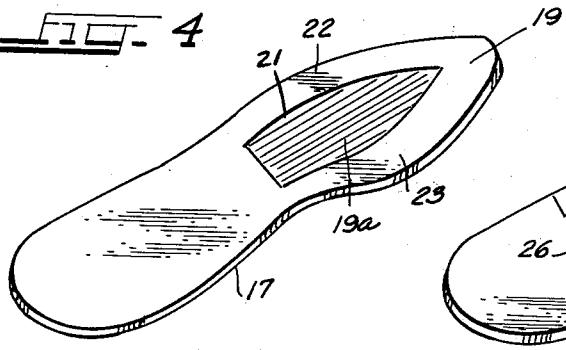
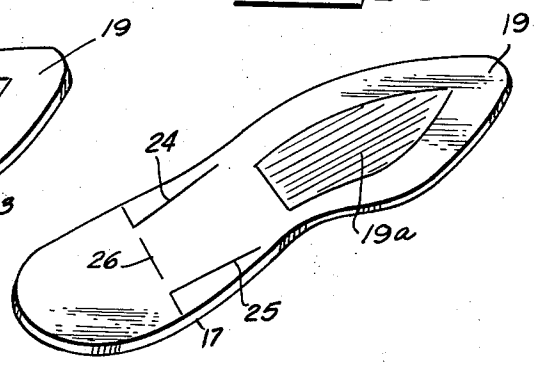


FIG. 5



INVENTOR.
RAYMOND F. PURTELL
BY Ivan D. Jeffs
ATTY.

Dec. 22, 1964 R. F. PURTELL 3,161,970

SHOE INSOLES

Filed July 17, 1961 2 Sheets-Sheet 2

FIG. 6

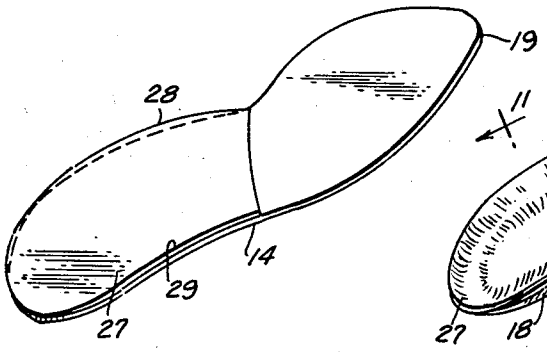


FIG. 7

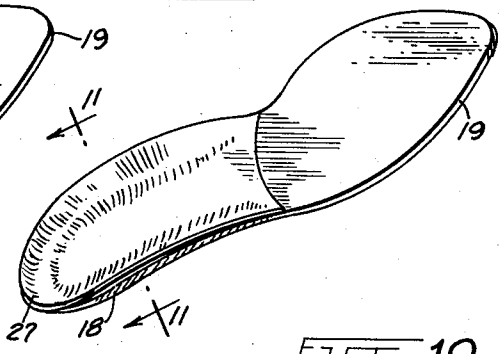


FIG. 10

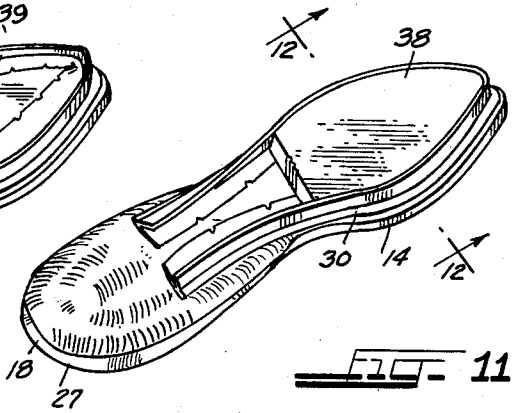


FIG. 8

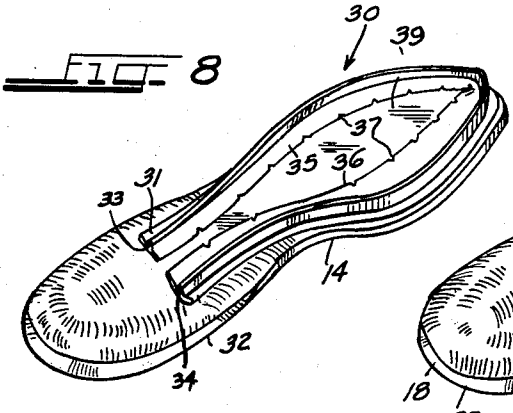


FIG. 11

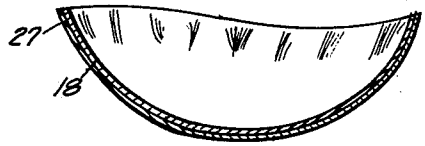


FIG. 9

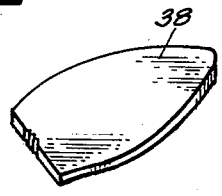
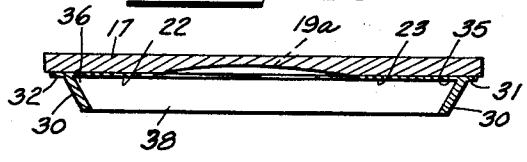


FIG. 12



INVENTOR.
RAYMOND F. PURTELL
BY
Irvin D. Tefft
ATTY.

United States Patent Office 3,161,970 Patented Dec. 22, 1964

3,161,970

SHOE INSOLES

Raymond F. Purtell, Beloit, Wis.
(79 E. Stark St., Nashua, N.H.)

Filed July 17, 1961, Ser. No. 124,629
2 Claims. (Cl. 36—43)

This invention relates to shoe insoles and is more particularly directed to new and improved shoe insoles and to methods of fabrication of such insoles.

In Freeman U. S. Patent No. 2,371,751, the results of scientific study are referred to as indicating that, in walking, the weight of the human foot is first taken on the heel, then, in rapidly rolling rotation, shifted along the outside of the foot and from the small toe to the large toe until the weight rests on the ball of the foot, whereupon the large toe shoves the body forward in a lever-like action as the heel is again raised in the walking gait with the ball of the foot angled with respect to the raised heel. In the above-mentioned Freeman patent, an insole having a cupped heel portion shaped to conform to the contour of the heel of an average human foot is disclosed for supporting the heel to insure that the heel functions in a natural walking manner so that the heel is firmly held upright while the foot is slidably inclined outwardly to carry the weight of the person in the "roll over the outer border" manner until the weight rests on the ball of the foot.

Heretofore, it has generally been thought by those in the art that an inflexible and rigid shoe insole forepart underlying the ball of the foot and toes of the wearer was required to assure proper functioning of the foot to provide a natural coacting relationship between the muscles and bone structure thereof during walking. I have found that natural coacting relationship of the muscles and bone structure of the foot in walking can be provided with a non-rigid insole if the shoe structure includes an integral insole having a heel portion shaped to conform to the contour of a human heel and a flexible forepart underlying the ball of the foot and toes.

It is, therefore, an object of the present invention to provide an improved insole for shoes.

Another object of the present invention is to provide an improved shoe insole which has a flexible forepart.

Still another object of the present invention is to provide a shoe insole having a flexible forepart and a heel portion shaped to conform to the heel of a human foot.

A further object of this invention is to provide a one-piece insole having a flexible forepart and an integral heel portion shaped to conform to the heel of a human foot.

A still further object of the present invention is to provide a shoe having a flexible insole forepart.

Another object of the present invention is to provide a shoe having a one-piece insole with a flexible forepart and a heel portion shaped to conform to the heel of a human foot.

Still another object of the present invention resides in the fabrication of a shoe insole having a flexible forepart.

A further object of the present invention is to provide an improved method for fabricating a shoe having an insole with a flexible forepart and a heel portion shaped to conform to the heel of a human foot.

Yet another object of the present invention is to provide an improved shoe insole which is simple and compact in construction.

The above and further objects are realized in accordance with the present invention by providing in a shoe, a one-piece insole constructed of flexible bends or flexible shoulders and having an integral heel portion shaped to conform to the heel of a human foot and with the flexible forepart formed by reducing the portion thereof underlying the ball of the foot. Flexibility of the shoe is thus

achieved in a show which supports the foot in a manner which does not inhibit the normal functioning of the foot during walking.

These, and other objects, features, and advantages of the present invention will become readily apparent from a careful consideration of the following detailed description, when considered in conjunction with the accompanying drawing, wherein like reference numerals and characters refer to like and corresponding parts throughout the several views and wherein:

FIG. 1 is a side elevational view of a shoe, in partial section, illustrating an insole construction in accordance with the principles of the present invention;

FIG. 2 is a perspective view of a rough insole blank taken from the bottom thereof;

FIG. 3 is a perspective view of an insole taken from the bottom thereof shaped from the blank of FIG. 2;

FIG. 4 is a perspective view of the insole of FIG. 3 illustrating the bottom of the insole with the reduced forepart which increases insole flexibility;

FIG. 5 is a perspective view of the insole of FIG. 4 illustrating the bottom of the insole premarked for proper alignment of a prefabricated ribbed strip;

FIG. 6 is a perspective view taken from the top of the insole blank of FIG. 5 with a heel pad attached;

FIG. 7 is a perspective view of the insole of FIG. 6 illustrating the top of the insole which has been provided with a molded cupped heel portion shaped to conform to the heel of a human foot;

FIG. 8 is a perspective view of the underside of the insole of FIG. 7 having a prefabricated precoated insole rib attached thereto;

FIG. 9 is a perspective view of a cushioning filler employed in conjunction with the ribbed strip of FIG. 8;

FIG. 10 is a perspective view of the underside of the insole illustrating the cushioning filler of FIG. 9 in place in the cavity formed by the ribbed strip of FIG. 8;

FIG. 11 is an enlarged view in partial section taken along lines 11—11 of FIG. 7 illustrating the contoured heel portion shaped to conform to the heel of a human foot of the present invention;

FIG. 12 is an enlarged sectional view taken along lines 12—12 of FIG. 10, turned 180°, illustrating the reduced portion of the forepart of the insole of FIG. 10.

Briefly stated, the present invention relates to new and improved methods for forming a one-piece shoe insole which has an integral and flexible forepart and a cupped heel portion shaped to conform to the heel of a human foot, and to the insole so formed.

Referring now to the drawings and particularly to FIG. 1 thereof, there is shown a shoe 13 constructed in accordance with the principles of the present invention. The shoe 13 has an integral or one-piece insole 14 and the uausl vamp 15 and heel 16.

FIG. 2 illustrates a leather insole body blank 17 found useful in the manufacture of shoes in accordance with the practice of the present invention. The insole blank includes a heel portion 18 and a forepart 19 of generally uniform cross-sectional dimension. In FIG. 2, the insole blank 17 is shown as having been dyed out of the hide in a shape to conform to the general configuration of a shoe insole. The insole blank 17 is stamped or shaped from a flexible and moldable leather material, known in the trade as "flexible bends" leather, which is taken from the rump of the beast and which has the characteristics of flexibility and moldability required in the manufacture of shoe insoles in accordance with the present invention. Although it is preferred to use "flexible bends" for the insole of the present invention, "flexible shoulders" may also be used with some sacrifice in flexibility.

Having been stamped or dyed, the rough insole blank

17 is next subjected to the operation of a planet insole rounder of conventional construction to round the blank 17 to the final insole shape, as appears in FIG. 3.

After the blank has been rounded, a portion 19*a* of the forepart of the insole 17 which is to underlie the area of the ball of the foot of a wearer of a shoe including the finished insole is then centrally "reduced" as indicated at 21. The reduced portion 19*a* is preferably contoured to the general peripheral shape of the forepart 19 and reduced from a maximum cross-sectional thickness of 6½ irons to a minimum of 3½ irons, as by shaving with conventional equipment, such as a reducing machine. As best appears in FIG. 12, the center of the reduced portion 19*a* of the insole in cross-section is of lesser dimension than the outer margins thereof along the full length of the reduced portion 19*a* or the reduced portion 19*a* is tapered upwardly and outwardly from a point on the longitudinal axis of the insole to the edges of the reduced portion or to the margins 22 and 23 of the insole. In this manner, the flexibility of the forepart 19 of the insole is increased while maintaining the overall strength of the insole, which is so necessary for proper support of the foot.

The bottom of the insole is then marked or scored, as appears in FIG. 5 wherein are shown spaced L-shaped lines 24 and 25 and a transverse line 26 which are made by the operator as with templates to serve as guide lines for true alignment, in a later operation, of a pre-formed ply-rib tape or, as appears in FIG. 8, a prefabricated ribbed strip 30 of known type, such as that disclosed in U.S. Patent No. 1,937,678. The marking line 26 completes the guide lines required for alignment of the ribbed strip 30. The guide lines 24–26 are made in the insole manufacturing process of the present invention, preferably after the forepart reducing operation is completed, so that during subsequent operations, the outer limits or margins of the location of the ribbed strip may be easily identified and assembly of the insole facilitated since the operator need only lay the tape or ribbed strip 30 along the guide lines and cement the ribbed strip 30 to the insole 17.

After the operator has so marked the insole with guide lines 24–26, the insole is turned over and a shank and heel piece or heel pad 27 is secured to the insole as, for example, by cementation. The shank and heel piece or pad 27 is sized to provide margins 28 and 29 overlying the edge boundaries of the insole 17 to facilitate securing of the insole to the vamp and to prevent the insole boundaries from detracting from the appearance of the shoe.

The cement-attached heel pad 27 and the underlying insole heel portion 18 are next molded to form a heel portion 18 shaped to conform to the contour of the heel of an average human foot. The cupped or contoured heel, as best appears in FIGS. 7 and 11, may be formed into the contour shape in accordance with the teaching of the above-mentioned Freeman patent. The flexible bends leather is characterized, as aforesaid, by the feature of moldability, as well as flexibility.

When the contoured heel forming operation is completed, the insole 17 is again turned over and to the undersurface of the insole is glued the ply-tape or prefabricated ribbed strip 30, such as that disclosed in U.S. Patent No. 1,937,678. The ribbed strip 30 is also at least partly attach by a ribbed strip attaching machine, such as that described in U.S. Patent No. 2,613,377. The ribbed strip 30 may be exactly positioned on the undersurface of the insole 17 by aligning the outer flanges 31 and 32 of the strip 30 with the pre-marked guide lines 24 and 25 and by aligning the edges thereof, 33 and 34, adjacent the heel portion 18 with the pre-marked guide line 26. It will be observed that by the simple means of pre-marking the insole, the ribbed strip 30 may be exactly aligned in the

desired position to assure a proper assembly of the shoe even by inexperienced operators. If desired, the inner attaching flanges 35 and 36 of the ribbed strip 30 may be pinked along the lengths thereof, as indicated at 37, to accommodate bending of the strip 30.

Another conventional method of forming the ribbed strip 30 may also be employed wherein the operator knifes the leather of the insole to form parallel channels conforming to the contour of the ribbed strip 30 shown in FIG. 8 and wherein the leather between the channels is raised to form a lip to be sewn to the outsole and which is sized to accommodate a resilient cushioning pocket piece or filler 38.

The filler 38, formed of sponge rubber of medium density is seated in and fills the cavity 39 (FIG. 8) defined by the attached ribbed strip 30 and insole, as shown in FIG. 10. Before insertion thereof into the cavity 39, the filler 38 is suitably coated with cement for securing the filler to the sides of the ribbed strip 30 and the insole-defined bottom of the cavity 39.

With the filler 38 cement-attached to the ribbed strip 30 and bottom of the cavity 39, the insole assembly is now completed and ready for incorporation in a shoe assembly. The insole and ribbed strip are stitched to the outsole 40 (FIG. 1) and the shoe assembly is then completed.

Although various minor modifications of the present invention will become readily apparent to those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon, all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim:

1. A one-piece insole having a heel portion shaped to conform to the contour of the heel of a human foot, an integral flexible forepart portion partially reduced in thickness only in the area located inwardly of the edges of the insole, a rib formed on the bottom of said insole and being located outwardly of the reduced portion of the insole thereby defining a cavity in the forepart of said insole, a resilient pad of cushioning material underlying substantially the entire forepart of said insole within the cavity defined by said rib, whereby the flexibility and the support of the insole are achieved in a manner that improves the normal functioning of the human foot during walking.

2. The insole of claim 1 wherein said insole is constructed of flexible bends leather.

References Cited in the file of this patent

UNITED STATES PATENTS

32,487	Plumer	June 4, 1861
1,354,936	Abbott	Oct. 5, 1920
1,781,715	Blakely	Nov. 18, 1930
1,960,418	Schaller	May 29, 1934
2,018,710	Elkin	Oct. 29, 1935
2,027,072	Tweedie	Jan. 7, 1936
2,072,727	Bain	Mar. 2, 1937
2,083,581	Silver	June 15, 1937
2,171,414	Givren	Aug. 29, 1939
2,571,299	Sherbrook	Oct. 16, 1951
2,794,996	Stritter	June 11, 1957
2,814,133	Herbst	Nov. 26, 1957

FOREIGN PATENTS

1,207,258	France	Feb. 16, 1960

OTHER REFERENCES

Leather in Life Art and Industry, pages 158 and 159.