Feb. 26, 1946. H. L. SUTCLIFFE 2,395,767

ARTICLE OF FOOTWEAR

Filed Nov. 4, 1943

Fig. 5.

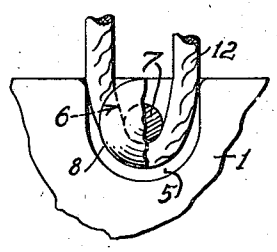


Fig. 1.

Fig. 2.

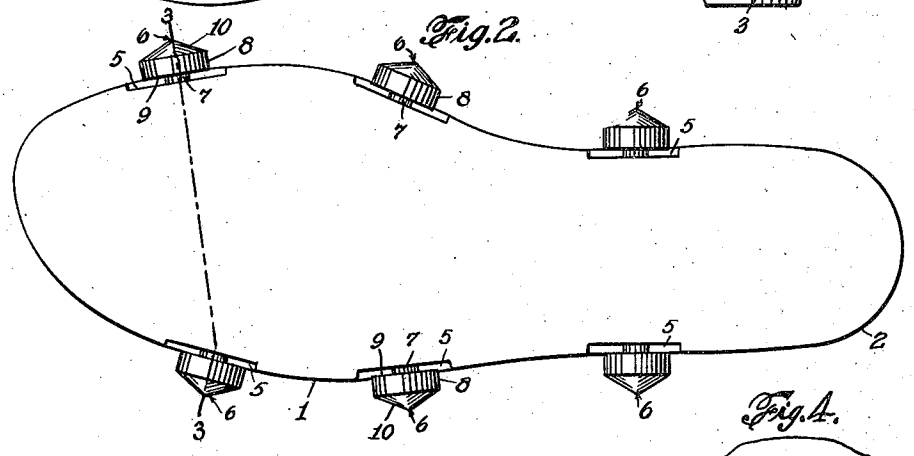


Fig. 3.

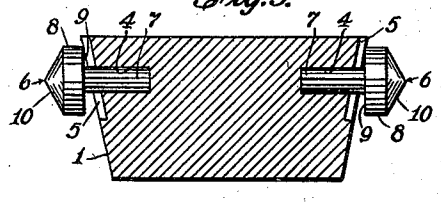
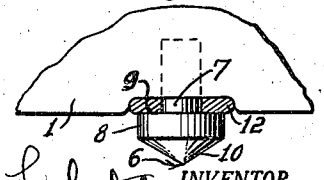


Fig. 4.



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ARTICLE OF FOOTWEAR

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Application November 4, 1943, Serial No. 508,902

3 Claims. (Cl. 36—11.5)

My invention consists in the novel features hereinafter described, reference being had to the accompanying drawing, which illustrates one embodiment of the same and a slight modification thereof, selected by me for purposes of illustration and the said invention is fully disclosed in the following description and claims.

The present invention relates to articles of footwear such as shoes, slippers, sandals, etc., and to a method of making the same.

It is an object of the present invention to provide articles of footwear which can be constructed of non-critical materials such as wood, fabric and artificial leather, and which are nevertheless comfortable, durable and attractive. It has heretofore been proposed to form the soles of shoes of wood, glass plastic and other materials, providing a relatively thick rigid sole. However, in such shoes, considerable difficulty has been experienced in attaching the upper to the sole, since the rigidity of the sole results in the application of relatively high stresses to the attaching means when the foot of the wearer is flexed, as in walking. The use of fastening means such as tacks, staples, nails, screws, etc., has proven unsatisfactory. The stresses transmitted by such fastening means on the wood of the sole and fabric or other material of the upper, is usually so localized and concentrated that the upper will eventually pull loose from the sole. Moreover many of the fastening means heretofore proposed have been unattractive and unsightly in appearance, impairing the commercial value of the footwear.

These objections and difficulties are fully overcome by the present invention, in accordance with which the upper is secured to the sole in such manner that it will not pull loose. The fastening means employed in accordance with my invention causes the forces to which it is subjected to be distributed and controlled so that no deleterious concentration of stresses occurs, and structural failure of the material is thereby avoided. Moreover the fastening means in accordance with my invention is not only unobjectionable in appearance, but adds substantially to the style and attractiveness of the article.

Further objects and advantages of my invention will be understood from the appended claims and from the following description of an embodiment which I have selected by way of example to illustrate my invention, and which is shown in the accompanying drawing where,

Fig. 1 is a side elevation of an embodiment of my invention, a portion of the wearer's foot being shown for purposes of illustration.

Fig. 2 is a top plan view of the sole of the shoe shown in Fig. 1 with the upper removed.

Fig. 3 is a transverse vertical sectional view taken approximately on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary top plan view showing one of the fastening studs and adjacent portions of the shoe.

Fig. 5 is a fragmentary side elevation of the portion shown in Fig. 4.

In the shoe shown by way of example in Figs. 1 to 5 to illustrate my invention, the sole 1 is relatively thick and rigid, and may be formed of any suitable material such as wood, glass or plastics. A heel portion 2 is preferably formed integral with the sole, although it may if desired be provided with a separate heel cap 3. If the unitary sole and heel structure is formed of glass, plastic or other moldable material, it may be cast or molded to the desired shape. If it is formed of wood it can be carved or turned by hand or by suitable woodworking machinery, for example, the kind used in making wooden lasts. The lower surface of the shank, ball and toe portions of the sole is curved as shown to provide a rocker action. The upper surface of the sole is also curved to follow the natural contour of the foot and to prevent the foot from slipping forward on the sole. A separate insole may, if desired, be adhesively or otherwise secured to the upper surface of the sole. However, a separate insole is not necessary to the construction in accordance with my invention and for the sake of simplicity it is preferably omitted. If the sole and heel unit is formed of wood or other material requiring a surface finish, it may be painted, enamelled or otherwise finished, preferably before attaching the upper of the shoe as described below.

In each of the side edges of the sole there are formed a plurality of spaced inwardly extending cylindrical holes 4, three such holes being formed in each side of the sole in the embodiment illustrated. A shallow recess 5 is formed in the side edge of the sole around each of the holes 4. The recess 5 is preferably of approximately uniform depth so that the bottom of the recess is approximately parallel to the surface of the side edge of the sole. Each of the holes 4 is adapted to receive a peg or stud 6 having a cylindrical shank 7 which fits tightly into the holes. The outer end of the stud projects out beyond the edge of the sole and is provided with an enlarged head 8. The inner surface 9 of the head may be flat as shown, while the outer surface 10 is preferably rounded, conical or otherwise shaped to give it a decorative appearance. In the embodiment illustrated the holes 4 are spaced sufficiently from the upper surface of the sole that the enlarged heads 8 of the studs 6 do not project above the sole. The recesses 5 are shown as being slightly larger than the heads of the studs 6 and extend to the upper surface of the sole, the upper portions of the recesses being flared outwardly.

The upper of the shoe shown in Figs. 1 to 5 is shown as a continuous cord 11 which is laced back and forth across the top of the foot and has

portions 12 that pass around under the studs 6 disposed in the holes 4. It will be seen that the portions 12 of the cord 11 lie in the recesses 5 between the bottom of these recesses and the inner faces 9 of the heads of studs 6. A continuation 13 of the portion of the cord 11 that is laced back and forth over the foot of the wearer and under the studs 6 is adapted to be wound around the wearer's ankle as shown, and may be tied in a knot 14.

A feature of this embodiment of my invention is that the cord 11 is wedged between the heads of studs 6 and the bottoms of the recesses 5 in the side edges of the sole, so that when the cord 11 has been properly laced over the foot of the wearer and under the studs 6, it will be held securely in place. When the shoe is removed from the foot the knot 14 is untied and the portion 13 is unwound from the ankle, but the laced portion of the cord is held by the wedging action of the studs and remains in place. As shown in Figs. 3, 4 and 5, this wedging action results from the fact that the holes 4 in which the shanks 7 of studs 6 are inserted, are bored or otherwise formed approximately parallel to the upper surface of the sole. The inner surfaces 9 of the heads of studs 6 are hence approximately vertical. However, the side edges of the sole are not vertical, but are inclined inwardly and downwardly as shown in Fig. 3. The bottom surfaces of the recesses 5 are hence likewise inclined. This results in the inner face 9 of the head of the stud and the bottom surface of recess 5 being inclined relative to one another so that they are spaced farther apart adjacent the lower portion of the heads and closer together adjacent the upper portion of the heads. In lacing the cord 11 it is passed in under studs 6 and then pulled upwardly so that it is wedged tightly between these inclined surfaces and firmly held by this wedging action. It will be understood that the wedging action can be obtained by suitably shaping the inner surface 9 of the head of the stud and the bottom surface of the recess 5 without having the edges of the sole inclined, as shown in Fig. 3.

It will be noted that the studs, by means of which the upper is anchored to the sole, are of relatively large cross section. With this construction any forces tending to pull the upper away from the sole are distributed over a considerable area, and deleterious concentration of stresses is effectively avoided. This is of particular importance in using material such as wood having relatively low tensile and compressive strength. Moreover it will be seen that the pull of the upper on the studs is in a direction at approximately right angles to the studs and to the holes in which the studs are secured and there is no tendency to pull the studs from their holes. The studs are of sufficiently large cross section that they have no tendency to bend under the pull of the upper and the amount of shear to which the studs are subjected is negligible in proportion to their strength. It is thus possible with the present invention to use relatively low strength non-critical material and yet produce a shoe that will stand up to long periods of hard wear.

In making the shoe shown in Figs. 1 to 5, the sole is molded, turned or otherwise formed to the desired shape including the holes 4 and recesses 5. The studs 6 are then pushed or driven into place and may if desired be secured by adhesive. The upper is thereupon attached to the sole merely by lacing the cord 11 back and forth across the top of the foot and around and under the studs 6, as shown. If desired a suitable form may be employed in lacing the cord 11. By pulling the cord up tight and wedging it under the edge of studs 6, it is firmly secured in place. Any painting, enameling of the sole, 1, and the studs 6 is done before the upper is attached and preferably before the studs and sole are assembled so that contrasting color can be used to obtain a further decorative effect.

Although in the specific embodiment of my invention illustrated in the drawing the upper is shown by way of example as a continuous cord laced back and forth across the top of the foot of the wearer, it will be understood that the term "upper" as used in the claims is intended to designate any suitable means of holding the sole on the wearer's foot and that the upper may be formed of other material such for example as straps or sheet material.

What I claim and desire to secure by Letters Patent is:

1. An article of footwear comprising a thick, rigid sole having in each of its side edges a plurality of spaced, inwardly extending holes and a recess surrounding each of said holes, said recesses extending to the upper surface of the sole, a stud fitting tightly in each of said holes and anchored firmly therein, said stud having a head which is spaced from the bottom of the recess surrounding said hole, the space at the lower portion of the head being greater than that at the upper portion of the head, and a cord passing under said studs and up over the foot of the wearer, said cord being wedged in the decreasing space between the head of the studs and the bottoms of the corresponding recesses to permanently anchor the cord in place.

2. An article of footwear comprising a thick, rigid sole having in each of its side edges a plurality of spaced holes, each extending inwardly approximately parallel to the upper surface of the sole, a recess surrounding each of said holes, the side edges of the soles and the bottoms of the recesses forming an angle of less than ninety degrees with the upper surface of the sole, a stud anchored in each of said holes and projecting therefrom with an enlarged head at the outer end of the stud, the inner face of the head of the stud being inclined with respect to the bottom of the corresponding recess, and an upper having anchor portions extending under said studs and wedged between the heads of said studs and the bottoms of said recesses.

3. An article of footwear comprising a thick, rigid sole having in each of its side edges a plurality of spaced holes, each extending inwardly approximately parallel to the upper surface of the sole, a recess surrounding each of said holes, a stud anchored in each of said holes and projecting therefrom with an enlarged head at the outer end of the stud, the inner face of the head of the stud being inclined with respect to the bottom of the corresponding recess, and an upper having anchor portions extending under said studs and wedged between the heads of said studs and the bottoms of said recesses.

HARRY L. SUTCLIFFE.