June 14, 1955 E. LISKA 2,710,463

REPLACEMENT SEGMENT FOR WORN FOOTWEAR

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FIG. 1

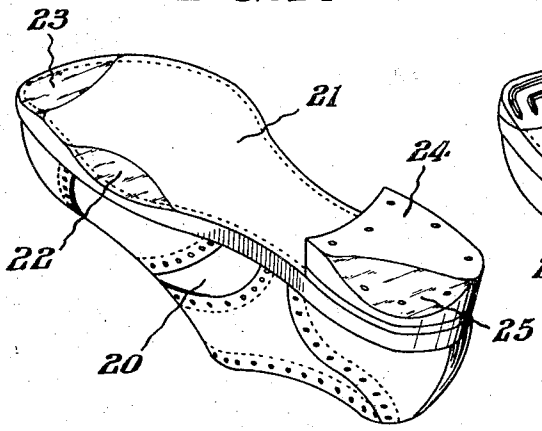


FIG. 2

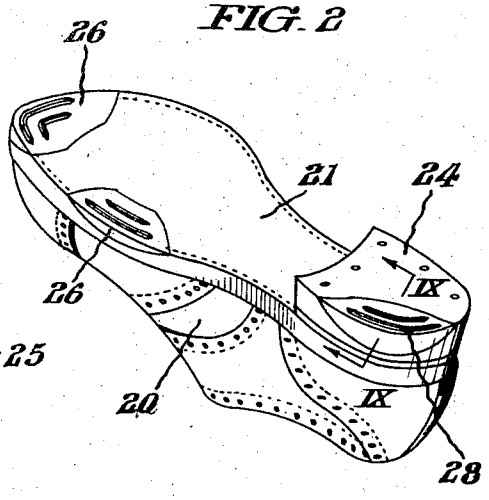


FIG. 3

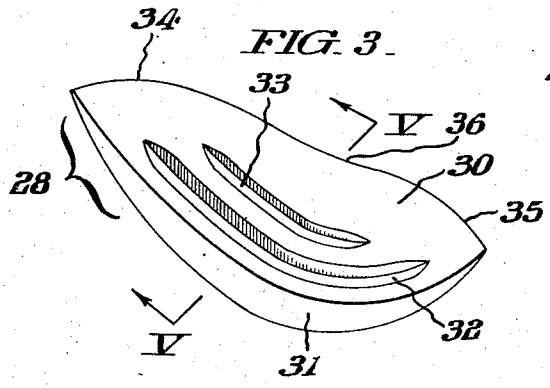


FIG. 4

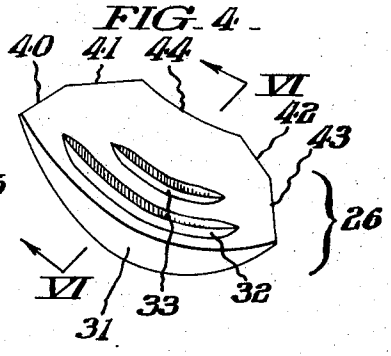


FIG. 5

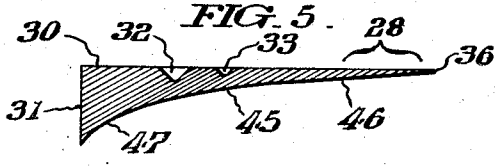


FIG. 6

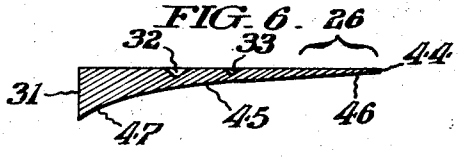


FIG. 7

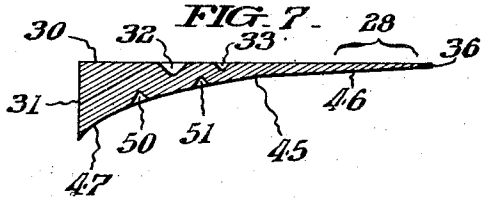
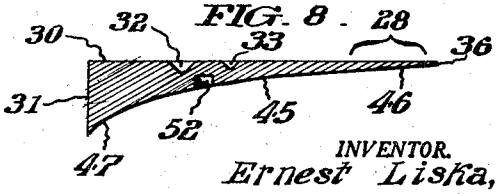


FIG. 8



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FIG. 9.

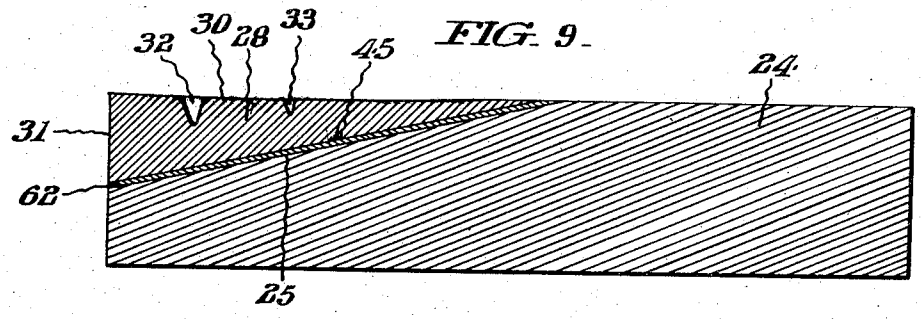


FIG. 10.

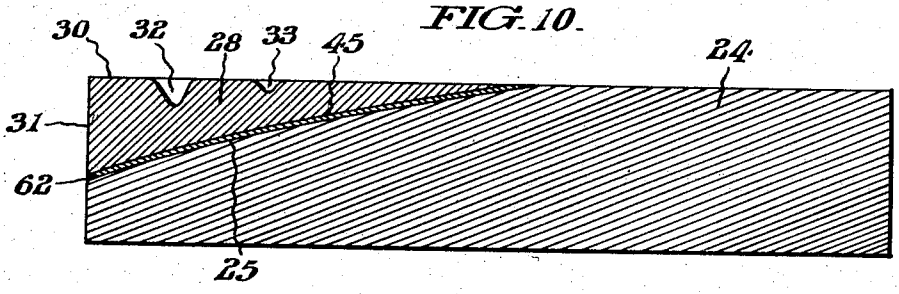


FIG. 11.

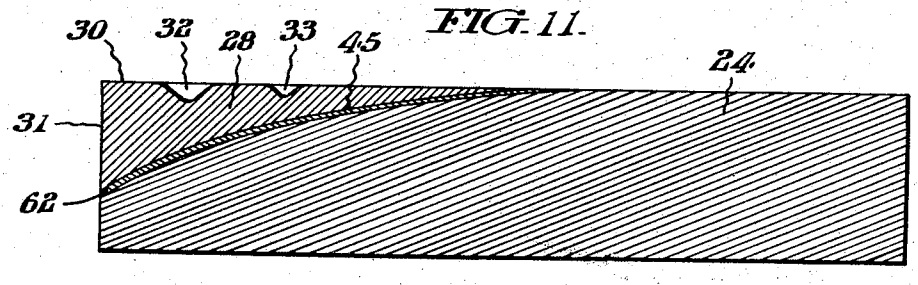
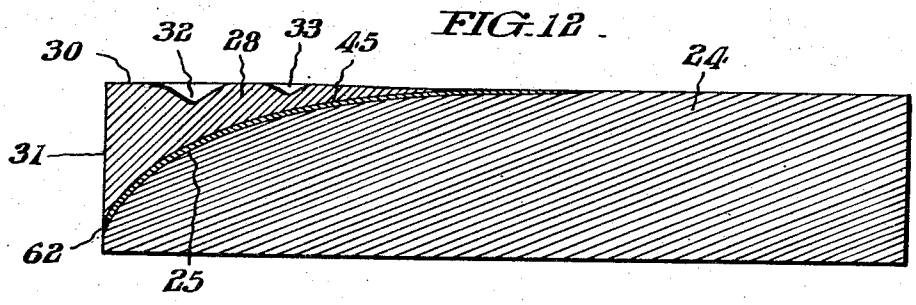


FIG. 12.



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REPLACEMENT SEGMENT FOR WORN FOOTWEAR

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4 Claims. (Cl. 36—71.5)

This invention relates to a replacement segment for rebuilding worn portions of the treads of footwear such as shoes and the like. More specifically, the invention relates to replacement cleats or wedges constructed and arranged for adhesion to worn portions of the soles or heels of footwear.

The prior art discloses replacement segments of various types, such segments sometimes being made of rubber and being affixed to the sole or heel of the shoe. Ordinarily such replacement segments have been affixed to the shoe by means of nails, but after extended use the edges of the replacement segments have become worn and have tended to separate from the heel or sole.

While efforts have been made to secure replacement segments to worn out soles or heels by adhesion, this expedient has not as yet met with any substantial commercial success, partly because of adhesive failures. Notwithstanding the development of improved adhesives, the problem of obtaining good adhesion over extended periods of use has remained.

It is accordingly an object of this invention to provide a replacement segment for worn footwear tread surfaces. Another object is to provide a replacement segment which may be secured by means of adhesive to the wearing surface of the sole or heel of a shoe.

I have determined that it is of substantial importance in obtaining long-lasting adhesion to provide a replacement segment with an upper surface of specific curvature which corresponds very closely to the curvature of the worn heel or sole portion to which it is to be attached. When the adjacent adhered surfaces have substantial identical curvatures they are not only more firmly secured together at the outset, but also are less subject to failure in the course of their use.

Upon examining large numbers of worn out heels or soles, I have determined that the worn surfaces have various shapes. Most of the worn surfaces are curved, but occasionally some of them have substantially flat portions in part at least Moreover the extent of the curvature varies widely.

It is accordingly another object of this invention to provide a standard replacement segment for worn out soles or heels which may be universally applied to worn footwear having worn surfaces of various shapes and types. Other objects and advantages of this invention will further appear hereinafter and in the drawings, whereof:

Fig. 1 represents a view in perspective showing the sole and heel portions of a worn shoe, illustrating typical worn portions on the heel and sole.

Fig. 2 represents a view similar to Fig. 1, with replacement segments applied to the worn areas in accordance with this invention.

Fig. 3 represents a view in perspective of the sole and side wall surfaces of a replacement segment constituting one specific embodiment of this invention.

Fig. 4 represents a view in perspective similar to Fig. 3, showing another embodiment of this invention.

Figs. 5 and 6 represent sectional views taken as indicated by the lines and arrows V—V and VI—VI which appear in Figs. 3 and 4, respectively.

Figs. 7 and 8 represent sectional views similar to Figs. 5 and 6, showing modified replacement segments.

Fig. 9 represents a sectional view taken as indicated by the lines and arrows IX—IX which appear in Fig. 2, showing how the replacement segment is adhered to a substantially level worn out portion of a shoe heel; and

Figs. 10–12 represent sectional views similar to Fig. 9, showing how replacement segments in accordance with this invention may be adhered to worn out shoe heels having worn surfaces of various curvatures.

Turning now to the specific embodiments of the invention illustrated in the drawings, Fig. 1 shows a shoe **20** having a sole **21** with worn portions **22, 23**. The shoe **20** has a conventional heel **24** having a worn portion **25**. As shown in Fig. 1, the worn portions **22, 23** and **25** are substantially flat, having little if any curvature. However it is to be appreciated that these worn portions may have curvatures of various types and degrees.

Fig. 2 shows the shoe **20** provided at its side edge with a replacement cleat **26**, at its front edge with a replacement cleat **26**, and at its heel with a replacement wedge **28**, the cleats and wedges being affixed to the shoe by means of an adhesive as will appear hereinafter. The wedges and cleats are both generally wedge-shaped, and are referred to hereinafter generically as wedges.

Fig. 3 shows the replacement wedge **28**, which in accordance with this invention consists of relatively stiff, thick material such as sole rubber, leather, synthetic resinous sole materials or the like. The replacement wedge **28** has a sole surface **30** constituting its wearing face, and has a side wall surface **31** which is a plane surface curved in accordance with the usual curvature of the side wall of the shoe heel. Formed in the bottom surface **30** is an elongated groove or channel **32** which preferably has a curvature corresponding to the curvature of side wall **31**. Preferably the groove **32** is closely adjacent to side wall **31** and parallel thereto. The groove **32** extends into the replacement segment to a substantial depth, say about one-quarter to about three-quarters the thickness of the replacement segment.

In the embodiment of the invention illustrated in Fig. 3, the wearing surface **30** is also provided with an inner groove or channel **33** which is parallel to and spaced inwardly from channel **32**. Groove **33** also has a curvature corresponding to the curvature of side wall **31**. It is preferably of less length than groove **32**, and also of less depth. Like groove **32**, groove **33** preferably does not penetrate completely through the replacement segment **28**.

It will be observed that the replacement segment **28** is in the form of a wedge, the inner edge of which includes a forward convex portion **34**, a rear convex portion **35**, and an intermediate concave portion **36**.

The replacement cleat **26** shown in Fig. 4 is generally similar to the replacement wedge **28** just described, but it is somewhat smaller and its inner edge has a different shape. As shown in Fig. 4, the inner edge includes straight forward portions **40, 41** disposed at an angle to one another, straight rear portions **42, 43** disposed at an angle to one another, and an intermediate concave curved portion **44**.

Figs. 5 and 6 illustrate the generally V shaped cross section of the grooves **32, 33**, and moreover illustrate the curvature of the face **45** which is to be adhered to the worn face of the shoe heel or sole. It will be observed that the inner portion **46** of face **45** is substantially flat or has very little curvature; gradually the curvature increases toward the outer portion of face **45**, with maximum curvature at **47** immediately adjacent to the side wall **31**. Thus it will be apparent that the replacement segments in

accordance with this invention are preferably generally parabolic in cross section, said section lying in a plane taken substantially perpendicular to the side wall **31**, although the curvature need not of course correspond precisely to the specific geometry of a parabola.

Fig. 7 illustrates an embodiment of the invention wherein a pair of spaced apart grooves **50, 51** are formed in the face **45** which is to be adhered to the worn heel or sole portion. Such grooves are substantially identical to the grooves **32, 33**. As shown in Fig. 7, groove **50** is located outwardly of groove **32**, while groove **51** is intermediate the grooves **32, 33**.

Fig. 8 shows another modified form of replacement segment wherein the face **45** is provided with one or more cylindrical holes **52**. When a plurality of such holes **52** are provided, they are spaced apart from one another along a line parallel to the curvature of side wall **31**. As shown in Fig. 8, the hole **52** is disposed intermediate the grooves **32, 33**.

It will accordingly be apparent that the grooves **32, 33** as well as the grooves **50, 51** and holes **52** materially reduce the cross sectional area of the replacement segment along lines substantially parallel to its side wall **31**. Thus the segment is flexible along lines parallel to its side wall whereby the curvature of the generally parabolic face **45** may readily be varied by flexing the segment in the plane transverse to the curvature of the curved face **45**. Thus, the replacement segments are readily adaptable to worn surfaces of various curvatures, even at points immediately adjacent their side walls where the segments are of greatest thickness. This is an important and advantageous feature of this invention.

Figs. 9–12 illustrate how a standard replacement segment **28** is adapted to be deformed to provide a precise fit with worn heel or sole portions of various curvatures. Fig. 9 shows how the segment **28**, with its normally generally parabolic face **45**, may be applied against a substantially flat surface **25** in which case the sole surface **30** becomes slightly concave and the grooves **32, 33** are narrowed thereby providing intimate contact between the surfaces **45, 25** through the adhesive layer **62**. In Fig. 10 the surface **45** has a slight curvature and the grooves **32, 33** are somewhat wider. In Fig. 11 the curvature of surface **45** is substantially greater and the grooves **32, 33** are further widened. In Fig. 12 the face **45** has a much more exaggerated curvature, particularly in the portion immediately adjacent the side wall **31**. The notches **32, 33** are wide open and the wearing face **30** is slightly convex.

In all the structures shown in Figs. 9–12 the replacement segment face **45** conforms to the worn surface of the heel or sole, and is intimately bonded thereto by the adhesive layer **62**. Moreover, the flexibility of the replacement segment minimizes residual stresses resulting from the deformation of the replacement segment. Such residual stresses are undesirable since it is their tendency to act in opposition to the adhesive forces of the adhesive layer, and to cause the replacement segment to pull away from the heel or sole.

It will be appreciated that the grooves **32** and **33**, in addition to their other functions as just described, serve in actual use as traction members for the heels or soles, providing a better grip in walking on floors or other surfaces.

It will also be appreciated that the grooves **50, 51** and holes **52** create a suction between the heel or sole and the attached replacement segment, thereby strengthening the adhesive bond between them.

While I have shown slots as one form of indentation in the replacement segment, it will be appreciated that other specific forms of indentations may be substituted for slots in accordance with this invention, provided such indentations are arranged adjacent the side wall of the segment rendering the relatively thick portions of the replacement segment flexible to the extent that they may be bent or deformed to the contour of the worn edge of a heel or sole.

While I have selected several specific embodiments of the invention for illustration in the drawings, it will be appreciated that equivalent elements may be substituted for the features specifically discussed above, without departing from the scope of the invention. Moreover, certain of the parts may be reversed and certain features of the invention may be used independently of other features, all within the spirit and scope of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. A replacement segment for the worn edge of a shoe comprising a piece of bendable material having a substantially parabolic surface, a substantially flat wearing surface, a curved thick side wall substantially perpendicular to said wearing surface, said side wall connecting said parabolic and wearing surfaces, and said segment having a groove extending substantially one-half the thickness of the side wall and substantially parallel thereto, said groove being of sufficient depth to provide flexibility adjacent said side wall to allow the thick part of the segment to conform to the surface of a worn shoe to which it is to be affixed, said substantially parabolic surface having its substantially parabolic curvature in a plane extending approximately perpendicular to said side wall.

2. The replacement segment defined in claim 1 wherein another groove is formed in said segment substantially parallel to said side wall, one such groove extending into the wearing surface and the other such groove extending into the parabolic surface.

3. The replacement segment defined in claim 1 wherein a plurality of said grooves is provided, a pair of said grooves being formed in said wearing surface and another pair of grooves being formed in said parabolic surface, all said grooves being substantially parallel to one another and said pairs being staggered in relation to one another.

4. The replacement segment defined in claim 1 wherein a hole is formed in said segment substantially opposite said groove.

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