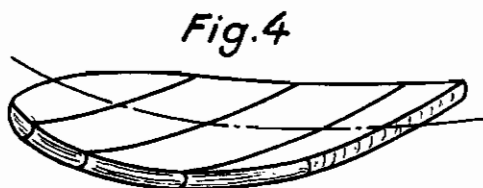
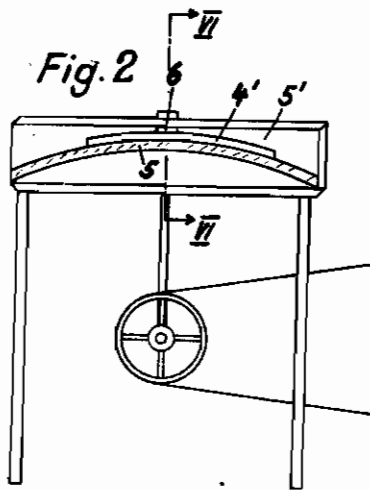
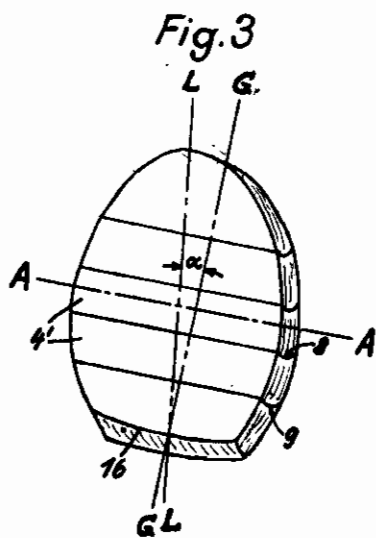
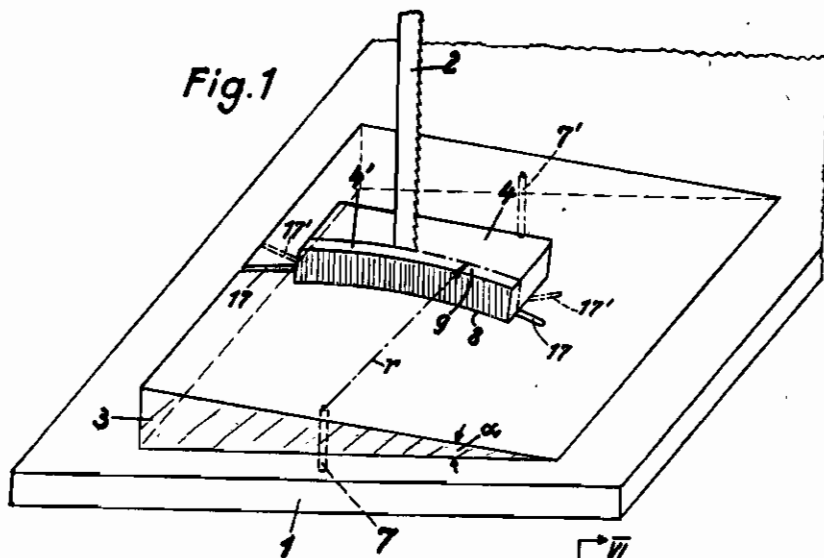


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SOLES FOR SHOES AND SANDALS
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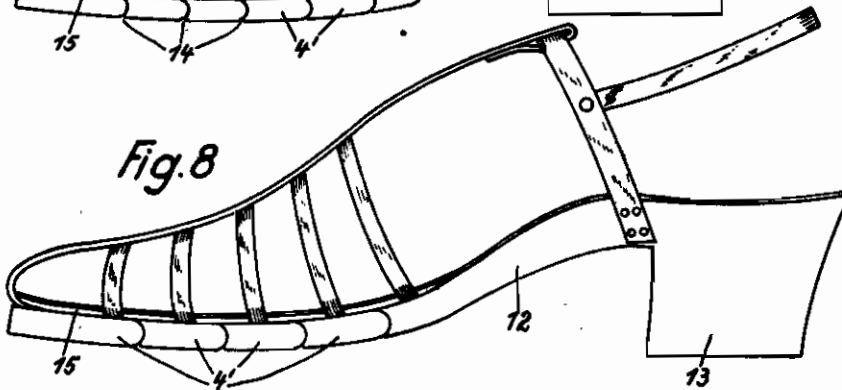
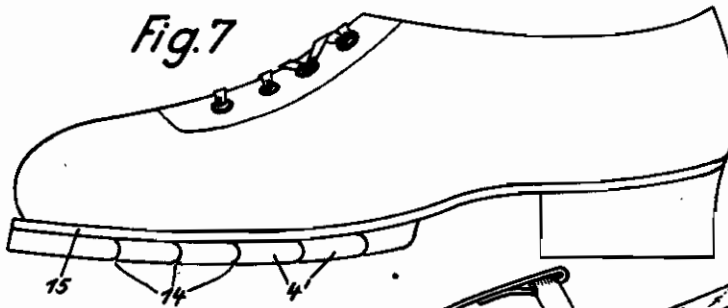
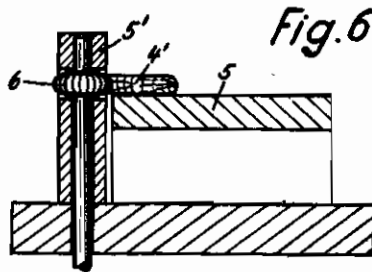
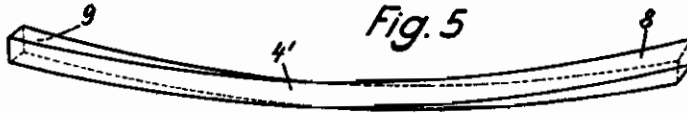
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ALIEN PROPERTY CUSTODIAN

SOLES FOR SHOES AND SANDALS

Paul Gelling, Berlin, Germany; vested in the
Allen Property Custodian

Application filed February 13, 1941

This invention relates to a method of producing soles for shoes and sandals from rigid materials, such as, wood and moulded materials, as distinct from easily flexible materials like leather and rubber, and to the products of this method.

It is an important object of the present invention to produce a sole from the materials above referred to which is bent to conform to the upper leather substantially like a leather or rubber sole.

Another object of the invention is to produce a sole from a rigid material which maintains its shape irrespective of the action of moisture and other weather conditions.

With these and further objects in view, as may become apparent from the within disclosures, the invention consists not only in the structures herein pointed out and illustrated by the drawings, but includes further structures coming within the scope of what hereinafter may be claimed.

The character of the invention, however, may be best understood by reference to certain of its structural forms, as illustrated by the accompanying drawings in which:

Fig. 1 is a perspective view showing one mode of producing sole sections of wood or other rigid material in accordance with the invention.

Fig. 2 is a side view of a machine for working the edges of such wooden sole sections.

Fig. 3 is a perspective view of a sole composed of a plurality of sections.

Fig. 4 is a perspective view of the same sole, viewed from another direction.

Fig. 5 is a side view of a sole section obtained from the sawing operation shown in Fig. 1, before its edges are machined.

Fig. 6 is a section on line VI—VI of Fig. 2.

Fig. 7 is a side view of a finished shoe showing the application of my novel sole.

Fig. 8 is a side view of a sandal or sandalette provided with my novel sole.

It has been proposed already to bend an integral wooden sole, or its sections, in one direction by subjecting the sole or sole sections to heat and high pressure. However, such a wooden sole very soon loses its curvature, when it is used, especially by the inevitable action of moisture.

The present invention contemplates the provision of a procedure for producing rigid soles or sole sections which have a special curvature and retain their bent shape in spite of moisture and other influences.

Broadly stated, the invention contemplates the production of the sole or sole sections from the raw material in the final shape which it is desired to have, without subsequent bending of the

material. In other words, the sole or sole sections are made in such a manner that they are originally obtained in the desired curved form without causing any structural tension tending to straighten the sole or sole section such as would be set up by a subsequent bending operation. In the practice of my invention, I cut curved sections of wood or other rigid material from a larger piece of the respective material; or, in the case of artificial materials which can be moulded, I may mould the sole or sole sections directly in their curved form.

The invention also contemplates the production of a sole or of sole sections with two curvatures, namely a first curvature in the direction in which the sole is tending to be bent when walking and a second curvature in the straight-forward direction of walking. To make that clear, reference will first be had to Figs. 3 and 5. In Fig. 3, the dot and dash line G—G indicates the direction in which the sole if flexible is bent, this sole being for a right shoe viewed from the top. The line G—G consequently lies at right angles to the line A—A indicating the direction of the abutting edges of the adjacent sole sections 4'. The dot and dash line L—L on the other hand indicates the direction of walking and, consequently, forms a median or center line connecting the point of the sole with the center of its rear edge 18. It has been found that it is desirable to shape the sole in such a manner that it is curved both in direction G—G and in direction L—L, which of course results in a skew or warped shape of each section 4', as shown, somewhat exaggerated, in Fig. 5. The complete sole thus conforms to the natural sole shape which a sole of a flexible material like leather or rubber will assume by itself as it is secured to the upper leather.

Where the sole sections 4' are to be made of wood or another rigid material which can be sawn, the device shown in Fig. 1 may be used for producing them. It consists of a base plate constituting, for instance, the working table 1 of a band saw 2 on which a wedge piece 3 having a curved slot 17 is mounted for sliding about a pivot 7. The distance r from the pivot 7 to the band saw 2 corresponds to the radius of the total curvature forming the resultant of the curvatures in the direction G—G and L—L, Fig. 3, respectively, while the angle α of the wedge member 3 is equal to the angle α formed between the lines L—L and G—G, Fig. 3. It will thus be understood that the curvature resulting by swinging the work piece 4 about pivot 7, together with wedge

member 3, is not parallel to the longitudinal edges 8 and 9 of the sole section 4', but it is normal to the line L—L, thus forming a skew or warped strip 4' as best shown in Fig. 5. The arrangement as shown is for the sole of a right shoe while for the sole of a left shoe the pivot should be provided at 7' to produce an opposite curvature using a wedge piece with curved slot 17'.

The strips 4' are now machined at their longitudinal edges, for instance, by means of a milling machine of the type shown in Figs. 2 and 6, comprising a bent work table or base 5 for reception of the strips 4' and a revolving milling cutter 6 which is of convex shape for cutting the concave edge of each strip, and concave for cutting the opposite convex edge of each strip, respectively. Advantageously, there is provided besides the work table 5 a stop or guide ledge 5'. This will facilitate the milling of the longitudinal edges 8 and 9 of the strips 4. The outer edges of the sole sections may be milled on a similar machine, using suitable gauges or templets (not shown). The elementary strips 4' are then assembled with their convex edges 9 fitting into the adjacent concave edges 8, as shown in Fig. 3, and may be provisionally held together in this assembled condition, for instance, by means of a sheet of paper (not shown) which is pasted preferably to the upper surface of the sole, until the sole is attached to the shoe, in the same or in another factory. Finally, the sole is secured to the inner sole or to the first sole 18 of the shoe or sandal, as shown in Figs. 7 and 8, for instance, by cementing, glueing, and/or nailing. As shown in Fig. 8, the intermediate member 12 of the shoe which

lies between its heel 13 and the sole sections 4' may be made to conform to the convex edge of the rearmost sole section 4' by a concave edge, or vice versa.

Where a mouldable material is used, such as, artificial resin, for instance, phenol formaldehyde condensation products, the sole sections may also be cut from a larger block, in the manner illustrated in Fig. 1, but advantageously the sole sections in this case are moulded directly in their ultimate shape, thus avoiding the sawing and milling operations. Other materials may also be used which can be shaped by sawing, cutting, or milling, or by moulding, pressing, casting or the like, provided that such materials are capable of withstanding the stresses and influences to which the sole of a shoe is exposed in its use.

Instead of composing the sole of sections, it is also possible to make integral soles which are then rendered flexible by suitable incisions applied at the points 14, Fig. 7. Where the soles are produced by moulding, the incisions may be provided in the moulding operation and the curvatures of the sole in all directions may also be produced in the moulding process.

The method and apparatus of the present invention have been described in detail with reference to specific embodiments. It is to be understood, however, that the invention is not limited by such specific reference but is broader in scope and capable of other embodiments than those specifically described and illustrated in the drawing.

PAUL GELLING.