Jan. 4, 1949. A. G. VLASTOS 2,457,944

VENTILATED SHOE

Filed July 10, 1947

FIG. 1.

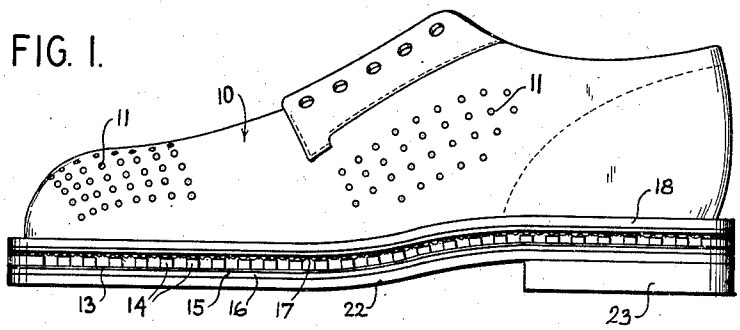


FIG. 2.

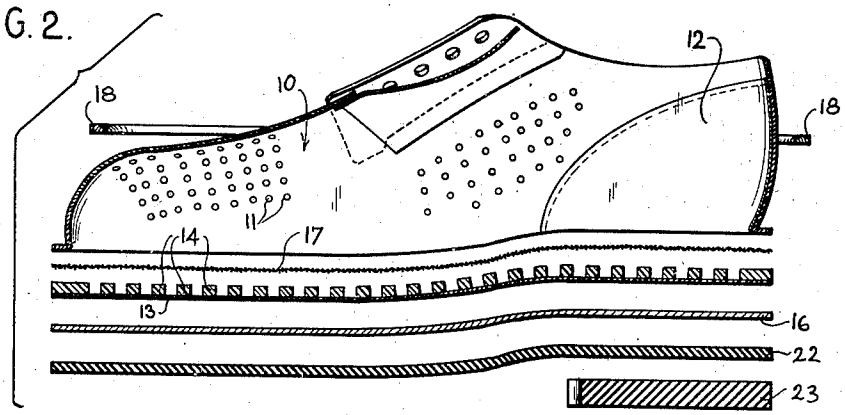
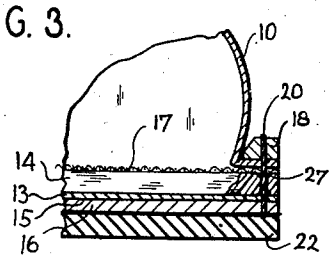


FIG. 3.



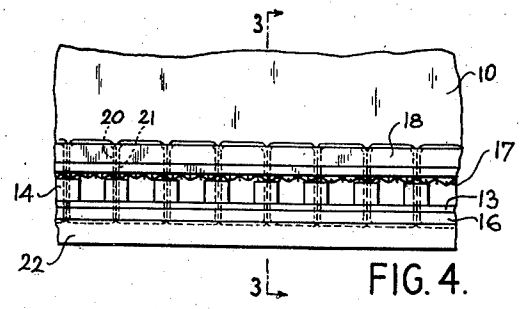
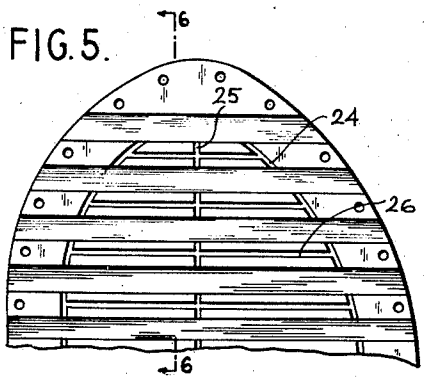


FIG. 4.

FIG. 5.



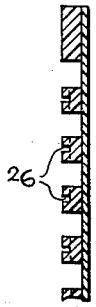


FIG. 6.

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VENTILATED SHOE

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8 Claims. (Cl. 36—3)

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This invention relates to ventilated shoes, and is herein described in some detail as embodied in a man's low shoe.

Many attempts have been made to provide better ventilated shoes so that perspiration may evaporate or be carried off rapidly, and considerable success has been attained in developing leathers which might be nearly water-proof and yet permit the rapid evaporation of perspiration. Some upper leathers have been produced which permit such evaporation through the uppers at nearly three-fourths the rate of evaporation from the bare foot, but sole structure presents a different problem.

According to the present invention, the problem of ventilating through the sole of a shoe may be completely solved.

In the most complete form herein illustrated, the sole of a shoe is formed of a bottom, which may be flat, and that bottom is stitched to the upper through an intervening resilient channelled spacing member or slip-sole provided with channels, preferably open at the edge of the sole.

In the form illustrated, the wearer's foot rests on an insole consisting of plastic netting resting on the ridges between the channels, so that the wearer's foot, through the interstices of the netting, and the channels, is exposed to the outer air.

The netting, preferably, extends out to the edge of the sole so that it forms an insole which is bound by the same stitching that holds the sole to the upper.

The spacing member may be made of a resilient plastic. Both cellulose acetate and Plexiglas have been found satisfactory, and was highly elastic and otherwise suitable when the channels were made by spaced ribs of one of the same plastics cemented crosswise of the sole, so that the ribs formed the ridges for supporting the insole.

The netting insole was found eminently satisfactory when made of plastic filament commercially sold mosquito netting having sixteen meshes to the inch, carried on flat-topped ribs about three-sixteenths of an inch wide and spaced about the same distance apart.

That structure was comfortable for most wearers of the shoe, and it adequately supported an extra thin felt insole, or a fairly rigid perforated sheet insole, if desired. The plastic netting may include central thread cores covered by the plastic.

The stitching which is shown holding the structure together may overlie a stiff outer welt which is rigid enough to hold down and keep in shape the edge of the vamp or upper, and the stitches

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shown pass through the welt, the edge of the upper, the insole, the ridges and through a sheet of rubber below the flat bottom of the slip-sole, to hold the rubber and channelled slip-sole to the upper.

Preferably, the rubber sheet is additionally cemented to the slip-sole. Then an outer sole, which has been found satisfactory if of ordinary flexible sheet rubber sold at retail, is cemented to the first rubber sheet.

The whole makes a strong reliable comfortable shot, adequately ventilated at the sale in all weathers, and, combined with a perforated top. or the above-mentionad ventilating upper leather, forms an almost perfect shoe for comfort and wear-resisting qualities.

In the accompanying drawings:

Fig. 1 is a side view of one form of shoe of the present invention.

Fig. 2 is an exploded sectional side view of the same.

Fig. 3 is an enlarged fragmentary section on the line 3—3 of Fig. 4.

Fig. 4 is an enlarged fragmentary side view of the vamp, the welt and the sole layers.

Fig. 5 is a top view of a modified slip-sole.

Fig. 6 is section on the line 6—6 of the parts shown in Fig. 5.

The shoe shown was made by cutting an upper vamp 10 to the desired shape, with three-thirty seconds of an inch spaced perforations 11 as shown, if desired, over a large part of the vamp. The inner counter 12 was stitched in at a suitable time and extended out as described below.

A sheet of suitable resilient flexible plastic 13, resistant to body heat and to moisture, was provided with cross ridges 14, spaced about three-sixteenths of an inch apart to form channels and of about the same width and height, by cementing suitable bars of the plastic on one face of the sheet 13. On the opposite flat face 15 was laid a sheet of commercial flexible red rubber 16 about one-eighth inch thick, and cemented down to it. Then a reticulated insole 17 of the above described mesh was laid on the upper faces of the ridges 14. The vamp 10 and counter 12 were laid around a last (not shown), if desired, so that their outer edges lay flat on the outer edge of the cut-to-shape slip-sole 13 and insole 17. Then a stiff welt 18, beveled on its inner edge, was laid on the edge of the vamp 10. Then the edges were stitched down by thread passing down through the center of the narrow welt 18, through the insole 17, the ridges 14 and the slip-sole 13 and the rubber sheet 16.

This bound the above described parts firmly together. The shoe shown was double sewed so that one up and one down thread **20**, **21** passed through each hole near the end of each ridge **14**, along the side, and at suitable intervals at the toe and heel where thicker bars are shown.

Then the outsole **22** was cemented on the red rubber **16**, and the shoe was complete, after attaching a suitable heel **23**.

It was possible to substitute other plastics and other flexible sheets and other insoles, but the above was satisfactory with a cellulose acetate sheet **13** about one-sixteenth of an inch thick and was producible with ordinarily available products readily obtained at retail.

If desired, additional side channels **24** and a center channel **25** running nearly fore and aft may be cut transversely of most of the ridges **14**. Also, alternatively or additionally, shallow top channels **26** may lie in the tops of the ridges **14**.

If the ridges forming channels are of cellulose acetate or Plexiglas or certain other plastics they repel water, and so are not easily wet, and thus tend to keep the feet dry even on wet streets. The additional channels **24** and **25** may leave ridges which take the form of spaced mounds to support the insole **17**.

The ridges **14** of the size and spacing described are suitable for heavy men's shoes. Other shoes will use smaller and narrower and closer ridges.

If the sheet **16** does not adequately guard the threads **20**, **21** from rough edges where they enter or leave the slip sole, the openings through which the stitches pass may be counter-sunk as at **27** or rounded off.

Having thus described in some detail one embodiment of the invention, what is claimed is:

1. A shoe including an insole formed of open mesh netting, a slip-sole of flexible resilient plastic having channels open to the netting and open at the sole edge, a rubber sheet outside the slip-sole, a welt above the insole, stitches passing through the welt and the sheet, and a wear sole cemented to the rubber sheet.

2. A shoe including an insole formed of open mesh netting, a plastic slip-sole carrying transverse ribs to form channels open at the edges of the sole and open to the insole, a rubber sheet below the insole, a stiff welt overlying the insole edge, stitches passing through the welt and through the ribs and through the sheet, and an outsole cemented to the slip-sole.

3. A shoe including an insole formed of open mesh netting, a water-repellent plastic slip-sole carrying spaced transverse cemented on ribs to form channels open at the edges of the sole and open to the insole, a rubber sheet below the insole, a stiff welt overlying the insole edge, stitches passing through the welt and through the ribs and through the sheet, and an outsole cemented to the slip-sole.

4. A shoe including a vamp and an insole formed of open mesh netting, a plastic slip-sole carrying transverse ribs to form channels open at the edges of the sole and open to the insole, a rubber sheet below the insole, a stiff welt overlying the vamp edge and the insole edge, stitches passing through the welt and through the ribs and through the sheet and an outsole cemented to the slip-sole.

5. A shoe including a vamp and an insole formed of open mesh netting, a water-repellent plastic slip-sole carrying spaced transverse cemented on ribs to form channels open at the edges of the sole and open to the insole, a rubber sheet below the insole, a stiff welt overlying the vamp edge and insole edge, stitches passing through the welt and through the ribs and through the sheet, and an outsole cemented to the slip-sole.

6. A shoe including a vamp and an insole formed of open mesh netting, a water-repellent plastic slip-sole carrying spaced transverse cemented on ribs to form channels open at the edges of the sole and open to the insole, a rubber sheet below the insole, a stiff welt overlying the vamp edge and insole edge, stitches passing through the welt and through the ribs and through the sheet, and a rubber outsole cemented to the slip-sole.

7. A shoe including an insole of plastic fine mesh netting, a plastic slip-sole carrying plastic-spaced mounds that support the netting and give access to open air at the sole edge, a flexible sheet below the slip-sole, a stiff welt overlying the insole edge, stitches passing through the welt and through the ribs and through the sheet, and a wear piece cemented to the slip-sole.

8. A shoe including a vamp and an insole of plastic fine mesh netting, a plastic slip-sole carrying plastic-spaced mounds that support the netting and give access to open air at the sole edge, a flexible sheet below the slip-sole, a stiff welt overlying the insole edge and the vamp edge, stitches passing through the welt and through the ribs and through the sheet, and a wear piece cemented to the slip-sole.

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