No. 625,393. Patented May 23, 1899.

E. B. HAFERTEPEN.

VENTILATED SHOE.

(Application filed Jan. 20, 1899.)

(No Model.)

Fig. 1.

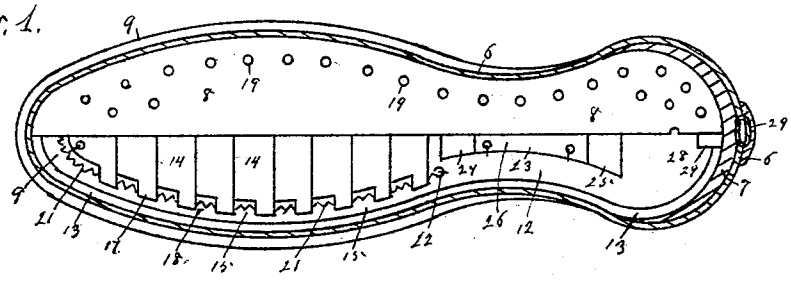


Fig. 2.

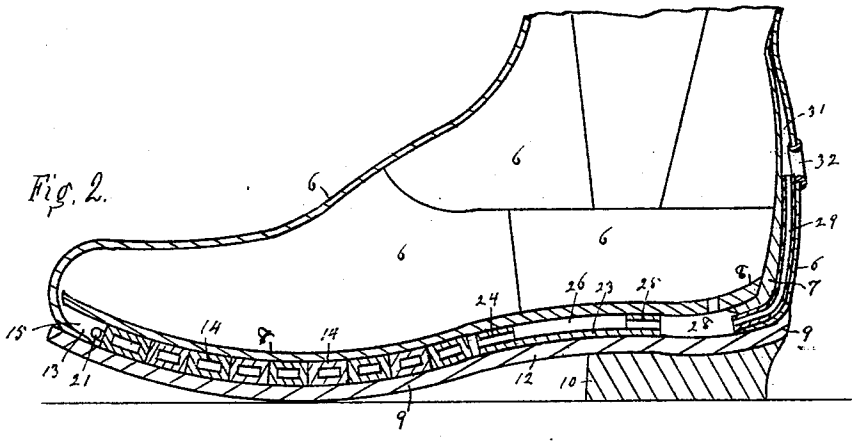


Fig. 3.

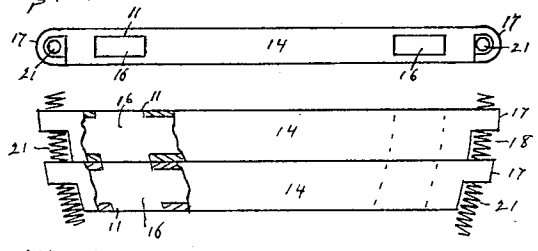


Fig. 4.

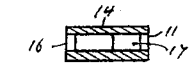


Fig. 5.

Witnesses,
L. Yeager
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By Robert S. Carr, Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWIN B. HAFERTEPEN, OF DAYTON, KENTUCKY, ASSIGNOR TO JEANETT HAFERTEPEN, OF SAME PLACE.

VENTILATED SHOE.

SPECIFICATION forming part of Letters Patent No. 625,393, dated May 23, 1899.

Application filed January 20, 1899. Serial No. 702,790. (No model.)

To all whom it may concern:

Be it known that I, EDWIN B. HAFERTEPEN, a citizen of the United States, and a resident of Dayton, Kentucky, have invented certain new and useful Improvements in Ventilated Shoes, of which the following is a specification.

My invention relates to ventilated shoes; and the objects of my improvement are to provide a middle sole formed of suitable metals and arranged to generate an electrogalvanic current, to provide passages therein for the free circulation of air, to provide perforations through the insole that communicate with said passages and with the interior of the shoe, to provide a vent-tube that leads from an air-chamber between the soles to the outside of the shoe, and to provide means to maintain lateral rigidity and permit longitudinal flexibility of the shoe-soles. These objects are attained in the following-described manner, as illustrated in the accompanying drawings, in which—

Figure 1 represents a plan with parts in section and a portion of the insole removed; Fig. 2, the longitudinal section of a shoe embodying my improvement; Figs. 3, 4, and 5, details of construction of the middle sole.

In the drawings, 6 represents the upper or vamp of a shoe, 7 the counter, 8 the insole, 9 the sole, and 10 the heel, all being arranged in the usual manner. The space formed in front of the shank 12, between the sole and the insole and bounded by the welt 13, contains the middle sole or ventilating-filling. Said middle sole consists of a series of rectangular hollow sections 14, placed with their edges adjacent to each other and transversely within said space. Said sections are formed of any suitable metal, but preferably of aluminium. By alternating copper sections with zinc sections a voltaic pile will be formed that will generate an electrogalvanic current with corresponding therapeutical benefit to the wearer. Each section is proportioned in length to that portion of the space it occupies, those toward the toe being shorter than those in the middle portion. The ends of the sections are open and terminate a short distance from the welt and parallel therewith to leave an air-passage 15 between the edge of the middle sole and the welt. The sections may be either open or seamless, as desired, and slots 11 are formed near each end and in both edges of each section. Said slots are arranged to register with the corresponding slots in the edges of adjacent sections to form an interior air-passage 16 around the middle sole and at a short distance from its edge. The hollow of the sections communicates at and near each end with the respective air-passages 15 and 16.

Eyes 17 are formed integral with and project from each end of the sections. They occupy only a portion of the width of the respective sections. Spaces 18 extend between the eyes on the corresponding end of adjacent sections and register with the respective perforations 19 in the insole.

A binding-spring 21, consisting of a coil of brass spring-wire, is inserted through the eyes and passed around the edge of the middle sole to bind the sections together and to form a flexible and extensible hinge or connection between them. The extremities of the binding-spring terminate through the eyes in the rearmost section and may be secured thereto or given a turn 22, adapted to engage a thread to fasten it to either the sole or insole, as desired.

Shank-plate 23 is narrower than the shank-opening between the soles wherein it is placed to permit the air to pass between its edges and the adjacent portions of the welt. The ends of said shank-plate terminate in short flattened channels 24 and 25, that open in the same longitudinal direction for the passage of the air therethrough and support the insole at the proper distance from the sole. Gap 26, between the terminal channels and above the middle portion of the plate, permits a limited vertical movement or spring to that portion of the insole that spans it. Said movement being imparted to the insole by the foot in walking agitates the air and contributes to more efficient ventilation. Chamber 28 is located over the heel and communicates with the rear channel in the shank-plate. It is intended to modify the temperature of the air admitted from the outside of the shoe through vent-tube 29 and before it passes to other portions of the shoe. The

heel portion of the insole is tightly stretched over chamber 28 and forms a soft springy support for the heel of the wearer in walking.

Vent-tube 29 is flattened in cross-section and communicates at one of its ends with chamber 28 and at its other end with a thin recess 31, situated some distance above the heel of the shoe and between the upper and the rear portion of the counter. An eyelet-opening 32 leads from recess 31 through the upper to the outside of the shoe and forms both an inlet and an outlet passage for the air to and from the shoe. By having the end of the vent-tube terminate through the upper or communicate directly with the eyelet-opening the thin recess 31 may be dispensed with.

In walking the longitudinal curvature of the shoe-soles increases and decreases alternately. The increase in the curvature separates the transverse metal sections from direct contact with each other. The separation of the sections is permitted by the stretching of the binding-spring, and its flexibility permits the sections to turn laterally in relation to each other to conform to the plane of curvature of the soles. When the curvature of the soles decreases, the adjacent edges of the sections impinge against each other. Where copper sections and zinc sections alternate, an electrogalvanic current is generated by their contact and broken by their separation, which results in making the current intermittent. The successive contact and separation of the sections and the diaphragm movement of the insole over the shank-plate and over the air-chamber above the heel serves to draw the air in and expel it through the vent-tube and the eyelet-opening. In this manner the air is thoroughly agitated and caused to circulate between all portions of the space between the sole and insole and through the perforations in the insole to the interior of the shoe for its thorough ventilation.

As the metal sections are inflexible they prevent any lateral curvature or bending of the soles and maintain an even surface laterally for the foot and for the outside wearing-surface of the sole.

Having fully described my improvement, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a sole and a perforated insole of a middle sole interposed between their front portions, said middle sole being formed of a series of transverse hollow metal sections and means adapted to movably connect said sections together.

2. The combination with a series of hollow metallic sections each being formed with open ends and with slots in its respective edges, said slots being arranged to register with corresponding slots formed in the edges of adjacent sections and eyes formed on the respective ends of the sections of an extensible binding-spring extending through the eyes and partially around the series of sections whereby they are separably and movably connected together.

3. The combination with a middle sole consisting of a series of hollow metallic sections movably connected together and communicating with each other through slots formed therein of a vent-tube and an air-passage communicating therewith and with the said middle sole.

4. A middle sole consisting of a series of rectangular hollow sections movably connected with their adjacent edges together, each of said sections being formed with open ends and with slots in its respective edges, each of said slots being arranged to register with a corresponding slot formed in the edges of adjacent sections of the series, whereby the air is permitted to pass from the interior of each section to the interior of the others.

5. A middle sole consisting of a series of metal sections separably and movably connected with their edges together, some of said sections being formed of copper and alternating with other of said sections formed of zinc, whereby an intermittent electrogalvanic current is generated by the successive contact and separation of the sections.

6. In a shoe the combination with a sole, a perforated insole and a flexible middle sole interposed between their front portions, said middle sole being formed of transverse hollow sections movably connected together of an air-chamber situated between the rear portions of said sole and insole, a vent-tube leading from the air-chamber to the outside of the shoe and a metal shank-plate terminating at each end in a flattened channel, said channels communicating with each other and with the air-chamber and the space occupied by the middle sole respectively.

EDWIN B. HAFERTEPEN.

Witnesses:
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