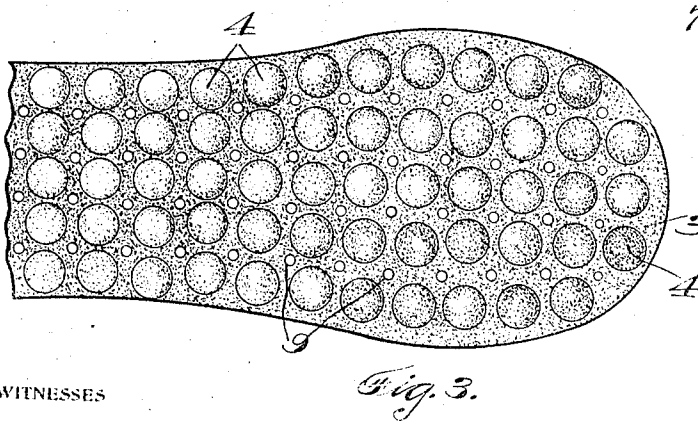
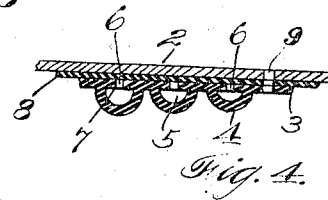
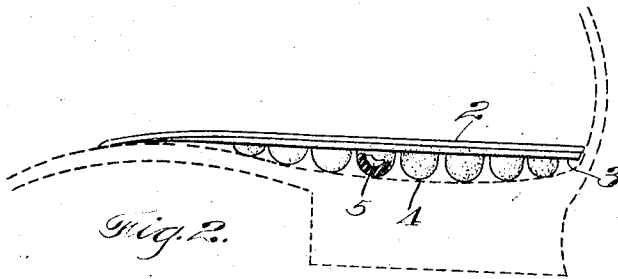
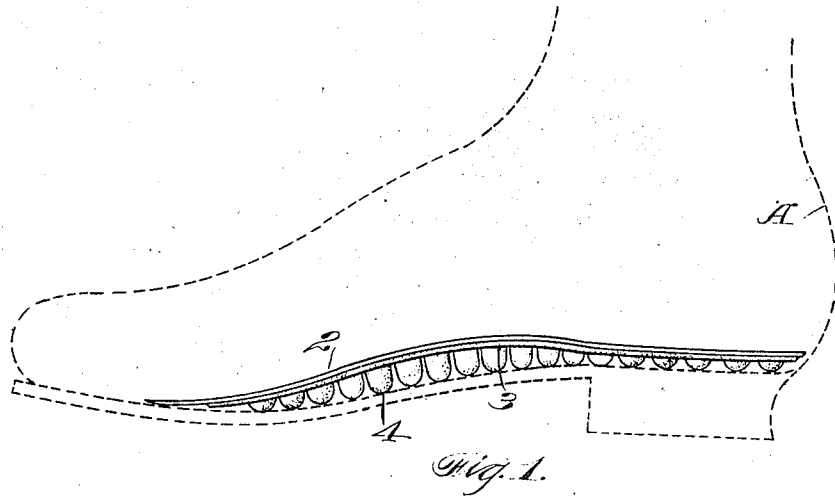


M. BYRNE.
PNEUMATIC INSOLE AND ARCH SUPPORT.
APPLICATION FILED OCT. 15, 1908.

1,044,015.

Patented Nov. 12, 1912



WITNESSES

F. E. Maynard
Witness

INVENTOR,
Matthew Byrne,
BY *Geo. H. Strong,*
his ATTORNEY

UNITED STATES PATENT OFFICE.

MATTHEW BYRNE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO INTERNATIONAL SPECIALTY COMPANY, A CORPORATION OF CALIFORNIA.

PNEUMATIC INSOLE AND ARCH-SUPPORT.

1,044,015.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed October 15, 1908. Serial No. 457,855.

To all whom it may concern:

Be it known that I, MATTHEW BYRNE, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Pneumatic Insoles and Arch-Supports, of which the following is a specification.

This invention relates to spring-heel and insole cushions for boots and shoes.

The object of the present invention is to provide a simple, cheap, practical insole attachment which will not only give the desired cushion effect provided ordinarily by rubber heels or the like, but will operate to give an artistic shape to flat-footed people, or people having very low insteps. In other words, the invention contemplates providing, in addition to a cushion heel, a cushion and support for the arch of the instep.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a view showing the insole as applied. Fig. 2 is a view showing the device as applied in the heel of a shoe. Fig. 3 is a bottom plan of the device. Fig. 4 is a detail section.

A represents a shoe of any sort to which the invention is applicable.

2 is a leather insole adapted to be inserted in the shoe and may extend the full length of the shoe, or, as shown in Fig. 1, only cover the heel and shank and a portion of the shoe occupied by the ball of the foot; or, as in Fig. 2, it may cover only the heel and extend a little way over the shank portion. My cushion attachment is preferably applied to this insole, which latter has sufficient thickness, stiffness and strength to maintain its shape properly in the shoe.

My heel cushion and arch support comprises essentially a rubber sheet 3 of suitable thickness, and of a shape conforming to the heel, or to the heel and shank, with a series of knobs or protuberances 4 on the under side of the sheet. These protuberances are formed with cavities 5, with a very small, restricted opening 6 on the top side of the sheet opening into these cavities after this cushion member has first been molded. The cavities of this cushion sheet

3 are preferably formed by using a mold having a series of headed pins, with the heads the shape of the finished cavity, and the shanks of the pins being approximately the size of the orifices 6. One feature of the present invention is that the diameter of a cavity 5 is considerably in excess of the diameter of its orifice 6, so as to provide a reinforcing flange 7 partially covering each cavity, this flange being integral with, and in the plane of, the body of the sheet 3. The object of forming these hollow knobs with the reinforcing flanges 7 is to provide as large an area as possible for the sealing rubber sheet 8 which is glued down on top of the sheet 3 to close the orifices 6 and hermetically seal the cavities or chambers 5; also, these reinforcing flanges 7, by reducing the size of the openings into the chambers 5, give strength to the cushion and prevent the sealing sheet 8 from being stretched as it would if the cavities 5 were open to their full diameter. Another thing is, these reinforcing flanges 7, with an original orifice 6 of minimum diameter, enable the cavity to be more perfectly sealed; and moreover, by increasing the body of rubber around the cavity without materially decreasing the air cushion in the cavity, gives additional resiliency and springiness to the support as a cushion. When the sealing sheet 8 has been glued or otherwise secured to the cushion sheet 3 so as to seal all the cavities 5, the sealing sheet is then pasted or otherwise secured to the under side of the insole 2; the length of the cushion sheet depending on the character of the spring support desired.

If it is desired to give artistic shape to an otherwise flat foot, the cushion sheet with its sealing sheet would be attached to an insole, and the cushion portion of the device would extend across the arch of the instep, and the length of the hollow knobs 4 beneath the arch would be made longer or shorter, according to the amount of arch desired or practicable to be given to the foot. In other words, in making an arch support of this sort, the knobs directly under the heel of the wearer might be shorter, gradually increasing in length as they come under those portions of the foot which should be raised, and the knobs then tapering off in length to the forward end of the cushion beneath, or adjacent to, the ball of the foot. Of course, with a perfectly

shaped foot all the knobs might be of the same length, and a cushion be provided just for the heel alone, or for the heel and arch of the instep, or for the whole foot; the combination of long and short knobs being only used where it is desired to raise certain parts of the foot, or relieve other parts. After the rubber cushion has been secured to the insole, the latter and the sheets 3 and 8 are perforated, as at 9, intermediate of the knobs, for the purpose of giving ventilation.

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

1. An improved cushion for the inside of a shoe, said cushion consisting of a flexible insole portion, a sheet of rubber secured to the under side thereof, a cushion sheet having a series of separated independent knobs on its under side, each of said knobs having its own cavity and said cavity having an opening through the top of the last named sheet, said opening being of less diameter than the diameter of the cavity in the knob so as to provide an integral flanged portion which surrounds each opening on all sides, said sheet with its knobs being secured to the sheet which is secured to the insole, and said last-named sheet forming a seal for said openings into said cavities.

2. A cushion for the inside of shoes, said cushion consisting of a flexible insole portion, a sheet of rubber secured to the under side thereof, a cushion sheet having knobs on its under side, said knobs being separate and distinct from each other and non-communicable and each having its own cavity, each of said cavities having an opening through the top of the cushion sheet and which openings are of less diameter than the diameter of the cavities, whereby an integral flanged portion overhangs each cavity and bounds the opening on all sides, said sheet with its knobs being secured to the sheet which is secured to the insole, said last-named sheet forming a seal for said openings into said cavities, and said sealing sheet and said cushion sheet being provided with coincident ventilating openings.

3. A cushion for the inside of shoes comprising a rubber cushion sheet, on the under side of which are knobs, said knobs having cavities which are otherwise entirely closed except for a restricted opening through the top of said sheet, said openings being of less diameter than that of the cavities, and a rubber sealing sheet secured to the top of said cushion sheet for hermetically closing said openings, said knobs of gradually increasing length from each end of said cushion toward the center thereof, being largest in the center, for forming an arch support.

4. A spring heel and arch support comprising a rubber cushion sheet extending over the heel and across the arch of the instep and having knobs on the under side in both the heel and arch areas, each knob having an internal air chamber hermetically sealed, and said knobs being of graduated dimensions to cause the surface of the sheet to conform to the shape of the foot.

5. A spring heel and arch support comprising a rubber cushion sheet extending over the heel and across the arch of the instep, said sheet having knobs on one side in both the heel and arch areas, each knob having an internal air chamber hermetically sealed, said knobs being of graduated dimensions and longest in the arch area to provide an arch support, and an insole overlaying and secured to the cushion sheet.

6. An arch support of flexible material shaped to fit within the heel portion and across the shank of a shoe and provided with an arch cushion formed by a series of projections, each having an independent internal air chamber with an opening of less diameter than the diameter of the chamber, and an attached sealing sheet bridging and closing said openings to form a series of independent hermetically sealed air chambers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MATTHEW BYRNE.

Witnesses:

CHARLES EDELMAN,
E. B. DAVENPORT.