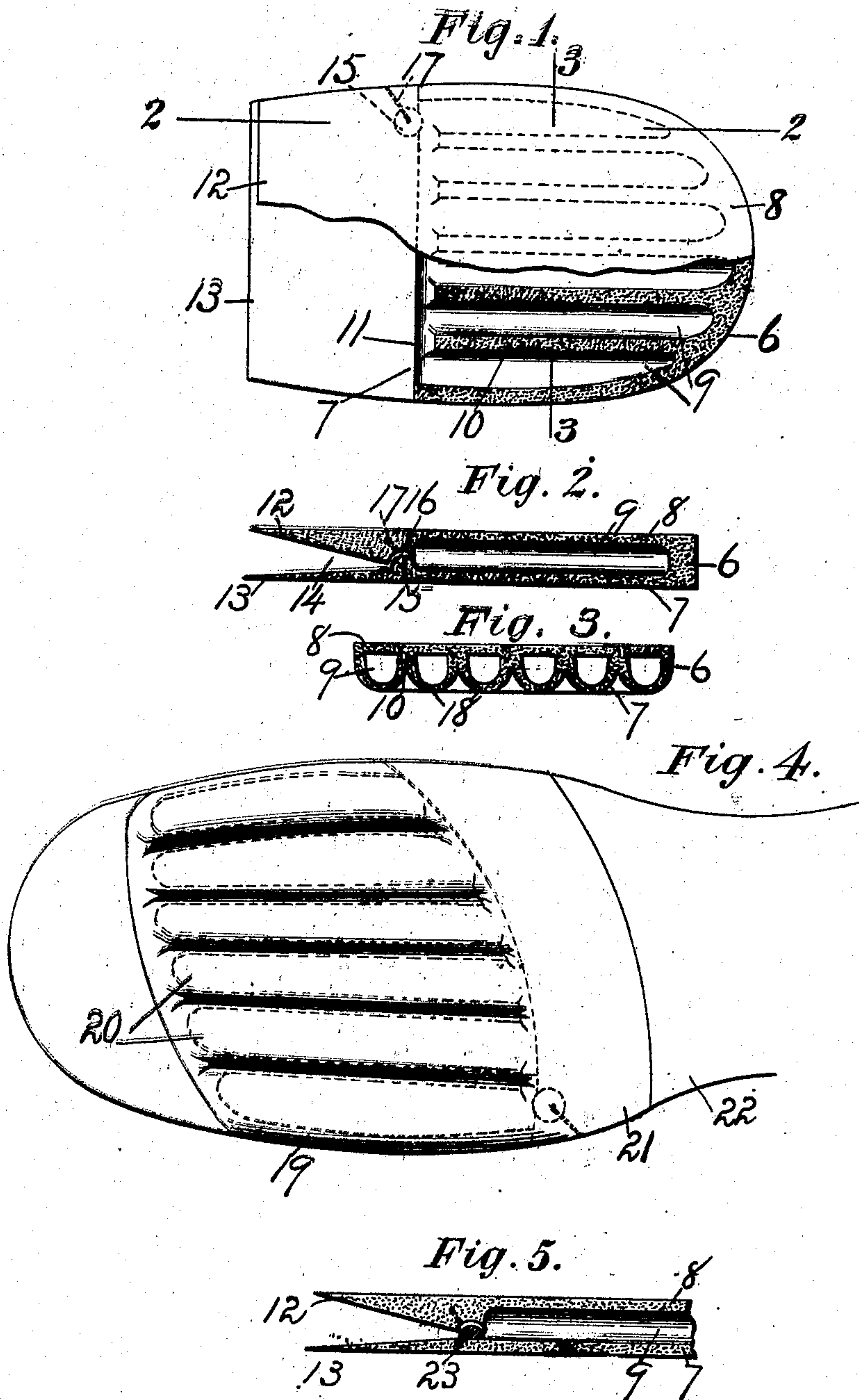


B. N. B. MILLER.
CUSHION FOR FOOTWEAR.
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900,867.

Patented Oct. 13, 1908.



WITNESSES:

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BENJAMIN N. B. MILLER, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented a certain new and Improved Cushion for Footwear, of which the following is a specification.

My invention relates to the class of devices for use in relieving the jar produced at the heel in walking, and the object of my invention is to provide a device of this class that may be readily applied to a shoe or like article of foot-wear; and a further object of the invention is to provide a device that may be practically constructed in an economical and efficient manner; and a further object of the device is to construct a cushion that shall properly support the foot at all points irrespective of the position of the foot of the wearer with respect to the shoe; and a further object of the invention is to provide means for supplying the cushion with compressed air.

A form of device in the use of which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a heel embodying my invention with parts broken away to show construction. Fig. 2 is a view in longitudinal section on plane denoted by line 2—2 of Fig. 1. Fig. 3 is a view in transverse section on plane denoted by line 3—3 of Fig. 1. Fig. 4 is an inverted plan view of a modified form of device to be used in the front part of a shoe. Fig. 5 is a view similar to Fig. 2 showing a modification in the valve.

My invention is especially applicable to a cushion designed to support the heel of a person, although it may be applied for the support of other portions of the foot in cases where a support may be so required.

In the accompanying drawings a structure embodying the invention as applied to a cushion for a heel includes a body or base 6 that is constructed of flexible material, preferably rubber molded to shape, this base 6 as a whole including a bottom 7 and a top 8. Channels 9 extend preferably lengthwise of the structure at suitable intervals, these channels being divided by walls 10 extending between and united to the top and bottom, being formed integral therewith. A channel 11 extends cross-wise of the struc-

ture, connecting all of the channels 9, this channel 11 being located preferably at one end of the channels 9. While I have shown and described the main channels 9 as extending lengthwise of the structure, and the cross channel 11 located at the end thereof, I contemplate various arrangements of the channels within the body part, and a communicating channel or channels between the main channels.

At one edge of the structure, preferably the forward end, when embodied in a heel, are formed two flaps, an upper flap 12 and a lower flap 13, the space or opening 14 between these flaps extending to the channel 11. On the inner surface of one of these flaps and within said opening, and preferably, as shown herein, on the upper surface of the lower flap 13, is formed a bulbous projection 15 arranged to fit within a recess 16 on the inner surface of the opposite flap, this recess being formed of such shape that the bulb 15 shall fit snugly therein. An aperture 17 is formed through the flap into the recess 16. The base 6 is preferably formed as to the under surface with ribs 18 within which the main channels 9 are located.

In Fig. 4 of the drawings I have shown an application of the invention as embodied in a support for the forward part of a foot, this consisting of a body part 19 having ribs 20 within which are located grooves or channels, and the rear end is constructed with an upper flap and a bottom flap 21, the whole attached to an insole 22. The general form of this structure is the same as that hereinbefore described with respect to the heel.

It will be noted that the improved cushion is formed of a single piece of rubber molded to shape, and in thus constructing the device a mold conforming to the outer final form of the cushion is provided, this mold including a core having fingers corresponding in shape to the channels 9, a cross-piece corresponding in shape to the channel 11 uniting said fingers and a web which forms the space or opening 14 extending inward from one end of the mold and which may form the means of attachment for the core to the mold.

The rubber is filled into the mold about the fingers, cross-piece and web in a manner which will be well understood by those familiar with this art, and after the rubber has

been subjected to proper treatment it is removed from the mold, whence it will be seen that by bending the flaps 12 and 13 backward away from each other the core may be easily withdrawn, producing the main channels, cross channels and openings as shown.

In completing the heel I employ a hollow needle with a perforated point which is inserted through the aperture 17. This needle is connected with some source of air supply under pressure and a cementing material having been applied to the meeting surfaces of the flaps 12 and 13 they are closed together, air is admitted through the needle passing into the channel 11 and thence into the channels 9. The cushion is thus supplied with air to any desired degree of pressure. When the desired pressure is obtained within the structure the needle is withdrawn and the bulb 15 pressed into the recess 16. The needle may also be supplied with means for finally introducing a cementitious material into the recess 16 just as the needle is withdrawn. The parts are now pressed firmly together and placed within a mold or press and the cementitious material permitted to set, whence it will be seen that a heel provided with air under pressure is obtained, this heel being practically a solid piece of rubber.

While I have shown one means of carrying out my invention, other means for embodying the same idea may be provided. In Fig. 5 the means for closing the opening through which air is supplied consists of a half ball 23, preferably constructed of rubber, this piece, and in fact the bulb 15 hereinbefore described, constituting valves operable in the act of supplying the air. As the air enters the structure the valve is forced away from the inlet opening, and when the desired pressure is obtained, by pressing the bulb or ball to its seat or place within the recess the air is prevented from escaping and this acts in the nature of a valve to maintain the pressure within the cushion.

Other variations are contemplated by me and I do not desire or intend to limit myself to the precise form of construction hereinbefore described.

It will be noted from this construction that the parts of the foot are firmly supported at all times, the action of the cushion being such that when added weight is applied to one side of the structure to compress it the air expelled from this part of the structure flows into that part underlying the portion of the foot under which weight has been released, and this portion of the cushion following the foot provides a firm support at all times, compression in one part of the structure causing an inflation at another part from the fact that the air can not escape. This, in fact, makes the cushion conform to the position of the foot with re-

spect to the shoe and always provides a firm support for all parts of the foot underneath which the cushion is located.

I claim—

1. An article of manufacture to be formed into a cushion for foot-wear including a body part formed of a single piece of flexible material molded to shape and having channels arranged to permit removal of a core and disposed practically throughout the whole of the body part, said cushion having an opening at the end of the structure extending into said channels and arranged to permit removal of a core from all of the channels.

2. An article of manufacture to be formed into a cushion for foot-wear including a body part formed of a single piece of flexible material molded to shape and having channels extending thereacross practically parallel each with the other and disposed practically throughout the whole of the body part, said cushion having an opening at the end of the structure extending into said channels and formed to permit removal of a core from all of the channels.

3. A cushion for foot-wear including a body part formed of a single piece of material and having channels closed at one end and extending lengthwise thereof and with flaps at the opposite end sealed together and closing a mouth extending into said openings.

4. An article produced in the formation of a cushion for foot-wear and including a body part formed of a single piece of material having main channels disposed with separating walls throughout all of the body part and with a communicating channel between the main channels, and an upper and lower lip having a slit or opening therebetween extending into said channels.

5. An article produced in the formation of a cushion for foot-wear and including a body part formed of a single piece of material with main channels extending in the same general direction and a communicating channel therebetween located at the end of the main channels, and upper and lower lips with a slit therebetween extending into said cross channels.

6. An article produced in the formation of a cushion for foot-wear and including main channels disposed throughout the body part and extending generally in the same direction, a cross channel located at the end of the main channels and communicating therewith, and an upper and lower lip having their inner surfaces terminating at said cross channel closed with a cementitious material.

7. An article produced in the formation of a cushion for foot-wear and including a body part formed of a single piece of material with main channels extending in the same general direction throughout the body part, a cross channel located at the end of

the main channels and communicating there-
with, upper and lower lips having their
inner surfaces terminating in said cross
channel closed with a cementitious material,
5 and a valve upon one of said meeting sur-
faces fitting a recess in the opposing meeting
surface.

8. An article produced in the formation
of a cushion for foot-wear and including a
10 body part formed of a single piece of ma-
terial having communicating channels ex-
tending in the same general direction and
with lips forming an opening extending
across the body part and into said channels,
15 said lips being formed to be secured together
to close the opening into the channels.

9. A cushion for foot-wear including a
body part having communicating channels

formed to permit removal of a core and with
lips forming an opening extending across 20
the body part and into said channels, said
lips being formed to be secured together to
close the opening into the channels.

10. A cushion for foot-wear including a
body part formed of a single piece of ma- 25
terial and having channels extending cross-
wise of the body part and terminating near
one end thereof, the opposite end having
flaps extending away from the openings and
in the same general line, and a cementitious 30
material located between the flaps securing
them together.

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Witnesses:

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