

INSOLE WITH INDIVIDUAL ELASTIC COMPONENTS

FIELD OF THE INVENTION

The present invention relates to a shoe component and more specifically to an insole with individual elastic components.

5 BACKGROUND OF THE INVENTION

Generally speaking, consumers will put elastic pads (insoles) inside shoes to increase flexibility and comfort, however, the conventional elastic pads are made of airproof materials so that even with ventilative layers disposed on top of the conventional elastic pads, odor will deliver from shoes due to poor air circulation and sweat.

10 Taiwan Utility Model Patent M422883, "A respiring elastic insole" disclosed a respiring elastic insole placed inside a shoe comprising a top layer, a middle layer, and a bottom layer where the middle layer is formed by a plurality of long hollow tubes disposed between the top layer and the bottom layer. Even though both lateral openings of the tubes are located at the toe portion and at the heel portion of the insole, however, 15 when the insole is pressed, the effect of ventilation will not affect the contact surface between the foot and the insole. Moreover, the deformation of the tubes is limited by the displacement of the elastic insole and is easy to crack. Only with a considerable displacement of the elastic insole, circulation inside a shoe caused by the elastic insole will become effective.

20 SUMMARY OF THE INVENTION

The main purpose of the present invention is to provide an insole with individual elastic components to generate ventilation and cushion once the insole is pressed to improve air circulation inside a shoe and to achieve automatically replenishment of air when the insole is not pressed.

25 According to the present invention, an insole with individual elastic components is revealed, primarily comprising a soft-elastic pad having a top surface and a bottom surface where a ventilative layer is adhered to the top surface. The bottom surface

includes a foot-thenar region, a heel region, and a foot-arch region where a supporting block is disposed at the heel region. The soft-elastic pad is formed in one body having a plurality of first hollow elastic pillars and a plurality of second hollow elastic pillars extended from the bottom surface with openings facing toward the top surface where the
5 first hollow elastic pillars are located within the foot-thenar region and the second hollow elastic pillars are located within the foot-arch region and each of a first extruded height of the first hollow elastic pillars and a second extruded height of the second hollow elastic pillars is greater than a third extruded height of the supporting block.

From the afore described ventilated solution, the insole with individual elastic
10 components revealed in the present invention has the following advantages and virtues:

1. Through a specific design combination of the height difference and locations of the first hollow elastic pillars, the second hollow elastic pillars, and the supporting block as a technical mean, when the insole is slightly pressed without deforming the supporting block at the heel region, the first hollow elastic pillars and the second hollow elastic
15 pillars will be firstly squeezed and deformed to force the air inside the first hollow elastic pillars and the second hollow elastic pillars to spurt upwards and out from the openings. When the first hollow elastic pillars and the second hollow elastic pillars are not pressed, the first hollow elastic pillars and the second hollow elastic pillars will return to their original shapes where air inside a shoe will refill into the first hollow elastic pillars and
20 the second hollow elastic pillars to make the insole so it functions with air cushion. Therefore, when the insole is pressed, functions of ventilation and cushion will become effective to improve air circulation inside a shoe.

DESCRIPTION OF THE DRAWINGS

FIG 1 is a three-dimensional component exploded view of an insole with individual
25 elastic components according to the preferred embodiment of the present invention.

FIG 2 is a three-dimensional view of the insole with individual elastic components according to the preferred embodiment of the present invention.

elastic pad 120 has a top surface 121 and a bottom surface 122 where a ventilative layer 110 is adhered to the top surface 121 of the soft-elastic pad 120. Normally, the ventilative layer 110 is made of leather such as ventilative leather or sheepskin or synthetic leather or ventilative cloth. The soft-elastic pad 120 can be made of silica gel or rubber to provide soft and elastic feeling to the user through the material characteristics and is formed in one body with all sorts of elastic gasbags. When ventilative leather is chosen for the ventilative layer 110 to provide good ventilation, the ventilative layer 110 can be adhered to the soft-elastic pad 120 through adhesive or thermal compression to form a compact structure in one body.

As shown in FIG 4, the bottom surface 122 includes a foot-thenar region 131, a heel region 132, and a foot-arch region 133 where the heel region 132 is corresponding to the contact portion of the insole 100 to the heel portion of a human foot, the foot-arch region 133 is corresponding to the contact portion of the insole 100 to the foot-arch portion of a human foot where the foot-arch portion is the arc portion of a human foot, and the foot-thenar region 131 is the region between the toe region and the heel region excluding the foot-arch region 133. A supporting block 125 is disposed at the heel region 132 to support a human foot. Preferably, the supporting block 125 is elastic and formed in one body with the soft-elastic pad 120 for easy manufacture and formation. As shown in FIG 3 and FIG 4, the supporting block 125 has a non-circular meshed groove to fully cover the heel region 132 to achieve better heel support.

As shown in FIG 3, in the present embodiment, a plurality of first slip-proof strips 126 are disposed at the edge of the bottom surface 122 of the soft-elastic pad 120 to prevent the insole 100 slipped inside a shoe. A plurality of second slip-proof strips 127 are disposed at the edges of the toe region on the bottom surface 122 of the soft-elastic pad 120 to prevent the insole 100 from slipping towards the toe of the shoe. In the present embodiment, the total area of the foot-thenar region 131 and the foot-arch region 133 can be defined and enclosed by the first slip-proof strips 126 and the supporting

block 125. Furthermore, the orientations of the second slip-proof strips 127 can be different from the orientations of the adjacent first slip-proof strips 126 to provide slip-proof function in different directions. To be more specific, the second slip-proof strips 127 are parallel to the corresponding toes of users to prevent the toe region to slip right and left and the second slip-proof strips 127 might further include extended arc strips. The first slip-proof strips 126 are arranged in dash format so that each length of the first slip-proof strip 126 is not greater than each length of the second slip-proof strip 127.

As shown from FIG 1 to FIG 5, the soft-elastic pad 120 is formed in one body with a plurality of first hollow elastic pillars 123 and a plurality of second hollow elastic pillars 124 disposed on and extruded from the bottom surface 122, each pillar has an opening facing toward the top surface 121 where the first hollow elastic pillars 123 are located in the foot-thenar region 131 and the second hollow elastic pillars 124 are located in the foot-arch region 133 as shown in FIG 3. Moreover, as shown in FIG 5, each of the first extruded height H1 of the first hollow elastic pillars 123 and the second extruded height H2 of the second hollow elastic pillars 124 is greater than a third extruded height H3 of the supporting block 125. The so-called “extruded height” means the vertical distance measured from the bottom surface 122 of the soft-elastic pad 120 to the tip of the extruded component. The third extruded height H3 of the supporting block 125 is measured from the edge of the most adjacent first hollow elastic pillars 123. To be more specific, the second extruded height H2 of the second hollow elastic pillars 124 is greater than the first extruded height H1 of the first hollow elastic pillars 123. In the present embodiment, the first extruded height H1 of the first hollow elastic pillars 123 ranges from 6 mm to 8 mm, the second extruded height H2 of the second hollow elastic pillars 124 ranges from 8 mm to 11 mm and the third extruded height H3 of the supporting block 125 ranges from 5 mm to 8 mm. Furthermore, preferably, as shown in FIG 5, a supporting surface of the supporting block 125 is slightly inclined to the first hollow elastic pillars 123 so that when the first hollow elastic pillars 123 are pressed and

deformed, the supporting surface of the supporting block 125 will be able to closely contact with the bottom of the shoe to increase the friction between the two.

Therefore, through a specific design combination of the height difference and locations of the first hollow elastic pillars 123, the second hollow elastic pillars 124, and the supporting block 125 as a technical mean of the present invention, when the insole 100 is slightly pressed without deforming the supporting block 125 at the heel region, the first hollow elastic pillars 123 and the second hollow elastic pillars 124 would be squeezed and deformed to force the air inside the first hollow elastic pillars 123 and the second hollow elastic pillars 124 to spurt upwards and out from their openings. When the first hollow elastic pillars 123 and the second hollow elastic pillars 124 are not pressed, the first hollow elastic pillars 123 and the second hollow elastic pillars 124 would return to their original shapes where air inside a shoe can refill into the first hollow elastic pillars 123 and the second hollow elastic pillars 124 to make the insole 100 with the function of air cushion. Therefore, when the insole 100 is pressed, functions of ventilation and cushion will become effective to improve air circulation inside a shoe.

Moreover, each first hollow elastic pillar 123 has a corresponding opening 123A and each second hollow elastic pillar 124 has a corresponding opening 124A facing toward the top surface 121 as shown in FIG 1. Preferably, the shapes of the first hollow elastic pillars 123 and the second hollow elastic pillars 124 are cones having flat circular tips to enhance the shape restoration of the first hollow elastic pillars 123 and the second hollow elastic pillars 124. Moreover, the ventilative layer 110 has a plurality of through holes 111 aligned with the openings 123A and 124A. Therefore, the first hollow elastic pillars 123 and the second hollow elastic pillars 124 become elastic structures with multiple airbags which will spurt air upwards and out from the openings. As shown in FIG 6, the insole 100 is installed inside a shoe 10 and will be pressed when a user is walking so that the first hollow elastic pillars 123 and the second hollow elastic pillars 124 will be repeatedly deformed and spurted air to the bottom of a human foot 20 or exerted upward

pressure as a counterforce to the bottom of human feet 20 to achieve air ventilation and cushion to the bottom of human feet 20.

5 Preferably, the diameter of the through holes 111 can be smaller than the diameter of the opening 123A and 124A to maintain the strength of the ventilative layer 110 and the contact surface to human feet 20. Moreover, the ventilative layer 110 has a plurality of ventilating holes 128 penetrating through the soft-elastic pad 120 and not aligned to the openings 123A and 124A to shorten the air flowing distance of the air outside the insole 100 from the first hollow elastic pillars 123 and the second hollow elastic pillars 124 to improve air circulation inside a shoe.

10 The above description of embodiments of this invention is intended to be illustrative but not limited. Other embodiments of this invention will be obvious to those skilled in the art in view of the above disclosure which still will be covered by and within the scope of the present invention even with any modifications, equivalent variations, and adaptations.

CLAIMS

What is claimed is:

1. An insole with individual elastic components primarily comprising a soft-elastic pad having a top surface and a bottom surface, wherein a ventilative layer is adhered to the top surface and the bottom surface includes a foot-thenar region, a heel region, and a foot-arch region, wherein the heel region has a supporting block, and the soft-elastic pad is formed in one body having a plurality of first hollow elastic pillars and a plurality of second hollow elastic pillars extruded from the bottom surface with the openings facing toward the top surface, wherein the first hollow elastic pillars are located within the foot-thenar region and the second hollow elastic pillars are located within the foot-arch region, wherein each of a first extruded height of the first hollow elastic pillars and a second extruded height of the second hollow elastic pillars is greater than a third extruded height of the supporting block.
2. The insole as claimed in claim 1, wherein the second extruded height of the second hollow elastic pillars is greater than the first extruded height of the first hollow elastic pillars.
3. The insole as claimed in claim 1, wherein the supporting block is elastic and is formed with the soft-elastic pad in one body.
4. The insole as claimed in claim 3, wherein the supporting block has a non-circular meshed groove.
5. The insole as claimed in claim 4, wherein the supporting block fully covers the heel region.
6. The insole as claimed in claim 3, wherein a supporting surface of the supporting block slightly inclines toward the first hollow elastic pillars.
7. The insole as claimed in claim 1, wherein the ventilative layer has a plurality of through holes aligned with the openings of the first hollow elastic pillars and the openings of the second hollow elastic pillars facing toward the top surface.

8. The insole as claimed in claim 7, wherein the diameter of the through holes are smaller than the diameter of the openings.
9. The insole as claimed in claim 7, wherein the ventilative layer has a plurality of ventilated holes penetrating through the soft-elastic pad without aligning to the openings of the first and second hollow elastic pillars.
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10. The insole as claimed in claim 7, wherein a plurality of first slip-proof strips are disposed at the edges of the bottom surface of the soft-elastic pad.
11. The insole as claimed in claim 10, wherein a plurality of second slip-proof strips are disposed on the side of the bottom surface of the soft-elastic pad facing toward a toe
10 region of the soft-elastic pad.
12. The insole as claimed in claim 1, wherein the first hollow elastic pillars and the second hollow elastic pillars are cones having flat circular tips.