An insole with improved internal air circulation is provided, including a cover layer and a main body, where the cover layer is a thin membrane made of leather skin, cloth, microfiber fabric, or composite material, and the main body is made from foam rubber, thermoplastic rubber, or flexible foam plastic. The body of the insole is provided with mixed pattern of channels and nodes on the surface, and a plurality of air vents evenly distributed on the bottom surface corresponding to the recessed areas of the channels and nodes, so that the air is able to circulate under the feet to help reduce heat and moisture accumulation in the wearer's shoes.
INSOLE WITH IMPROVED INTERNAL AIR CIRCULATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an insole with improved internal air circulation, and in particular to a unique shoe insole to promote foot comfort with air circulation under the feet, so that the heat and moisture accumulation around the wearer’s feet can be considerably reduced.

2. The Related Art

The insole is applied into the interior of shoes that allows the insole to conform to the contour of the sole of a particular wearer’s shoes to enhance comfort in wearing.

The main functions of the insole insert are to reduce the heat and moisture accumulation, and prevent impact related foot, leg and back strains, so that joins and spine can be more relieved. Some manufacturers claim that their insoles are able to control foot odor, while others claim that the general fitness and the circulation can be improved, and the risks for the germs to grow can also be lowered, after using their insoles for certain time.

There have been many different kinds of shoe insole available, using different materials and designs. Many of those may have some of the effects claimed by the original manufacturers, and yet research efforts to make more comfortable footwear and with orthopedic support for the foot have never ceased.

SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide an insole with improved internal air circulation, having air vents evenly distributed on the top and bottom surfaces, and mixed pattern of channels and nodes embedded in the body of the insole, so that air circulation is created under the feet to help reduce heat and moisture accumulation inside the wearer’s shoes.

In accordance with one aspect of the invention, the insole with improved internal air circulation is composed of a cover layer and a main body, where the cover layer is provided with air vents on the top surface, and the main body is embedded with mixed pattern of channels and nodes and a plurality of air vents evenly distributed on the bottom surface, corresponding to the recessed areas of the channels and nodes.

In accordance with another aspect of the invention, the main body of the insole is made from foam rubber such as polyurethane (PU) and ethyl vinyl acetate foam (EVA), or thermoplastic rubber (TPR), or flexible foam plastic. The composite materials for making the main body of the insole may be composed of two or more kinds of the above-mentioned materials.

In accordance with still another aspect of the invention, the cover layer of the insole is made of leather skin, cloth, microfiber fabric or composite material containing charcoal-based nanoparticles.

In accordance with still another aspect of the invention, the cover layer of the insole is provided with a plurality of air vents evenly distributed on the top surface.

In accordance with still another aspect of the invention, the insole embedded with nodes and channels and surface perforation is capable of producing air circulation under the feet. As a result of that, the heat and moisture accumulation around the wearer’s feet can be considerably reduced.

The present invention will become more obvious from the following description when taken in connection with the accompanying drawings, which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan top view of the present invention; FIG. 2 is a plan view of the main body of the insole in accordance with the present invention; and FIG. 3 is a perspective view of the main body of the insole.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawings and in particular to FIGS. 1 and 2, an insole 1 constructed in accordance with the present invention comprises a cover layer with surface perforation and a main body embedded with mixed pattern of nodes and channels to allow the air to circulate under the feet.

The cover layer of the insole 1 is provided with a plurality of air vents 2 evenly distributed on the top surface, and the main body of the insole 1 is embedded with mixed pattern of channels 3 and nodes 4 spreading across the entire surface area.

The cover layer of the insole 1 is a thin membrane made of leather skin, cloth, microfiber fabric, or composite materials containing charcoal-based nanoparticles.

The main body of the insole 1 is made from foam rubber, thermoplastic rubber (TPR), or flexible foam plastic, where the foam rubber material can be polyurethane (PU) or ethyl vinyl acetate foam (EVA). The composite materials for making the insole may be composed of two or more kinds of the above-mentioned materials.

Referring to FIGS. 2 and 3, the main body of the insole 1 is embedded with mixed pattern of air channels 3 and nodes 4 spreading across the entire surface area, and a plurality of air vents 2 evenly distributed on the bottom surface which correspond to the recessed areas of the channels 3 and nodes 4.

The pattern of nodes 4 is composed of an array of smaller circular nodes 41 and a large circular node 42, where the smaller nodes 41 are arranged close to the inner edge of the insole, and the large node 42 is located below the smaller nodes 41 corresponding to the ball of the foot, while all nodes 41, 42 are respectively connected with the channels.

The pattern of channels 3 is comprised of a plurality of channels spread across the entire surface area, where a major portion of the channels start from the nodes 41 disposed in the sole portion and extend to the heel, and then after turning around the heel the channels 3 skew to the edge on one of the two sides similar to the pattern of a tree,
and a minor portion of the channels 3 surrounding the large node 42 expand outward in concentric circles and cross over other channels 3 in their paths.

[0024] The air vents 2 on the bottom surface of the main body are evenly distributed, which correspond to the recessed areas of the channels 3 and nodes 4.

[0025] Whenever the body of the wearer moves such as walking or running, the foot step causes the surrounding air to be pumped into the internal space in the insole 1, which enters the insole 1 through the air vents 2 of the cover layer, and then passes through the channels 3 and nodes 4, and eventually exits through the air vents 2 on the bottom surface. This air circulation can reduce the heat and moisture accumulation in the wearer’s shoes so as to maintain a clean and dry condition under the sole.

[0026] To attain optimal effect from the air circulation, the pair of shoes in which a pair of insoles is applied also needs good ventilation, such as air vents on the vamp and around the bottom of the shoes, so that heat and moisture can be quickly dissipated through the perforated surface to the outside.

[0027] Although the present invention has been described with reference to the preferred embodiments thereof, it is apparent to those skilled in the art that a variety of modifications and changes may be made without departing from the scope of the present invention which is intended to be defined by the appended claims.

What is claimed is:

1. An insole comprising:

   a cover layer having a plurality of air vents on the top surface; and

   a main body being embedded with mixed pattern of channels and nodes, and a plurality of air vents evenly distributed on the bottom surface which correspond to the recessed areas of the channels and nodes.

2. The insole as claimed in claim 1, wherein the cover layer is a thin membrane made of leather skin, cloth, microfiber fabric, or composite material containing charcoal-based nanoparticles.

3. The insole as claimed in claim 1, wherein the main body of the insole is made of foam rubber, thermoplastic rubber (TPR), or flexible foam plastic.

4. The insole as claimed in claim 1, wherein the composite materials for making the body of the insole contains two or more kinds of materials including foam rubber, thermoplastic rubber (TPR) and flexible foam plastic.

5. The insole as claimed in claim 1, wherein a major portion of the channels extend in parallel from the sole to the heel, and after turning around the heel the channels skew to the edge on one of the two sides similar to the pattern of a tree.

6. The insole as claimed in claim 1, wherein a minor portion of the channels surrounding the large node expand outward in concentric circles and cross over other channels in their paths.

7. The insole as claimed in claim 1, wherein the pattern of nodes is comprised of an array of smaller nodes and a large node, where the smaller nodes are arranged close to the inner edge of the insole, and the large node is located below the smaller nodes corresponding to the ball of the foot, while all nodes are respectively connected with the channels.