AIR-VENTILATING INSOLE

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ABSTRACT

An air-ventilating insole comprises an upper insole; a center of the upper insole being formed with a receiving groove; a heel portion of the upper insole being formed with a plurality of air inlets and a front thener portion of the upper insole being formed with a plurality of air outlets; a lower insole located below the upper insole; an air chamber being formed; a plurality of spiral springs installed between the upper insole and lower insole; each spiral spring being formed as a truncated cone and further as the spiral spring is compressed to be on a same plane; one end of the spiral spring being formed with a U shape positioning end which is embedded into a respective U shape positioning slot of the upper insole; and a ventilating layer stuck above the upper insole at a position for contacting the bottom of the leg.
AIR-VENTILATING INSOLE

FIELD OF THE INVENTION

[0001] The present invention relates to insoles, and particular to an air-ventilating insole, wherein a plurality of spiral springs are distributed in an air chamber between an upper insole and a lower insole so as to have a preferred stability. Thereby, the insole has preferred arrangement of the air ventilating holes so that the shoe with the insole of the present invention can have preferred air ventilation effect.

BACKGROUND OF THE INVENTION

[0002] In the prior art shoe with air ventilating function has pumps or airbags or check valves or air guide tubes, etc. in the sole of the shoe for controlling air to flow unidirectionally. Since these devices have a larger volume, if they are installed in a shoe, other than the strength of the shoe being reduced, the user will feel uneasy. Thereby, the shoe cannot be washed in water.

[0003] To improve above mentioned defects, in U.S. patent Ser. No. 10/647,571, assigned to the inventor of the present invention, an air-ventilating insole is developed which can be placed in a shoe so as to have a preferred effect with a lower cost. In the prior arts, a plurality of spiral springs with smaller size are used. In the prior art, the spiral springs have a lateral round positioning ends. No positioning slots is formed. Thereby, the spiral springs will swing and vibrate so as to affect the air exchange function. Furthermore, the adhering structure by the upper insole, lower insole, and rubber strips to form an air chamber is easy to detach or destroyed so that air vents out.

SUMMARY OF THE INVENTION

[0004] Accordingly, the primary object of the present invention is to provide an air-ventilating insole, wherein the air outlets face upwards. It can be used in cold weather. If it is cold or no ventilation effect is necessary, the insole can be upside down and the left insole is exchanged with the right insole so that the air outlets face downward. As a result air in the air chamber is hindered in the air chamber. Thus the air chamber is used as an air inflation pad which has the effect of softness and protection.

[0005] To achieve above objects, the present invention provides an air-ventilating insole comprises an upper insole; a center of the upper insole being formed with a receiving groove; an enclosing frame enclosing the receiving groove; a plurality of U shape positioning slots being formed on the enclosing frame; a heel portion of the upper insole being formed with a plurality of air inlets and a front thinner portion of the upper insole being formed with a plurality of air outlets; a lower insole located below the upper insole; an air chamber being formed; a plurality of spiral springs installed between the upper insole and lower insole; the spiral springs being installed to the U shape positioning slots of the enclosing frame; each spiral spring being formed as a truncated cone and further as the spiral spring is compressed to be on a same plane; one end of the spiral spring being formed with a U shape positioning end which is embedded into a respective U shape positioning slot of the upper insole; a ventilating layer stuck above the upper insole at a position for contacting the bottom of the leg; a plurality of air input holes being formed in the ventilating layer, which are communicated to the air inlets. When the heel presses upon the insoles, the air inlets of the upper insole and the air input holes of the ventilating layer will compress air in the air chamber so as to flow upward to the front thinner portion of the user’s leg.

[0006] Moreover, in the present invention, if it is cold or no ventilation effect is necessary, the insole can be upside down and the left insole is exchanged with the right insole so that the air outlets face downward. As a result air in the air chamber is hindered in the air chamber. Thus the air chamber is used as an air inflation pad which has the effect of softness and protection.

[0007] The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is an exploded perspective view of the present invention.

[0009] FIG. 2 is an assembled perspective view of the present invention.

[0010] FIG. 3 is a plane schematic view of the present invention showing the treading operation of the present invention.

[0011] FIG. 4 is a plane cross section view showing the state that the leg is left from ground.

[0012] FIG. 5 shows the second embodiment of the present invention.

[0013] FIG. 6 shows the third embodiment of the present invention.

[0014] FIG. 7 shows one application of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0015] In order that those skilled in the art can further understand the present invention, a description will be described in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features, and characteristics of the present invention, but not to be used to confine the scope and spirit of the present invention defined in the appended claims.

[0016] Referring to FIGS. 1 and 2, the structure of the present invention is illustrated. The insole 1 of present invention includes the following elements.

[0017] An upper insole 11 is included. A center of the upper insole 11 is formed with a receiving groove 111. An enclosing frame 112 encloses the receiving groove 111. A plurality of U shape positioning slots 113 are formed on the enclosing frame 112. A heel portion of the upper insole 11 is formed with a plurality of air inlets 114 and a front thinner portion of the upper insole 11 is formed with a plurality of air outlets 115.

[0018] A lower insole 12 is located below the upper insole 11. An air chamber S is formed by the upper insole 11 and lower insole 12.
A plurality of spiral springs 14 are installed between the upper insole 11 and lower insole 12. The spiral springs 14 are installed to the U shape positioning slots 113 of the enclosing frame 112. Each spiral spring 14 has an upper plane and a lower plane a plurality of coils are wound between the upper plane and a lower plane. Thereby, the spiral spring 14 are formed as a truncated cone and further the spiral spring 14 can be compressed to be on a same plane. One end of the spiral spring 14 is formed with a U shape positioning end 141 which is embedded into a respective U shape positioning slot 113 of the upper insole 11 as the upper insole 11 and the lower insole 12 are adhered together. Thereby, the U shape positioning end 141 can be used to position the orientation of the spiral spring 14 so as to have the effect of enhancing the structure of the insole.

A ventilating layer 13 is stuck above the upper insole 11 at a position for contacting the bottom of the leg. A plurality of air input holes 131 are formed in the ventilating layer 13, which are communicated to the air inlets 114, but no air output holes are formed on the front thinner portion of the ventilating layer 13 for communicating the air outlets 115 of the upper insole 11. When the heel presses upon the insoles, the air inlets 114 of the upper insole 11 and the air input holes 131 of the ventilating layer 13 will compress air in the air chamber S so as to flow upward to the front thinner portion of the user’s leg.

Referring to FIGS. 3 and 4, when the user wearing the shoe with the insole of the present invention walks, the heel of user treads upon the insole, the air input holes 131 of the ventilating layer 13 and the air inlets 114 of the upper insole 11 are pressed by the heel so that the air in the air chamber S is compressed to flow out from the air outlets 115 of the upper insole 11 and the ventilating layer 13 to disperse in between the front thinner portion. When the leg of the user lifts, the air chamber S is restored by the resilient force of the spiral springs 14 so as to drive the external air to flow into the air input holes 131 of the ventilating layer 13 and the air inlets 114 of the upper insole 11. Therefore, since no air output hole is formed at the ventilating layer 13 corresponding to the front thinner portion, the compressed air will not easily flow into the air chamber S. Thereby, air flows unidirectionally. Thus the air chamber S has saturated cool air.

By the continuous treading actions, air within the shoe and external the shoe displace continuously so that the wet and hot air in the shoe can be ventilated preferably.

Referring to FIG. 5, another embodiment of the present invention is illustrated. The air-ventilating insole 1A: A ventilating layer 13A adhered to a front end of the receiving groove 111A of the upper insole 11A, so as to cover the air outlets 115 of the upper insole 11A. No spiral springs are installed upon the ventilating layer 13A; a plurality of spiral springs 14 are installed in the heel portion of the receiving groove 111A of the upper insole 11A. A leather layer or cloth layer 13B being adhered to the upper insole 11A; the leather layer or cloth layer 13B being formed with a plurality of air input holes 13B and air output holes 132 which are communicable to the air inlets 114 and air outlets 115 of the upper insole 11A.

As shown in FIG. 6, the third embodiment of the present invention is illustrated. A front end of the receiving groove 111 of the upper insole 11 is adhered with a ventilating layer 13A which only covers the front half of the insole 1 so as to cover the air outlets 115 of the upper insole 11. A plurality of spiral springs 14 are installed upon the ventilating layer 13A, so that the air out of the air chamber S of the upper insole 11 will not easily return to the air chamber S. Thus air flows unidirectionally. A plurality of spiral springs 14 are installed in the heel portion of the receiving groove 111 of the upper insole 11A at the upper insole 11A a leather layer 15 (or cloth layer) is adhered to the upper insole 11A. The leather layer or cloth layer 15 is formed with a plurality of air input holes 151 and air output holes 152 which are communicable to the air inlets 114 and air outlets 115 of the upper insole 11 so that cool air is filled in the air chamber S at any time for air ventilation.

Thereby, not only the treading force of heel can be buffered so that the shock of the heel is reduced, but also the wet and hot air within the shoe can circularly flow with external cool air to have a preferred air ventilation effect so as to avoid the effect of infection of bacteria or perspiration or getting foot tinea.

The advantages of the present invention will be described herein.

Since the spiral spring 14 has U shape positioning end 141 to be positioned to the U shape positioning slot 113 of the enclosing frame 112 of the upper insole 11, by the U shape structure of the U shape positioning end 141, the U shape positioning end 141 embedded into the enclosing frame 112 of the upper insole 11 can be used to determine the orientation of the spiral spring 14 to prevent the displacement of the spiral spring 14.

The material of the insole 1 is simple without any check valve or air guide tube. When the spiral springs 14 are compressed, the spiral springs 14 will be disposed at the same plane so that it is light and thin. Thus the user will feel comfortable.

The air chamber S within the insole 1 can contain more air so that air ventilation amount is great, which is suitable for leather shoes, cloth shoes, and other shoes. The insole 1 can be taken out easily.

A plurality of small size spiral springs 14 are used to replace a great spiral spring so that elastic force can be dispersed and a great resilient force generates. When the insole is pressed, it can restore easily so as to assure that air is saturated in the air chamber and the insole 1 will no need to destroy the structure thereof.

The hot and wet air within the shoe can be displaced with external cool air so as to avoid the effect of infection of bacteria or perspiration or getting foot tinea. Furthermore, the force applied to the sole can be buffered and have the effect of shock absorption.

Referring to FIG. 7, if it is cold or no ventilation effect is necessary, the insole 1 can be upside down and the left insole is exchanged with the right insole (see FIG. 3) so that the air outlets 115 face downwards. As a result air in the air chamber S is hindered in the air chamber S. Thus the air chamber S is used as an air inflation pad which has the effect of softness and protection.

The present invention is thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the
spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. An air-ventilating insole comprising:
   an upper insole; a center of the upper insole being formed with a receiving groove; an enclosing frame enclosing the receiving groove; a plurality of U shape positioning slots being formed on the enclosing frame; a heel portion of the upper insole being formed with a plurality of air inlets and a front thenar portion of the upper insole being formed with a plurality of air outlets;
   a lower insole located below the upper insole; an air chamber being formed by the upper insole and lower insole;
   a plurality of spiral springs installed between the upper insole and lower insole; the spiral springs being installed to the U shape positioning slots of the enclosing frame; each spiral spring having an upper plane and a lower plane; a plurality of coils being wound between the upper plane and a lower plane; whereby, the spiral spring being formed as a truncated cone and further as the spiral spring is compressed to be on a same plane; one end of the spiral spring being formed with a U shape positioning end which is embedded into a respective U shape positioning slot of the upper insole as the upper insole and the lower insole are adhered together; whereby, the U shape positioning end is used to position the orientation of the spiral spring;
   a ventilating layer stuck above the upper insole at a position for contacting the bottom of the leg; a plurality of air input holes being formed in the ventilating layer, which are communicated to the air inlets, but no air output holes are formed on the front thenar portion of the ventilating layer for communicating the air outlets of the upper insole; when the heel presses upon the insoles, the air inlets of the upper insole and the air input holes of the ventilating layer will compress air in the air chamber so as to flow upward to the front thenar portion of the user's leg.

2. The air-ventilating insole as claimed in claim 1, a ventilating layer adhered to a front end of the receiving groove of the upper insole; so as to cover the air outlets of the upper insole, no spiral springs are installed upon the ventilating layer; a plurality of spiral springs are installed in the heel portion of the receiving groove of the upper insole, a leather layer or cloth layer being adhered to the upper insole; the leather layer or cloth layer being formed with a plurality of air input holes and air output holes which are communicable to the air inlets and air outlets of the upper insole.

3. The air-ventilating insole as claimed in claim 2, a ventilating layer adhered to a front end of the receiving groove of the upper insole; so as to cover the air outlets of the upper insole, some of the spiral springs are installed upon the ventilating layer; a plurality of spiral springs are installed in the heel portion of the receiving groove of the upper insole, a leather layer or cloth layer being adhered to the upper insole; the leather layer or cloth layer being formed with a plurality of air input holes and air output holes which are communicable to the air inlets and air outlets of the upper insole.

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