



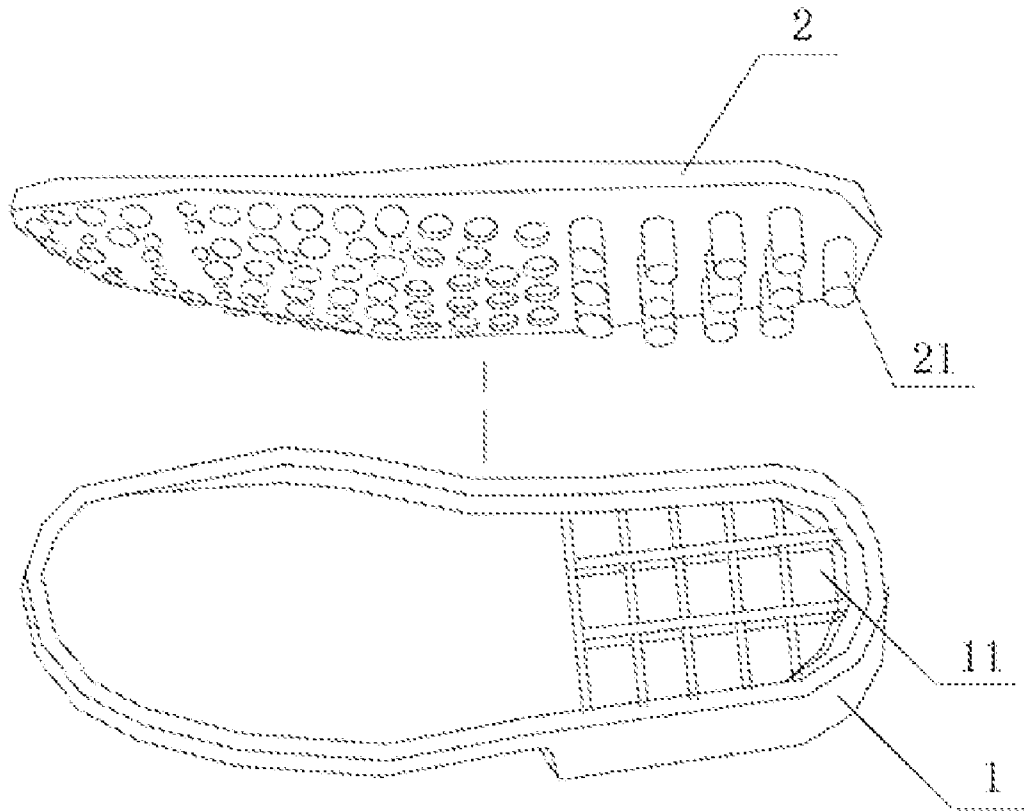
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(19) **United States**(12) **Patent Application Publication**  
**Propét**(10) **Pub. No.: US 2011/0232128 A1**(43) **Pub. Date: Sep. 29, 2011**(54) **SHOE SOLES WITH DAMPING FOOT PADS**(52) **U.S. Cl. .... 36/28**(76) **Inventor: Robert Propét, Auburn, WA (US)**(57) **ABSTRACT**(21) **Appl. No.: 13/121,184**

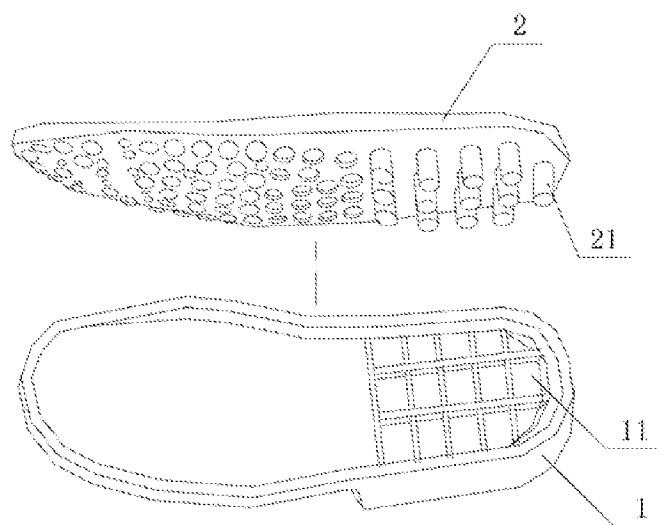
The invention relates to shoe soles with damping foot pads, which include a shoe sole and a foot pad. A plurality of convex columns with elasticity are evenly distributed on a lower surface of the foot pad, at a heel end. A plurality of grooves are arranged on an upper surface of the shoe sole, at the heel end to correspond to the convex columns, which are positioned in the grooves. A plurality of the convex columns with elasticity are evenly distributed on a lower surface of the foot pad. A plurality of the grooves include a plurality of the convex columns and are arranged on the upper surface of the shoe sole at the heel end to correspond to the convex columns. The evenly distributed elastic convex columns can evenly support the weight of the user but can also evenly and fully cushion the counterforce of impact on the heels by the ground, which avoids injury of the ankle joints, knee joints and other parts of the body by the counterforce of impact by the ground when the user performs physical exercise, such as walking, running and hopping. Shoes that adopt the structure of the invention effectively reduce the shake; furthermore, the user feels more comfortable, and does not ache or feel fatigue when walking for a long time.

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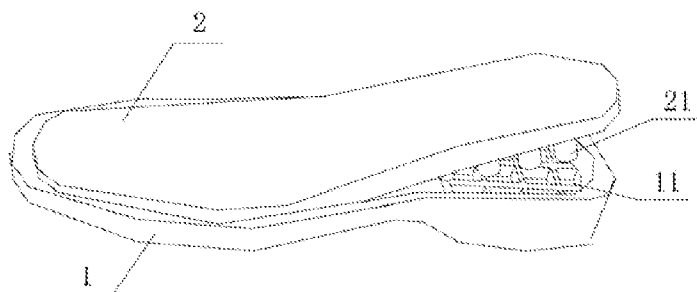
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**A43B 13/18** (2006.01)

**Fig. 1.**



**Fig. 2.**



## SHOE SOLES WITH DAMPING FOOT PADS

### THE FIELD OF THE INVENTION

[0001] The invention relates to the field of shoes, in particular to shoe soles with damping foot pads.

### THE PRIOR ART BEFORE THE INVENTION

[0002] When a user walks, the user's feet impact the ground. The counterforce of the ground transmits force from the feet (particularly the heels) to the legs, knee joints and even a plurality of parts of the user's upper body. Therefore, if the user walks for a long time, the impact force can make those parts, including the ankle joints and the knee joints ache. To solve the problem, shoes can be improved, such as the structure and the material, particularly the foot pads directly contacting the upper surfaces of the feet, which even become the goal of research. Leather foot pads or single jersey foot pads currently popular in the market can be relatively hard or thin, and are fail to meet the requirements of damping. Therefore, foot pads and the shoe soles which adopt elastic material to increase the thicknesses of the foot pads and cushion the impact force between the heels and the ground are found in the market.

[0003] For example, China patent application number ZL200720081783.6 discloses health care foot pads and shoe soles. Holes are respectively arranged at a fore end and a back end of the sole and blocks are respectively arranged on the lower surface of the foot pads corresponding to the two holes. The blocks are positioned in the holes. Although the blocks of the structure can reduce partial impact force, the single damping block on each end can only partially, and not comprehensively or evenly cushion the counterforce by the ground on the heels, as only one damping block with a relatively small sectional area is positioned at the back sole.

### THE PURPOSE OF THE INVENTION

[0004] Based on the above problems and shortcomings, the invention provides shoe soles with damping foot pads, which can comprehensively and evenly cushion the impact force between the heel of a foot and the ground, and increase the comfortability when the user walks.

### The Technical Scheme of the Invention

[0005] The technical scheme of the invention can be realized from the following description. A shoe sole with a damping foot pad includes a shoe sole and foot pad. A plurality of convex columns with elasticity are evenly distributed on a lower surface of the foot pad at a heel end. To guarantee the convex columns are not obliquely shifted when compressed and the foot pad is not moved relative to the shoe sole, a plurality of grooves are arranged on a lower surface of the heel end of the shoe sole to correspond to the convex columns, which are positioned in the grooves.

[0006] To allow the convex columns to be elastically compressed when the foot pads are treaded by the feet, the heights of the convex columns are taller than the depths of the grooves.

[0007] The foot pads are solely made from one of or a combination of various materials, such as elastic sponge, foamed plastic, rubber, polyester or polyether, which can produce certain elastic deformation under the gravity of the user's body.

[0008] The convex columns can be a plurality of shapes. For example, cross sections of the convex columns can be circular shapes, elliptical shapes, triangle shapes, square shapes, rectangle shapes, rhombus shapes or other shapes. The grooves can be square grooves or slotted holes that correspond to the shapes of the cross sections of the convex columns.

[0009] To improve comfort, the thicknesses of the foot pad is at least 5 mm and is manufactured with the convex columns.

[0010] A plurality of the convex columns are evenly distributed at the lower surface of the foot pad, on the heel end, and a plurality of the grooves containing the convex columns are arranged on the upper surface of the shoe sole, corresponding to the convex columns. The evenly distributed elastic convex columns can resist the weight of the user's body but can also fully and evenly cushion the counterforce of impact by the ground, which avoids injury of the user's ankle joints, knee joints and other parts of the user's body by the counterforce of impact by the ground when the user participates in athletic sports, such as long-time walking, running and hopping. Shoes manufactured with the structure of the invention can effectively reduce shake. Furthermore, wearing the shoes, the user will feel more comfortable, and not feel ache or fatigue when walking for a long time.

[0011] The invention is further illustrated by the figures as follows.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a schematic diagram of the structure of the invention.

[0013] FIG. 2 is a schematic diagram of the structure after assembly.

### EMBODIMENTS

[0014] FIGS. 1 and 2 refer to shoe soles with damping foot pads, which include a shoe sole 1 and a foot pad 2. A plurality of convex columns 21 with elasticity are evenly distributed on a lower surface, of the foot pad 2, on a heel end. Cross sections of the convex columns 21 are shaped as circular shapes, elliptical shapes, triangle shapes, rectangle shapes, square shapes, rhombus shapes or other shapes. A plurality of grooves 11 containing the convex columns 21 are arranged at the heel end of the shoe sole 1 on an upper surface and are corresponding to the convex columns 21. The grooves 11 can be arranged as square grooves or slotted holes that correspond to the shapes of the cross sections of the convex columns 21. Referring to FIG. 1, in one embodiment, the cross sections of the convex columns 21 are arranged as elliptical shapes. The grooves are arranged as square grooves. The heights of the convex columns 21 are taller than the depths of the grooves 11 to guarantee that the surface of the foot pad 2 is higher than the depth of the shoe sole 1 when the convex columns 21 of the foot pad 2 are positioned in the grooves 11. Therefore, the distance of elastic compression can be conveniently provided in the convex columns when the user treads on the foot pad 2. The foot pad is solely made from one of or a combination of various materials, such as elastic sponge, foamed plastic, rubber, polyester or polyether, which can produce elastic deformation under the weight of the body of the user. The foot pad 2 in one embodiment is made from elastic sponge.

[0015] A plurality of air holes are arranged at the front end of the foot pad 2 so air can be vented freely. The air holes can be air exit holes passed through the foot pad 2 or the grooves

of which opening ports face down. The thicknesses of the foot pad **2** is at least 5 mm and is manufactured with the convex columns **21**. One layer of soft leather or shoddy is affixed to a surface of the foot pad **2** to improve the comfort of wear.

[0016] The invention is described by referring to the embodiments. But does not mean that the description limits the invention. If the technicians in the field can foresee other equivalent changes by referring to the embodiments of the invention, the changes should be within the scope limited by the requirements of the claims.

1. Shoe soles with damping foot pads comprise shoe soles (**1**) and foot pads (**2**). The shoe soles are characterizes in that:

A plurality of convex columns with elasticity are evenly distributed at the lower parts of the heels of the foot pads (**2**). A plurality of grooves (**11**) containing the convex columns (**21**) are arranged at the positions of the upper parts of the heels of the shoe soles (**1**) corresponding to the convex columns (**21**).

2. The shoe soles with the damping foot pads of claim 1, wherein the heights of the convex columns (**11**) are bigger than the depths of the grooves.

3. The shoe soles with the damping foot pads of claim 1, wherein the foot pads (**2**) are solely made of or mixably made of elastic sponge, foamed plastic, rubber, polyester or polyether.

4. The shoe soles with the damping foot pads of claim 1 or 2, wherein the cross sections of the convex columns (**21**) are circular shapes, elliptical shapes, triangle shapes, square shapes, rectangle shapes or rhombus shapes.

5. The shoe soles with the damping foot pads of claim 1, wherein the grooves (**11**) are square grooves or slotted holes corresponding to the shapes of the cross sections of the convex columns (**21**).

6. The shoe soles with the damping foot pads of claim 1 or 3, wherein a plurality of air holes are arranged at the front ends of the foot pads (**2**).

7. The shoe soles with the damping foot pads of claim 1 or 3, wherein the thicknesses of the foot pads (**2**) are at least 5 mm and are manufactured as an integrity with the convex columns (**21**).

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