A shock absorbing and pressure releasing damper apparatus for a shoe insole, wherein the damper apparatus comprises: an upper board having a plurality of upper mounting portions on a bottom thereof; a lower board arranged at the bottom of the upper board and having a plurality of lower mounting portions corresponding to the upper mounting portions of the upper board on a top thereof; a plurality of elastic members arranged between the upper mounting portions of the upper board and the lower mounting portions of the lower board; a plurality of magnets arranged inside the upper and lower mounting portions of the upper and lower boards and at centers of the elastic members; wherein the damper apparatus further includes a shoe body having an insole portion with a concave portion; a pad is provided on a top of the damper apparatus. Accordingly, the damper apparatus rises and lowers as appropriate.
SHOCK ABSORBING AND PRESSURE RELEASING DAMPER APPARATUS FOR SHOE INSOLE

BACKGROUND OF THE INVENTION

1. Technical Field

The present invention is related to a damper apparatus capable of rising up and lowering down depending upon different reaction forces exerted on the damper apparatus provided at an insole portion of a shoe body, which is also able to immediately distribute and absorb different pressures exerted by the front and rear of the foot during walking, running and jumping as well as to generate air flows at the shoe insole.

2. Description of Related Art

To overcome the shortcoming of the prior art, the primary objective of the present invention is to provide a shock absorbing and pressure releasing damper apparatus for a shoe insole, which is capable of rising up and lowering down depending upon different reaction forces exerted on the damper apparatus provided at an insole portion of a shoe body to overcome drawbacks of the prior art.

The problem to be solved by the present invention is described below. Most people wear shoes to protect their feet from injuries. Under the weight of the human body, reaction forces exerted upon the feet by the ground during walking, running or jumping are conveyed from the feet to the knees, making such forces one to several times larger. However, conventional shoe structures mostly provide only one shoe insole at the bottom of the shoe with a view to achieving the wearing comfort and softness. However, due to the fact that such shoe insole is not of a compressive structure, as the user wears the shoe for walking, running and jumping, the shoe insole is incapable of rising and lowering according to the reaction forces; as a result, the reaction forces generated by the ground cannot be distributed and absorbed and there is no damping or protection effects at all. Such reaction forces transferred from the feet to the knees can cause serious damage thereto. Although there have been newly invented air-cushion shoes, such air-cushion shoes merely provide only an air-saturated air chamber, which can easily lose their functionalities as tiny rocks or foreign bodies penetrate there-through; in addition, as the shoe insoles of such shoes are subject to the forces exerted by the feet, their heights are still permanent and are not reducible, which means the shoe insoles cannot be adjusted according to different reaction forces exerted on the feet; as a result, when the shoe insoles are subject to different reaction forces, the shoes cannot effectively distribute and absorb the pressures. Consequently, the feet and knees are prone to injuries due to impacts. Furthermore, the shoe insoles of known shoes cannot generate air flows, and in consequence there is no exchange between the hot air from the feet and the ambient air; as a result, the insole of the shoes are stuffy and stinky, thereby reducing the practicability of the shoes.

SUMMARY OF THE INVENTION

To achieve the aforementioned objective, the present invention provides a shock absorbing and pressure releasing damper apparatus for a shoe insole, the damper apparatus comprising: an upper board, a lower board, a plurality of elastic members, and a plurality of magnets.

The upper board has a plurality of upper mounting portions on a bottom of the upper board.

The lower board is arranged at the bottom of the upper board and having a plurality of lower mounting portions corresponding to the upper mounting portions of the upper board on a top thereof.

The elastic members are arranged between the upper mounting portions of the upper board and the lower mounting portions of the lower board.

The magnets are arranged inside the upper and lower mounting portions of the upper and lower boards and at centers of the elastic members. The magnets have positive and negative polarities.

Furthermore, the upper board and the lower board of the present invention include a plurality of ribs.

Preferably, the upper mounting portions of the upper board and the lower mounting portions of the lower board of the present invention are of an outwardly protruding shape, and inwardly concave fixed spaces are disposed at inner and outer of the upper mounting portions of the upper board and the lower mounting portions of the lower board, respectively.

Preferably, the upper mounting portions of the upper board and the lower mounting portions of the lower board of the present invention are defined with inner and outer fixed spaces of a ladder inwardly concave shape.

Preferably, the elastic members of the present invention are springs.

Preferably, the magnetic polarities of the corresponding upper and lower mounting portions on the upper and lower boards of the present invention are of like poles repelling each other.

Furthermore, the damper apparatus operates in conjunction with a shoe body, and the shoe body includes an insole portion having a concave portion for receiving the damper apparatus.

Furthermore, the upper board of the present invention further includes a plurality of perforations.

Furthermore, the lower board of the present invention further includes a plurality of perforations.

Furthermore, a pad with perforations is disposed on the damper apparatus of the present invention.

Accordingly, the damper apparatus provided at the insole portion of the shoe body is able to rise up and lower down depending upon different reaction forces as well as to immediately distribute and absorb different pressures exerted by the front and rear of the foot during walking, running and jumping in addition to the generation of air flow at the shoe insole such that the shock absorbing and pressure releasing effects as well as the wearing comfort and air flows of the shoe can all be enhanced, which is novel and inventive and meets users’ need.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is an exploded view of the present invention;
FIG. 2 is a perspective view of the assembly of the present invention;
FIG. 3 is a cross sectional view of the assembly of the present invention;
FIG. 4 is an illustration of an embodiment showing the present invention in reaction with the shoe body.
FIG. 5 is an illustration of an embodiment showing the present invention in reaction with the shoe body having a pad therein.

FIG. 6 is an illustration of another embodiment showing the upper and lower mounting portions of the upper and lower boards of the present invention.

FIG. 7 is an illustration of an embodiment showing the present invention in FIG. 5 in reaction with the foot pressing downward.

DETAILED DESCRIPTION OF THE INVENTION

To assist the examiner in understanding the technical features, content, merits and the achievable effects of the present invention, the following provides a detailed description of the embodiments of the present invention along with the accompanied drawings; however, the drawings provided are for illustrative purposes only, which may not be presented in actual scales and exact configurations; in other words, the scales and configuration relationship shown in the drawings shall not be treated as limitations of the present invention for actual implementations.

Please refer to FIG. 1, FIG. 2, FIG. 3, FIG. 4 and FIG. 6 showing an exploded view of the present invention, a perspective view of an assembly of the present invention, a cross sectional view of an assembly of the present invention, an illustration of an embodiment of the present invention in reaction with a shoe body and an illustration of another embodiment of the upper and lower mounting portions of the upper and lower boards of the present invention respectively. In a preferred embodiment of the present invention, the shock absorbing and pressure releasing damper apparatus for a shoe insole comprises an upper board 21, a lower board 22, a plurality of elastic members 23 and a plurality of magnets 24.

The upper board 21 includes a plurality of upper mounting portions 211 on a bottom of the upper board 21; in this embodiment, the upper mounting portions 211 of the upper board 21 are of an outwardly protruding shape and are respectively defined with fixed spaces 2111, 2110 (as shown in FIG. 1, FIG. 2 and FIG. 3); however, the present invention is not limited to such shape as they can also be defined with fixed spaces 2111, 2110 (as shown in FIG. 6) of a ladder inwardly concave shape, which fall within the protection scope of the present invention. In addition, to allow the damper apparatus 2 of the present invention to have air flows therethrough, the lower board 22 can be further provided with a plurality of perforations 212, and to further increase its supports, a plurality of ribs 213 are arranged on a bottom of the upper board 21 but the present invention is not limited to such arrangement; in other words, they can also be provided on a top of the upper board 21 and they fall within the protection scope of the present invention.

The lower board 22 is disposed below the upper board 21. A plurality of lower mounting portions 221 corresponding to the upper mounting portions 211 of the upper board 21 is disposed on the lower board 22. In addition, the lower mounting portions 221 of the lower board 22 are of an outwardly protruding shape and are defined with fixed spaces 2211, 2210 (as shown in FIG. 1, FIG. 2 and FIG. 3) at the inner and outer thereof respectively; however, the present invention is not limited to such shape as they can also be defined with inner and outer fixed spaces 2211, 2210 (as shown in FIG. 6) of a ladder inwardly concave shape, which fall within the protection scope of the present invention. In addition, to allow the damper apparatus 2 of the present invention to have air flows therethrough, the lower board 22 can be further provided with a plurality of perforations 222, and to further increase its supports, a plurality of ribs 223 are provided on the lower board 22; in this embodiment, the ribs 223 are arranged on the lower board 22 but the present invention is not limited to such arrangement; in other words, they can also be provided on a bottom of the lower board 22 and they fall within the protection scope of the present invention.

The plurality of elastic members 23 are arranged between the upper mounting portions 211 of the upper board 21 and the lower mounting portions 221 of the lower board 22. In this embodiment, the elastic members 23 are springs; however the present invention is not limited to such springs as they can also be other types of elastic members 23 having elasticity, which fall within the protection scope of the present invention. When the upper and lower mounting portions 211, 221 of the upper and lower boards 21, 22 of the present invention are of the outwardly protruding shape and are defined with fixed spaces 2111, 2211, 2110, 2120 at the inner and outer thereof respectively, the elastic members 23 are arranged at an outer side of the upper and lower mounting portions 211, 221 of the outwardly protruding shape and at the outer of the fixed spaces 2110, 2210 (as shown in FIG. 1, FIG. 2, FIG. 3 and FIG. 4). When the upper and lower boards 21, 22 are defined with inner and outer fixed spaces 2211, 2210, 2110 and 2210 of the ladder inwardly concave shape, the elastic members 23 are arranged at the upper and lower mounting portions 211, 221 which are fixed spaces 2111, 2211, 2110 and 2210 of the ladder inwardly concave shape at the outer of the fixed spaces 2110, 2210 (as shown in FIG. 6).

The aforementioned plurality of magnets 24 are arranged inside the upper and lower mounting portions 211, 221 of the upper and lower boards 21, 22; and at the centers of the elastic members 23. The magnets 24 have positive and negative polarities, which are provided to generate repulsive forces on the upper and lower boards 21 and 22; the magnets 24 arranged on the upper and lower mounting portions 211, 221 of the upper and lower boards 21, 22 are of like poles repelling each other.

The damper apparatus 2 of the present invention operates in conjunction with a shoe body 1. The shoe body 1 includes an insole portion 11; the insole portion 11 has a concave portion 111 (as shown in FIG. 4) for receiving the damper apparatus 2.

The damper apparatus 2 can be placed into the concave portion 111 of the insole portion 11 of the shoe body 1, wherein a pad 3 (as shown in FIG. 5) with perforations 31 is disposed on the upper board 21 such that when the shoe body 1 is worn by a foot 4, the damper apparatus 4 is invisible from the outside of the shoe body 1, thereby not affecting the outer appearance of the shoe body 1. In addition, when the upper and lower boards 21, 22 react under pressure, since the outer and inner of the upper mounting portions 211 and the lower mounting portions 221 are provided with the elastic members 23 and the magnets 24 respectively, as the damper apparatus 2 is gently subject to the pressure, the elastic members 23 arranged on the outer side thereof react; when it is subject to further and stronger down-
ward forces, the elastic members 23 on the outer side would then be in effect together with the magnets 24 arranged inside in order to generate different reaction forces at different stages. Furthermore, since the pad 3 provided on the upper board 21 of the damper apparatus 2 include perforations 31, whereas the upper board 21 and the lower board 22 are also provided with perforations 212, 222, as the damper apparatus 2 is subject to forces to bring about ascending/descending compression, air flows are generated at the shoe body 1 (as shown in FIG. 7).

[0036] In view of the above, the damper apparatus 2 provided at the insole portion 11 of the shoe body 1 is able to generate different degrees of the rising and lowering of heights depending upon different reaction forces and is able to immediately distribute and absorb different pressures exerted by the front and rear of the foot 4 during walking, running and jumping as well as to generate air flows at the shoe inner bottom 11 such that the effects of shocking absorbing and pressuring releasing of the shoe are greatly enhanced in addition to the improved wearing comfort and air flows of the shoe body 1, which is not only inventive, practical to actual uses of the user but also of the above merits.

1. A shock absorbing and pressure releasing damper apparatus for a shoe insole, the damper apparatus comprising:

- an upper board having a plurality of outwardly protruding upper mounting portions on a bottom of the upper board;
- a lower board disposed below the upper board, and the lower board having thereon a plurality of outwardly protruding lower mounting portions corresponding to the upper mounting portions of the upper board;
- a plurality of elastic members arranged between the upper mounting portions of the upper board and the lower mounting portions of the lower board; and
- a plurality of magnets arranged inside the upper and lower mounting portions of the upper and lower boards and at centers of the elastic members, the magnets having positive and negative polarities.

2. The shock absorbing and pressure releasing damper apparatus according to claim 1, wherein the upper board and the lower board include a plurality of ribs.

3. (canceled)

4. (canceled)

5. The shock absorbing and pressure releasing damper apparatus according to claim 1, wherein the elastic members are springs.

6. The shock absorbing and pressure releasing damper apparatus according to claim 1, wherein the magnetic polarities disposed at the upper and lower mounting portions on the upper and lower boards are of like poles repelling each other.

7. The shock absorbing and pressure releasing damper apparatus according to claim 1, wherein the damper apparatus operates in conjunction with a shoe body, and the shoe body includes an insole portion having a concave portion for receiving the damper apparatus.

8. The shock absorbing and pressure releasing damper apparatus according to claim 1, wherein the upper board further includes a plurality of perforations.

9. The shock absorbing and pressure releasing damper apparatus according to claim 1, wherein the lower board further includes a plurality of perforations.

10. The shock absorbing and pressure releasing damper apparatus according to claim 1, wherein a pad with perforations is disposed on the damper apparatus.

11. A shock absorbing and pressure releasing damper apparatus for a shoe insole, the damper apparatus comprising:

- an upper board having a plurality of ladder inwardly concave shaped upper mounting portions on a bottom of the upper board;
- a lower board disposed below the upper board, and the lower board having thereon a plurality of ladder inwardly concave shaped lower mounting portions corresponding to the upper mounting portions of the upper board;
- a plurality of elastic members arranged between the upper mounting portions of the upper board and the lower mounting portions of the lower board; and
- a plurality of magnets arranged inside the upper and lower mounting portions of the upper and lower boards and at centers of the elastic members, the magnets having positive and negative polarities.

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