The present invention relates to a thorn-proof insole comprising an insole assembly and a plurality of joint assemblies and featuring in matching the shape change of the sole of a foot when the insole assembly is extended. The insole assembly includes four plates which are consecutively joined together. The joint of the first plate and the second plate is located between a user's toes and thenar, the joint of the second plate and the third plate is corresponding to the middle portion of the arch of foot, and the joint of the third plate and the fourth plate is located between the arch of foot and the heel portion. The four plates could be designed with the same thickness or with different thickness according to the requirement of its location. Each plate must be at least 0.5 mm thick, and each joint assembly includes at least two first sleeves, one second sleeve and one pin. The first sleeves and the second sleeve are respectively applied to make two adjacent plates join together.
THORN-PROOF INSOLE

FIELD OF THE INVENTION

[0001] The present invention relates to a thorn-proof insole, particularly to an insole having the function of thorn-proof. The insole is also flexible to match the shape of the user’s foot while a user is walking. This invention is designed for users to wear their shoes with much better comfort and safety.

BACKGROUND OF THE INVENTION

[0002] Based upon the concern of workers’ safety at commonly seen dangerous working places, such as construction sites or fields requiring moving heavy objects etc., workers not only need to secure the safety of their heads, but also need to protect their feet from danger as well. The prior art of security work shoes are equipped with hard hulls at the head portions of the shoes to protect user’s toes and to prevent user’s feet from being crushed by heavy objects. Nevertheless, nails or sharp objects are often scattered all over the floors of work places. The hard hulls of the shoes can only protect workers’ toes not to be crashed, but can’t protect the soles of their feet not to be nailed.

[0003] The present invention is designed to improve the disadvantages of the security work shoes of the prior art as mentioned above. The prior art has a piece of metal insole, referring to FIG. 13 for its mechanism, and it is mainly a shoe-pad 50 which is made of one piece of metal with an inflexible thickness. The shoe-pads 50 are placed within the work shoes to protect the soles of a worker’s feet from injury such as pricked by nails, metal thorns or any other sharp objects. Because the shoe-pad 50 is an inflexible one-piece metal, it will not be able to adapt to the curve change of one’s foot and its stiffness will make the sole of the foot feel uncomfortable while the user is walking. Especially when the user is climbing or trampling on a scaffold or other uneven surfaces, it will cause extreme inconvenience for the user to proceed his duty.

SUMMARY OF THE INVENTION

[0004] The object of the present invention is to provide a kind of insole which is thorn-proof and is designed for users to wear their shoes with much better comfort and safety.

[0005] In order to achieve the foregoing object, the present invention is designed to comprise an insole assembly and a plurality of joint assemblies featuring in matching the shape change of the sole of a foot when the insole assembly is extended. The insole assembly includes four plates which are consecutively joined together. The joint of the first plate and the second plate is located between a user’s toes and thenar, the joint of the second plate and the third plate is corresponding to the middle portion of the arch of foot, and the joint of the third plate and the fourth plate is located between the arch of foot and the heel portion. The four plates could be designed with the same thickness or with different thickness according to the requirement of its location, and each plate must be at least 0.5 mm thick. Each joint assembly includes at least two first sleeves, one second sleeve and one pin. The first sleeves and the second sleeve are respectively applied to make two adjacent plates join together as a one-piece product.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is an exploded perspective drawing of the present invention;

[0007] FIG. 2 is an assembled perspective drawing of the present invention;

[0008] FIG. 3 is a top view of the present invention;

[0009] FIG. 4 is a cross-sectional view taken along line A-A in FIG. 3;

[0010] FIG. 5 is an enlarged drawing taken along circle B in FIG. 4;

[0011] FIG. 6 is a side view of the present invention being exercised;

[0012] FIG. 7 is an exploded perspective view of the embodiment in accordance with the present invention;

[0013] FIG. 8 is an exploded perspective view of the second embodiment in accordance with the present invention;

[0014] FIG. 9 is an assembled perspective view of the second embodiment in accordance with the present invention;

[0015] FIG. 10 is a top view of the second embodiment in accordance with the present invention;

[0016] FIG. 11 is a cross-sectional view taken along line A-A in FIG. 10;

[0017] FIG. 12 is an enlarged drawing taken along circle B in FIG. 11; and

[0018] FIG. 13 is a perspective schematic drawing of an insole of a prior art.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] Referring to FIG. 1 and FIG. 2, the mechanism of the thorn-proof insole comprises an insole assembly 10 and a plurality of joint assemblies 20 featuring in matching the shape change of the sole of a foot when the insole assembly 10 is extended. The insole assembly 10 includes four plates 11a/11b/11c/11d which are consecutively joined together. The joint of the first plate 11a and the second plate 11b is located between a user’s toes and thenar, the joint of the second plate 11b and the third plate 11c is corresponding to the middle portion of the arch of foot, and the joint of the third plate 11c and the fourth plate 11d is located between the arch of foot and the heel portion. The four plates 11a, 11b, 11c and 11d could be designed with the same thickness or with different thickness according to the requirement of its location. Each plate must be at least 0.5 mm thick and be made of metal such as iron or alloy.

[0020] Each joint assembly 20 includes at least two first sleeves 20a, at least a second sleeve 20b and a pin 30. The first sleeves 20a and the second sleeve 20b are respectively applied to make two adjacent plates 11a/11b/11c/11d join together as a one-piece product shown as illustrated in FIG. 1 and FIG. 2.

[0021] Referring to FIG. 3 to FIG. 5, the first sleeves 20a and the second sleeve 20b of each joint assembly 20 are crosswise interlocked and arranged in line, so the pin 30 can be inserted for every two adjacent plates 11a/11b/11c/11d to be joined together. Therefore, these four plates 11 are interlinked to form a one-piece insole which can be placed into all kinds of work shoes. When a user is walking, the insole assembly 10 will be able to adapt to the curve change of the user’s foot. Not only can it prevent the foot from being pricked, but also make the user feel comfortable while the user is walking.

[0022] Referring to FIG. 6, because the insole assembly 10 is composed of four plates 11a/11b/11c/11d, it is able to adapt to the curve change of a user's foot and to make the user feel much safer and more submissive when the insole assembly 10 is placed within a work shoe for the user to wear and to walk.
[0023] Referring to FIG. 7, at least one spacer 12 can be added under or on the top of the insole assembly 10. Each spacer 12 is made of cushion material. It allows the user’s foot to feel more comfortable and reduces the cold or stiff feeling caused by the metal-made insole assembly 10.

[0024] Referring to FIG. 8 to FIG. 12, the second embodiment of the present invention comprises an insole assembly 10 and a plurality of joint assemblies 20 featuring in matching the shape change of the sole of a foot when the insole assembly 10 is extended. The insole assembly 10 includes four plates 11a,11b,11c,11d which are consecutively joined together. The joint of the first plate 11a and the second plate 11b is located between a user’s toes and thenar, the joint of the second plate 11b and the third plate 11c is corresponding to the middle portion of the arch of foot, and the joint of the third plate 11c and the fourth plate 11d is located between the arch of foot and the heel portion. The four plates 11a,11b,11c,11d could be designed with the same thickness or with different thickness according to the requirement of its location. Each plate must be at least 0.5 mm thick and be made of metal such as iron or alloy.

[0025] Each joint assembly 20 includes at least two first sleeves 20a, one second sleeve 20b and one pin 30. The first sleeves 20a are extended from a first joint piece 22 and the second sleeve 20b is extended from a second joint piece 21. On the first joint piece 22 and the second joint piece 21 is a plurality of first rivet holes 222,212 which are corresponding to a plurality of second rivet holes 111 drilled on the plates 11a,11b,11c and 11d. Each first rivet hole 222 and its corresponding second rivet hole 111 is interlocked by a rivet 40 to fix them together. Therefore, the first sleeve 20a and the second sleeve 20b can be interlocked with the plates 11a,11b,11c,11d by adding the first joint piece 22, the second joint piece 21 and the rivets 40.

[0026] Referring to FIG. 10 to FIG. 12, in the second embodiment of the present invention, the first joint piece 22 and the second joint piece 21 are respectively attached to two plates 11a,11b,11c,11d that are designated to be linked together. Each first rivet hole 222 is locked with its corresponding second rivet hole 111 by inserting a rivet 40 whose both ends are pressed to make the first joint piece 22 and the second joint piece 21 be rivet joined with the plates 11a,11b,11c,11d, and then the first sleeves 20a and the second sleeve 20b of each joint assembly 20 are crosswise interlocked and arranged in line. The pin 30 is inserted through the first sleeves 20a and the second sleeve 20b of each joint assembly 20 to be joined together. Therefore, these four plates 11 are interlinked to form a one-piece insole which can be placed into all kinds of work shoes. In addition, in the embodiment of the present invention, the plurality of the plates 11a,11b,11c,11d can be made of iron, alloy, compound material of metal and nonmetal or compound material of nonmetal. The feature of the present invention is to prevent one’s feet from being injured by nails or thorns.

[0027] The advantages of the thorn-proof insole invented are:

[0028] The insole assembly 10 being composed of a plurality of plates 11 which is made of thorn-proof material; the insole assembly 10 not only being able to prevent the user’s foot from injury but also being able to adapt to the curve change of the user’s foot and make the user feel much safer and more comfortable.

[0029] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention. What is claimed is:

1. A thorn-proof insole comprising an insole assembly and a plurality of joint assemblies, featuring in matching the shape change of the sole of a foot when the insole assembly being extended, the insole assembly including four plates which are consecutively joined together, the joint of the first plate and the second plate being located between a user’s toes and thenar, the joint of the second plate and the third plate being corresponding to the middle portion of the arch of foot, the joint of the third plate and the fourth plate being located between the arch of foot and the heel portion, each plate being at least 0.5 mm thick, each joint assembly including at least two first sleeves, at least a second sleeve and a pin, and the first sleeves and the second sleeve being respectively applied to make two adjacent plates join together.

2. The thorn-proof insole as claimed in claim 1, wherein the first sleeves and the second sleeve are respectively applied to make two adjacent plates join together as a one-piece product.

3. The thorn-proof insole as claimed in claim 1, wherein the first sleeves of each joint assembly are extended from a first joint piece and the second sleeve is extended from a second joint piece, the first joint piece and the second joint piece being respectively provided a plurality of first rivet holes which are corresponding to a plurality of second rivet holes drilled on the plates, each first rivet hole and its corresponding second rivet hole being interlinked by a rivet to fix them together, and the first sleeve and the second sleeve being interlocked with the plates by adding the first joint piece, the second joint piece and the rivets.

4. The thorn-proof insole as claimed in claim 1, wherein the plate is made of iron.

5. The thorn-proof insole as claimed in claim 1, wherein at least a spacer is added under or on the top of the insole assembly and each spacer is made of cushion material.

6. The thorn-proof insole as claimed in claim 1, wherein the four plates are designed with different thickness.

7. The thorn-proof insole as claimed in claim 1, wherein the four plates are designed with same thickness.

8. The thorn-proof insole as claimed in claim 1, wherein the plates are made of alloy, compound material of metal and nonmetal or compound material of nonmetal.

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