



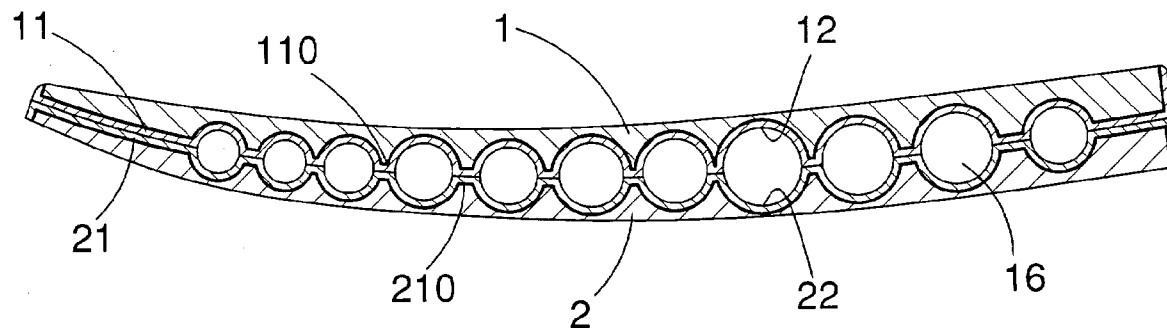
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(19) **United States**(12) **Patent Application Publication****Wang**(10) **Pub. No.: US 2004/0154189 A1**(43) **Pub. Date: Aug. 12, 2004**(54) **SHOE SOLE STRUCTURE**(57) **ABSTRACT**(76) Inventor: **Swei Mu Wang**, Taichung (TW)

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ELLICOTT CITY, MD 21043 (US)**(21) Appl. No.: **10/364,384**(22) Filed: **Feb. 12, 2003****Publication Classification**(51) **Int. Cl.⁷** **A43B 13/18**(52) **U.S. Cl.** **36/28; 36/29**

A shoe sole structure that not only provides a shock absorbing effect but also can protect the elastic portion of the shoe sole structure from aging and wear. The shoe sole structure contains a first protective container, a first elastic pad, a second protective container and a second protective container. The first protective container has a first side having a first containing space and a second side having plural first gutters thereon. The first elastic pad is united with the first side within the first containing space. The second protective container has a third side having a second containing space and a forth side having plural second gutters thereon. The second elastic pad is united with the third side within the second containing space. The second side is united with the forth side. Accordingly the first and second elastic pads are protected from exposing to sunlight and air directly and the first gutters combined with the second gutters form plural channels that greatly increase the elasticity of the shoe sole structure.



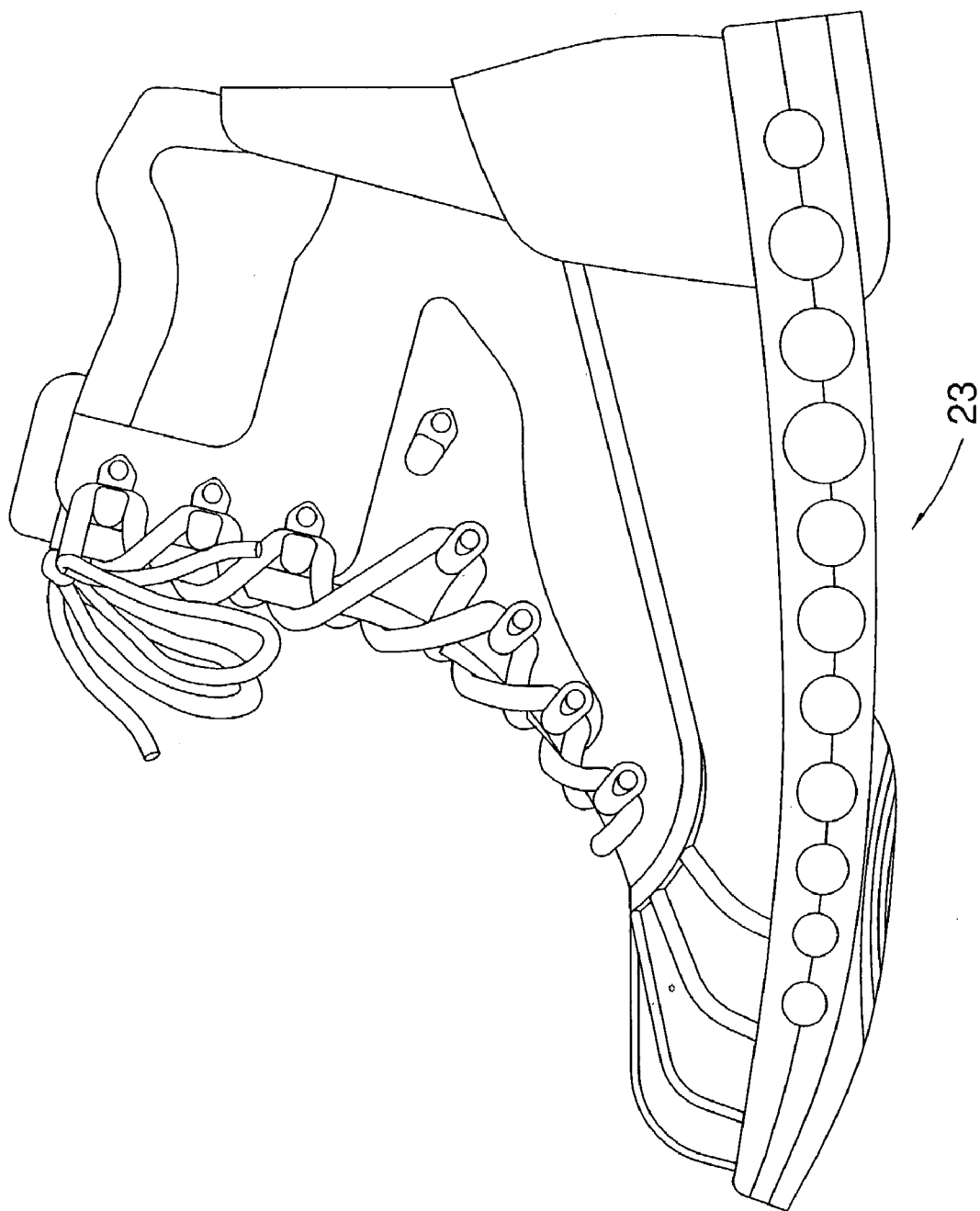


FIG. 1

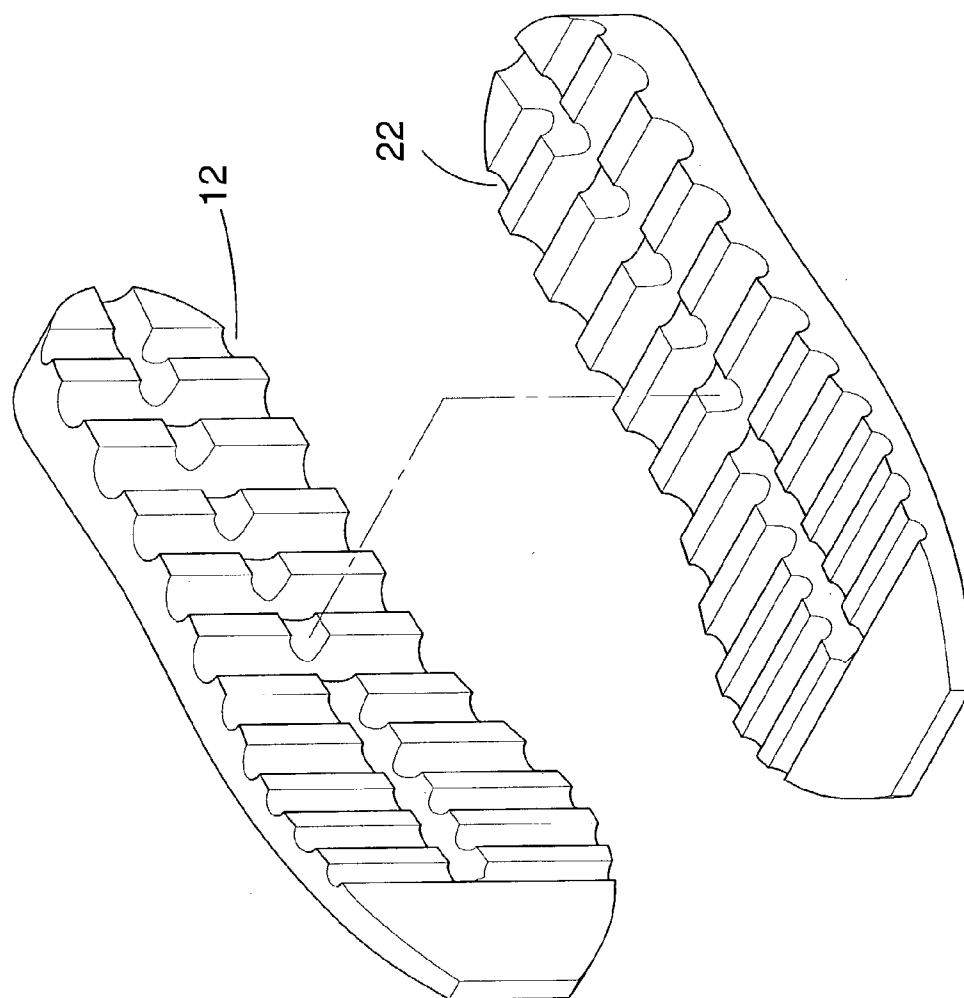


FIG. 2

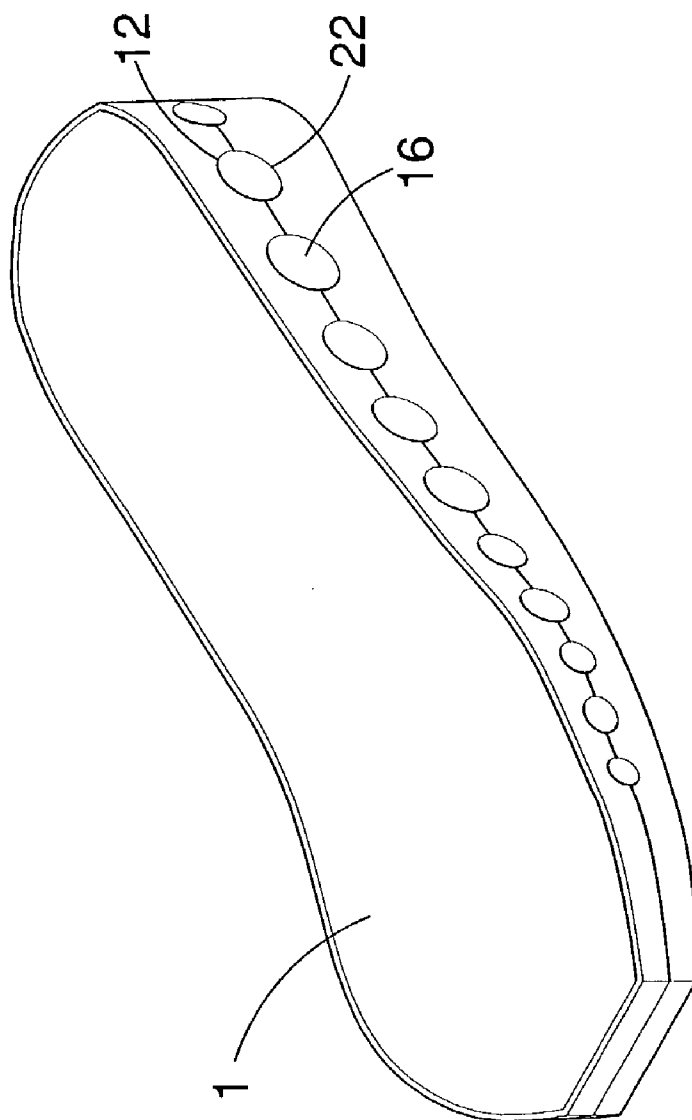


FIG. 3

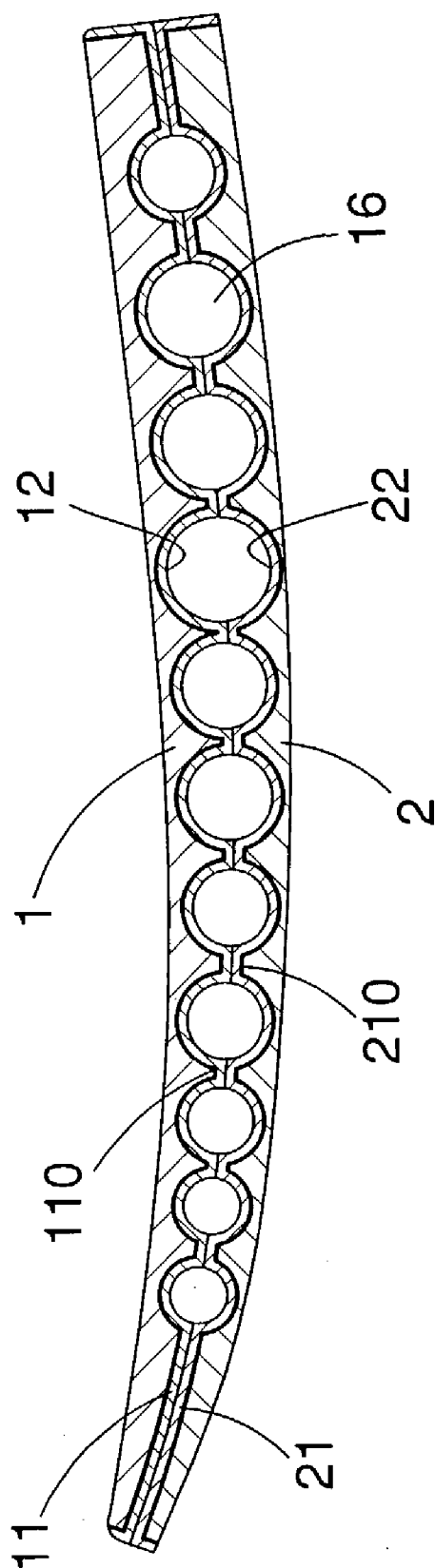


FIG. 4

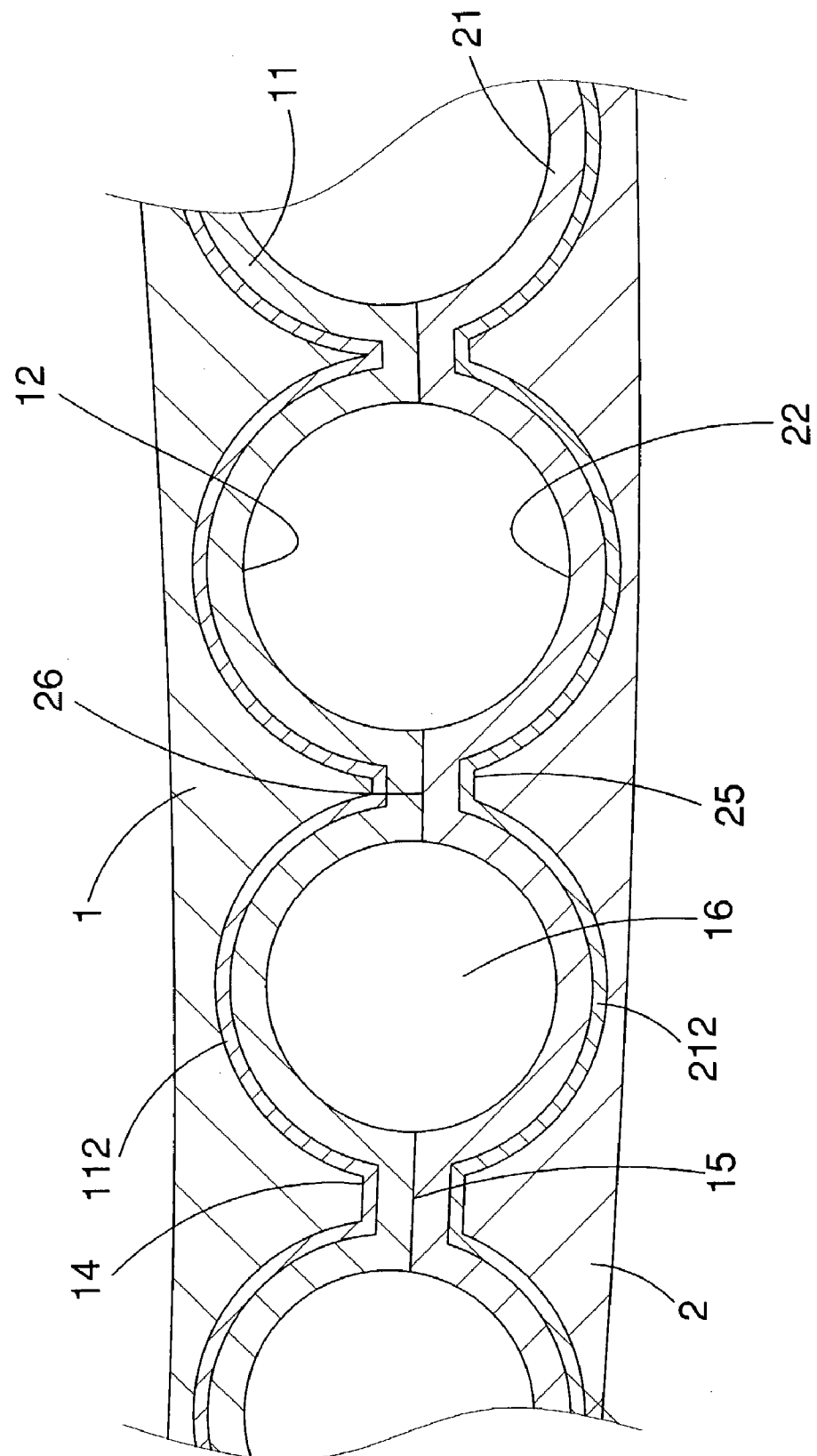


FIG. 5

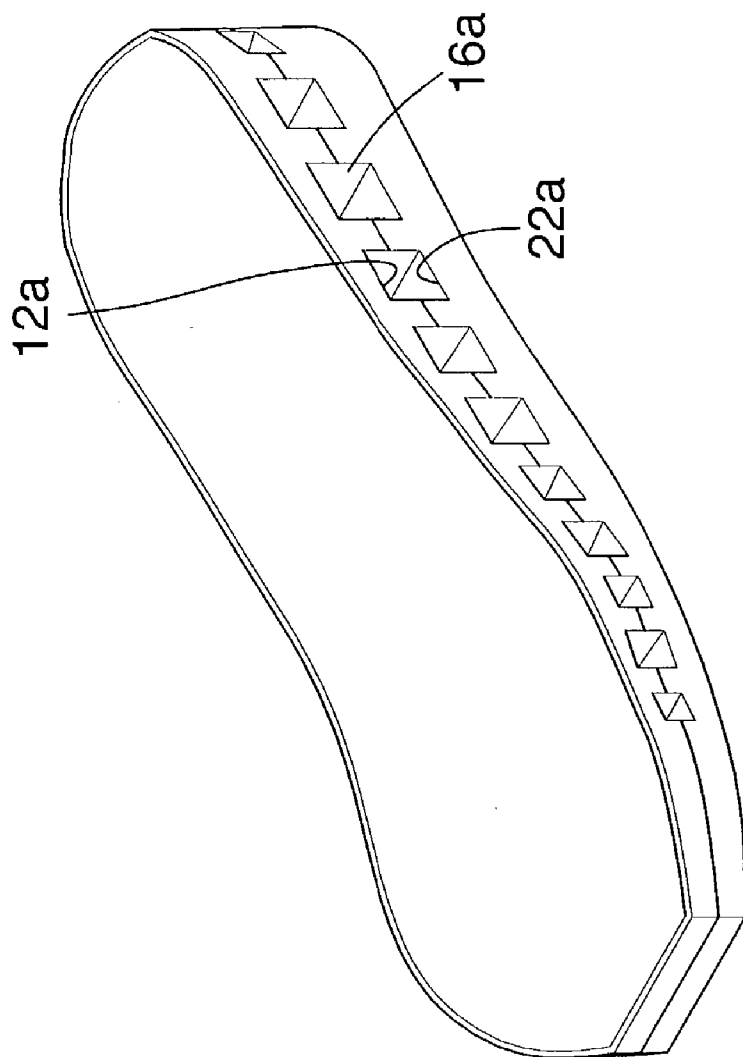


FIG. 6

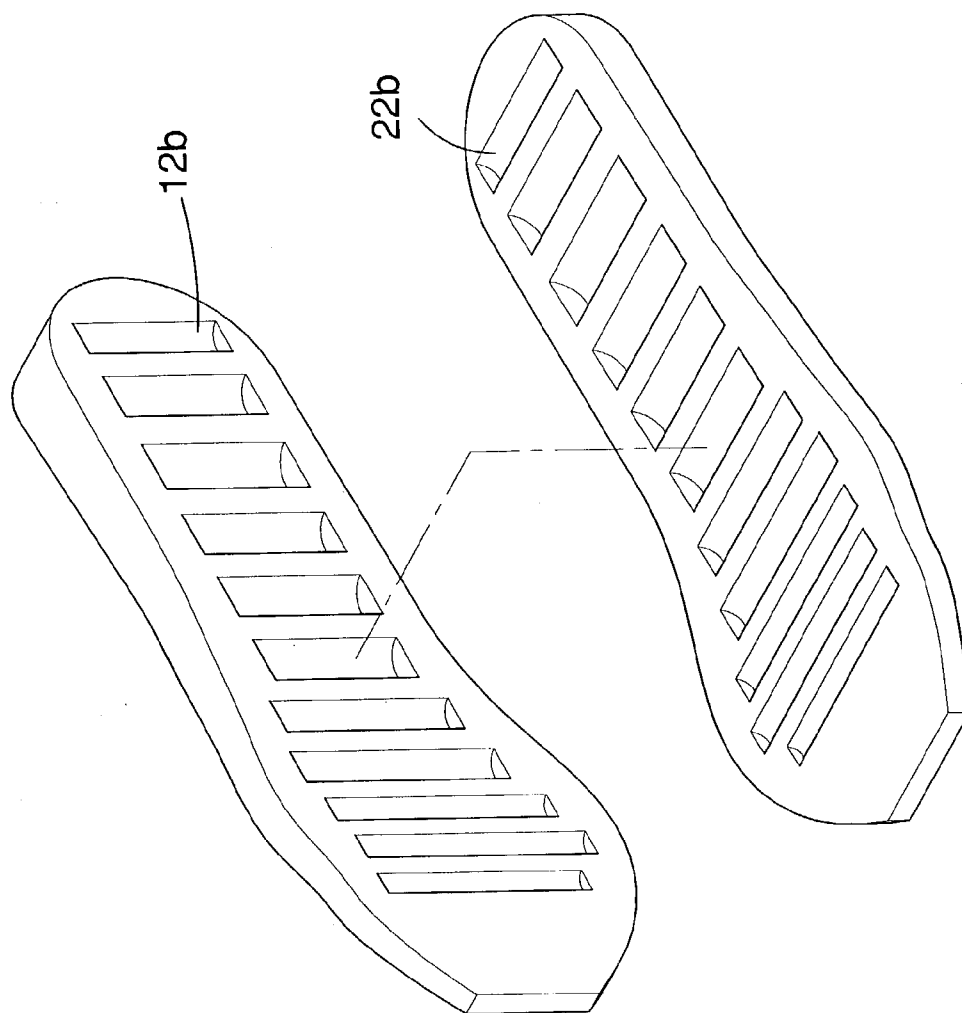


FIG. 7

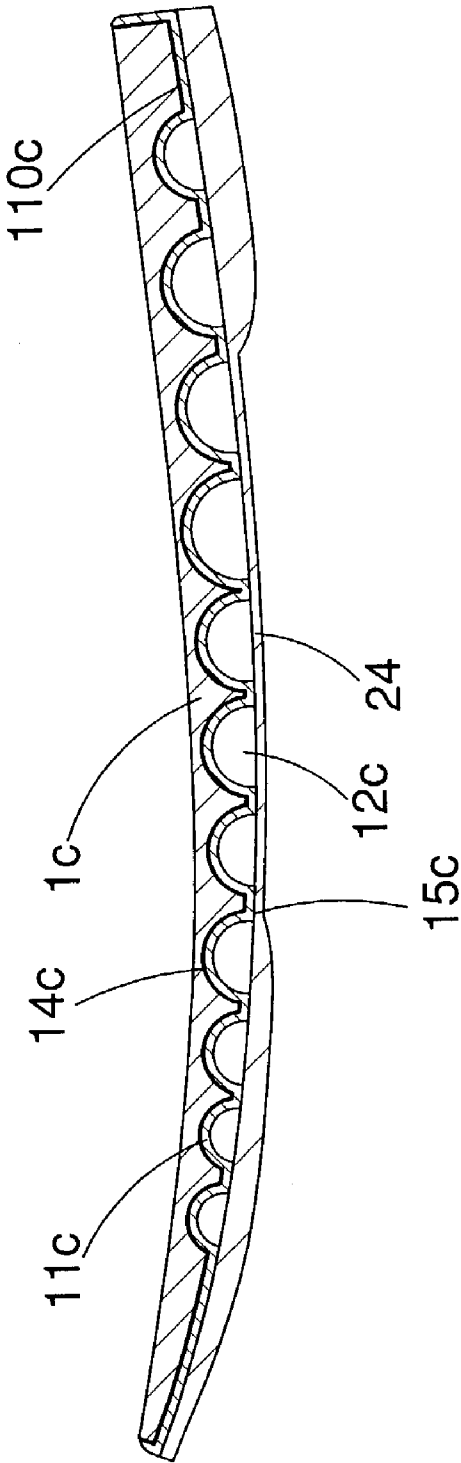


FIG. 8

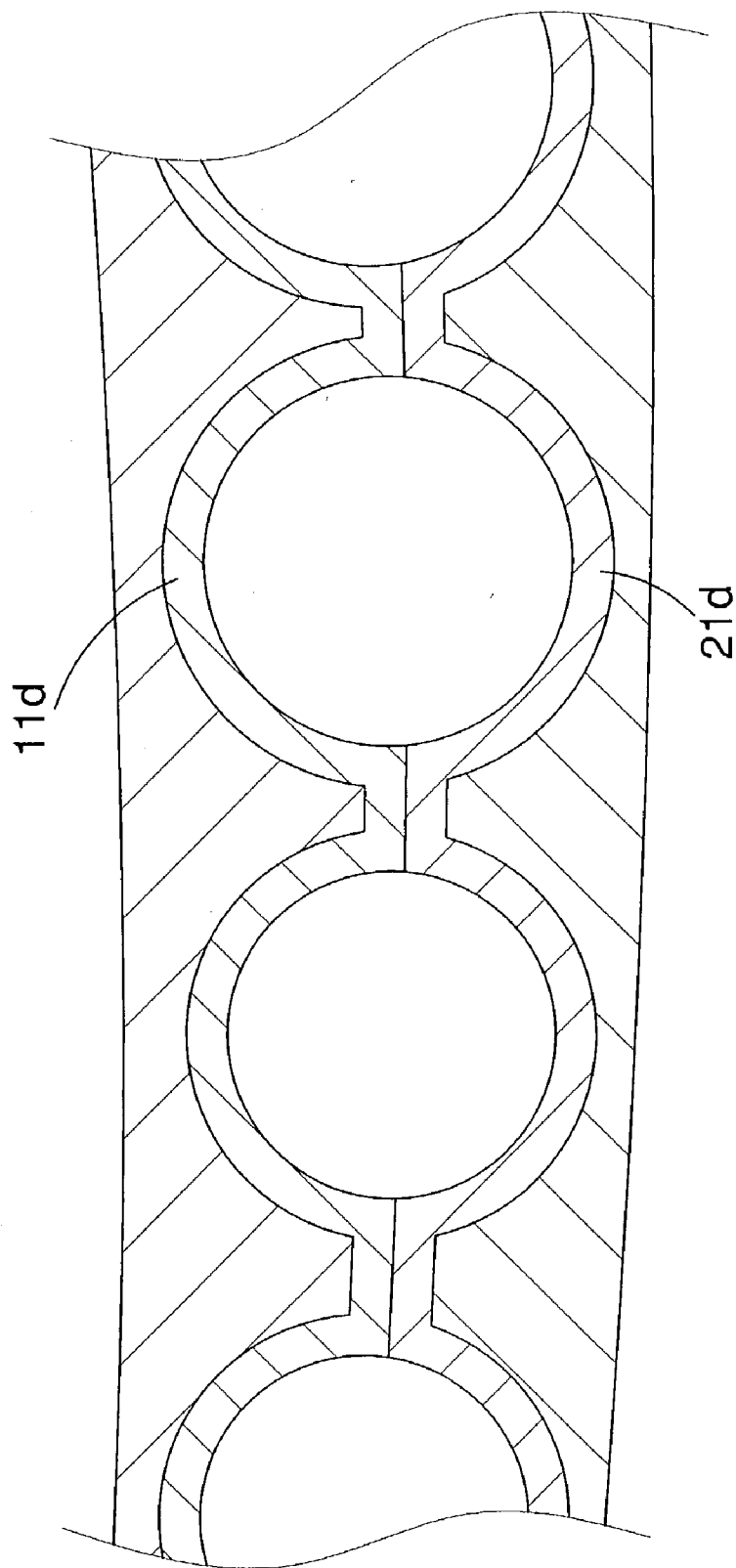


FIG. 9

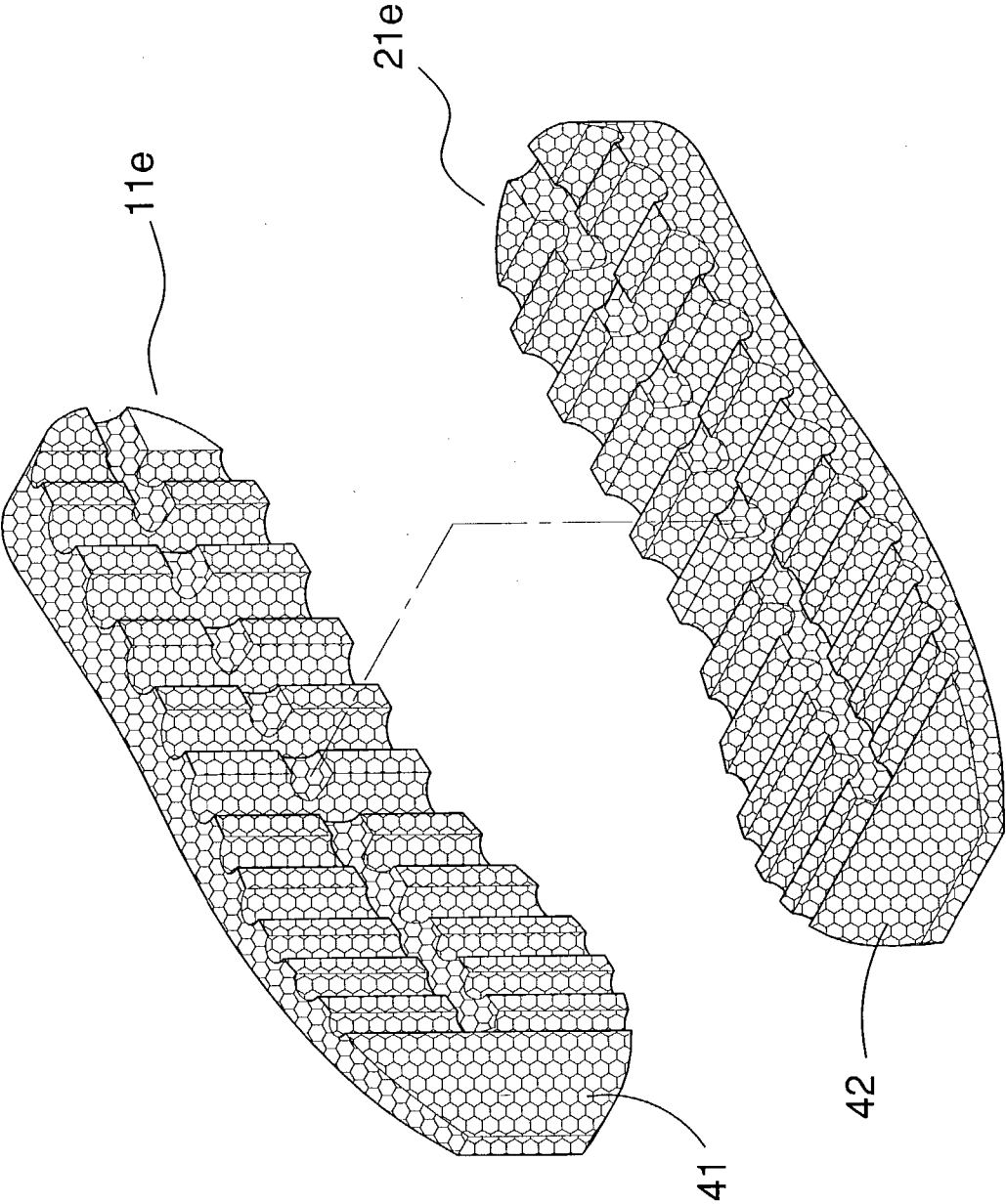


FIG. 10

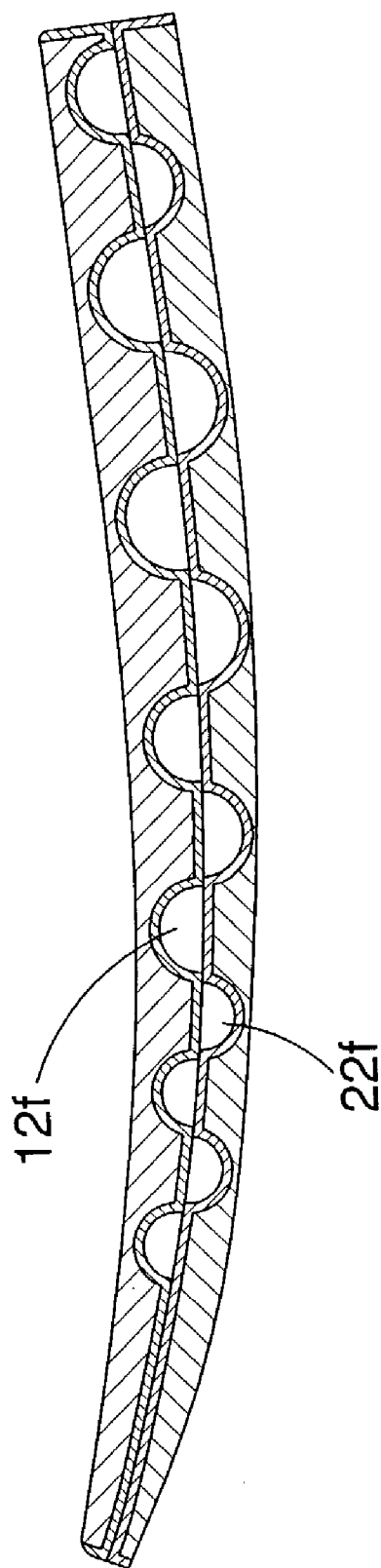


FIG. 11

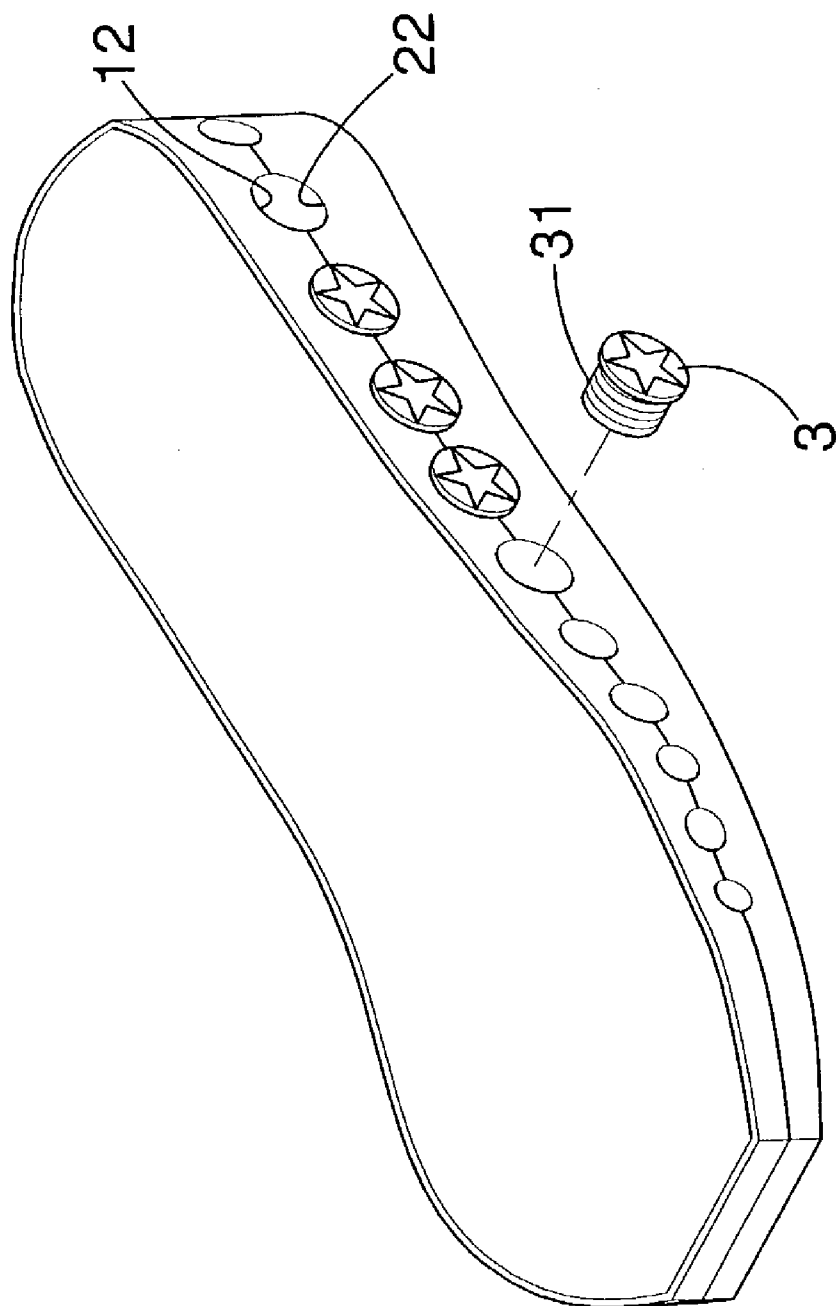


FIG. 12

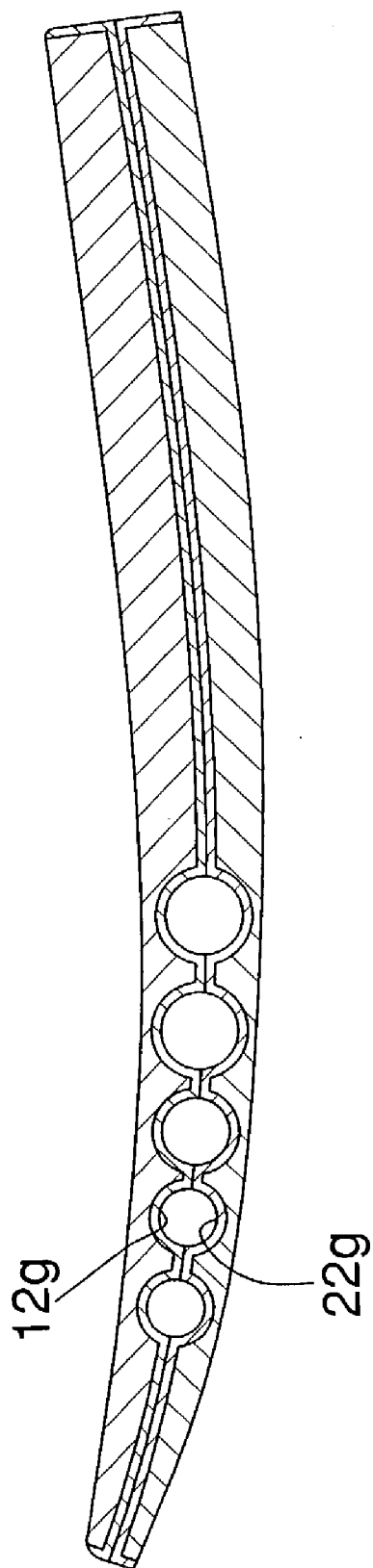


FIG. 13

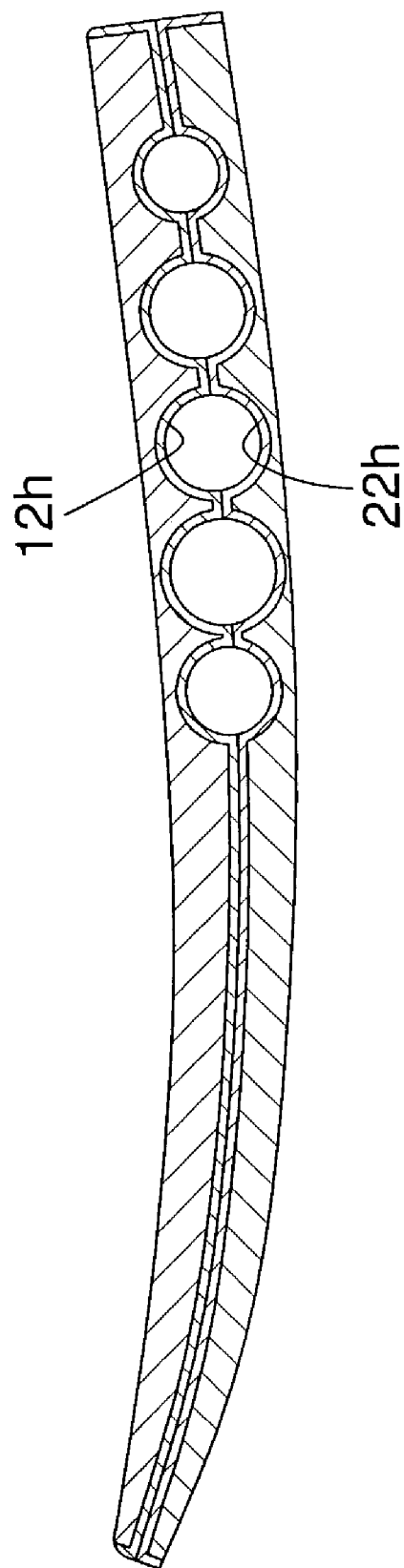


FIG. 14

SHOE SOLE STRUCTURE

TECHNICAL FIELD

[0001] This invention relates generally to a shoe sole structure for footwear. More particularly, the present invention relates to a shoe sole structure that not only provides a shock absorbing effect but also can protect the elastic portion of the shoe sole structure from aging and wear.

BACKGROUND OF THE INVENTION

[0002] Shoes, especially for jogging, running or other sport purposes, have two basic requirements. The principal task of the shoe is to help the act of running, so that the runner moves forwardly as sparingly as possible. The other task of the shoe is to protect the feet for running exertion, so that conditions for the runner's optimum performance may also be preserved or maintained through the latter part of a running race. In addition, in a consumer's point of view, longer life of a shoe sole structure is preferred. To achieve the aforementioned functions, many different shoes have been developed

[0003] Resilience of the sole can be obtained in many different ways. For example, a traditional shoe sole structure is composed of a foaming material for providing elasticity and a rubber layer combined with the foaming material for protecting the foaming material. However the rubber layer can only protect the bottom portion of the foaming material. The surroundings of the foaming are not protected. Therefore the foaming material exposes to sunlight and moisture directly. That causes the foaming material aged and worn quickly. Besides, for the purpose of running or other sports with heavy duties, the elasticity provided by the foaming material of the traditional shoe sole structure is not enough.

[0004] Another design of traditional shoe sole structure is an air cushion structure. However, the cost of air cushion shoe sole is high and the procedure of manufacturing is complex. In addition, sometimes unnecessary deformations take place in the shoe sole of air cushion structure. Accordingly a shoe sole structure with sufficient and proper elasticity as well as long life and comparatively low cost of manufacture is needed.

SUMMARY OF INVENTION

[0005] It is therefore an objective of the present invention to provide a shoe sole structure with sufficient and proper elasticity.

[0006] A further important object of the present invention is to provide a shoe sole structure that can prevent the elastic portion of the sole from aging and wear.

[0007] The present invention, briefly summarized, in one embodiment discloses a shoe sole structure. The shoe sole structure contains a first protective container, a first elastic pad, a second protective container and a second protective container. The first protective container has a first side having a first containing space and a second side having plural first gutters thereon. The first elastic pad is united with the first side within the first containing space. The second protective container has a third side having a second containing space and a forth side having plural second gutters thereon. The second elastic pad is united with the third side within the second containing space. The second side is

united with the forth side. Another embodiment of the present invention discloses a shoe sole structure containing a protective container, an elastic pad and an outsole. The protective container has a first side having a containing space and a second side having plural gutters thereon. The elastic pad is united with the first side within the containing space. The outsole is united with the second side of the protective container.

BRIEF DESCRIPTION OF DRAWINGS

[0008] The invention will be more clearly understood after refer to the following detailed description read in conjunction with the drawings wherein:

[0009] FIG. 1 is a perspective view of an application of a first embodiment;

[0010] FIG. 2 is an exploded perspective view of the embodiment;

[0011] FIG. 3 is an perspective view of the assembled embodiment

[0012] FIG. 4 is a cross sectional view of the embodiment;

[0013] FIG. 5 is an enlarged cross sectional view of the embodiment;

[0014] FIG. 6 is a perspective view of a second embodiment;

[0015] FIG. 7 an exploded view of a third embodiment;

[0016] FIG. 8 is a cross sectional view of a forth embodiment;

[0017] FIG. 9 is an enlarged cross sectional view of a fifth embodiment;

[0018] FIG. 10 is an exploded view of a sixth embodiment;

[0019] FIG. 11 is a cross sectional view of a seventh embodiment;

[0020] FIG. 12 is an exploded view showing plural plugs plugged into the open ends of the gutters of the first embodiment;

[0021] FIG. 13 is a cross sectional view of a eighth embodiment; and

[0022] FIG. 14 is a cross sectional view of a ninth embodiment.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0023] With reference to FIG. 1 to FIG. 5, The shoe sole structure mainly contains a first protective container 11, a first elastic pad 1, a second protective container 21 and a second elastic pad 2. The first protective container 11 has a first side 14 having a first containing space 110 and a second side 15 having plural first gutters 12 thereon. A pattern layer 112 is united with the first side 14 of the first protective container 11. The first and second elastic pads are made of a foaming material. The first and second protective containers are made of a transparent, waterproof and wear resisting material. The first elastic pad 1 is united with the pattern layer 112 within the first containing space 110. Accordingly, one side and the surroundings of the first elastic pad 1 are

wrapped by the first protective container **11**. As the application shown in **FIG. 1**, another side of the elastic pad **1** is united with an insole of the shoe. Therefore the elastic pad **1** is protected from exposing to sunlight and air directly.

[0024] The second protective container **21** contains a third side **25** having a second containing space **210** and a forth side **26** having plural second gutters **22** thereon. A pattern layer **212** is united with the third side of the second protective container **21**. The second elastic pad **2** is united with the pattern layer **212** within the second containing space **210**. Accordingly, one side and the surroundings of the second elastic pad **2** are wrapped by the second protective container **21**. Similarly, as the application shown in **FIG. 1**, another side of the elastic pad **2** is united with an outsole **23** of the shoe. Therefore the elastic pad **2** is protected from exposing to sunlight and air directly.

[0025] The pattern layers **112**, **212** have patterns thereon. The pattern layer **112**, **212** can be any color. The second side **15** is united with the forth side **26**. The plural first gutters **12** and the plural second gutters **22** are united correspondingly. The shapes of the plural first gutters **12** and the plural second gutters **22** are semicylindrical. Therefore the plural first gutters **12** and the plural second gutters **22** form plural circular channels **16**. The formation of the channels can greatly increase the elasticity of the shoe sole structure.

[0026] With reference to **FIG. 6**, in the embodiment, the shapes of the channels **16a** made by combination of the first gutter **12a** and second gutter **22a** are square. The shapes of the channels can be designed to any shape desired.

[0027] With reference to **FIG. 7**, in the embodiment, the gutters **12b**, **22b** are close ended. One advantage of the embodiment is that stone or sand will not enter into the channels.

[0028] With reference to **FIG. 8**, the embodiment contains a protective container **11c**, an elastic pad **1c** and an outsole **24**. The protective container **11c** has a first side **14c** having a containing space **110c** and a second side **15c** having plural gutters **12c** thereon. The elastic pad **1c** is united with the first side **14c** within the containing space **110c**. The outsole **24** is united with the second side **15c** of the protective container **11c**.

[0029] With reference to **FIG. 9**, the embodiment contains all the elements of the first embodiment described above except there is no pattern layer. The first protective container **11d** and the second protective container **21d** directly united with the first elastic pad and the second elastic pad respectively.

[0030] With reference to **FIG. 10**, the embodiment contains all the elements of the first embodiment described above except there is no pattern layer. The first protective container **11e** and the second protective container **21e** directly united with the first elastic pad and the second elastic pad respectively. In addition, the second side **41**, **42** of the protective containers have patterns thereon.

[0031] **FIG. 11** shows an embodiment that the first gutters **12f** and the second gutters **22f** are interlaced.

[0032] With reference to **FIG. 12**, the embodiment shows plural plugs **3** are plugged into the channels formed by the combination of the first gutters **12** and the second gutters **22**

for preventing sands or rocks fall into the channels. Each of the plural plugs **3** has a connecting portion **31**.

[0033] With reference to **FIG. 13**, the channels formed by the combination of the first gutters **12g** and second gutters **22g** in this embodiment are placed only at the front portion of the shoe sole structure.

[0034] With reference to **FIG. 13**, the channels formed by the combination of the first gutters **12h** and second gutters **22h** in this embodiment are placed only at the rear portion of the shoe sole structure.

[0035] One of the method of making the shoe sole structure contains: placing protective containers and pattern layers in a mold; heating them to the degree of deformable; vacuating one side of the protective container to form containing space at the opposite side and plural gutters at the same side of vacuating; placing foaming material in the containing space; heating and press the foaming material inside the containing space to fixed shape; and finally combing two sets of the products made as described above by high frequency wave.

[0036] Numerous characteristics and advantages of the invention have been set forth in the foregoing description, together with details of the structure and function of the invention, and the novel features thereof are pointed out in appended claims. The disclosure, however, is illustrated only, and changes may be made in detail, especially, in matters of shape, size and arrangement of parts, materials and the combination thereof within the principle of the invention, to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

We claim:

1. A shoe sole structure comprising:

a first protective container having:

a first side having a first containing space; and

a second side having plural first gutters thereon;

a first elastic pad united with said first side within said first containing space;

a second protective container having:

a third side having a second containing space; and

a forth side having plural second gutters thereon; and

a second elastic pad united with said third side within said second containing space;

wherein said second side is united with said forth side.

2. The sole structure of claim 1, wherein said first protective container and said second protective container further comprising a pattern layer respectively united with said first side and said third side correspondingly.

3. The shoe sole structure of claim 1, wherein said first protective container and said second protective container are transparent and waterproof.

4. The shoe sole structure of claim 1, wherein said plural first gutters combined with said plural second gutters correspondingly form plural channels.

5. The shoe sole structure of claim 1, wherein said plural first gutters interlace with said plural second gutters.

6. The shoe sole structure of claim 1, wherein said plural first gutters and said plural second gutters are open ended.

7. The shoe sole structure of claim 1, wherein said plural first gutters and said plural second gutters are close ended.

8. The shoe sole structure of claim 1, wherein the shapes of said plural first gutters and said plural second gutters are semicylindrical.

9. The shoe structure of claim 1, wherein said first elastic pad and said second elastic pad are made of a foaming material.

10. The shoe sole structure of claim 6 further comprising: plural plugs for being plugged into said open ends.

11. A shoe sole structure comprising:

a protective container having:

a first side having a containing space; and

a second side having plural gutters thereon;

an elastic pad united with said first side within said containing space; and

an outsole united with said second side of said protective container.

12. The sole structure of claim 11, wherein said protective container further comprising a pattern layer united with said first side

13. The shoe sole structure of claim 11, wherein said first protective container and said second protective container are transparent and waterproof.

14. The shoe sole structure of claim 11, wherein said plural gutters are open ended.

15. The shoe sole structure of claim 11, wherein said plural gutters are close ended.

16. The shoe sole structure of claim 11, wherein the shapes of said plural gutters are semicylindrical.

17. The shoe structure of claim 11, wherein said first elastic pad and said second elastic pad are made of a foaming material.

18. The shoe sole structure of claim 14 further comprising: plural plugs for being plugged into said open ends.

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