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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) Shoe sole with air ventilation device

(57) A show sole (1) includes a bellows portion (11) located at the heel section of the sole and a compressible space (12) is defined in the bellows portion. A spring unit (13) is located in the compressible space. At least one escape hole (121) is defined through a wall of the bellows portion. An insole (3) is mounted to the sole and seals the compressible space. Multiple pipes (122) extend from the compressible space and each has two open ends. One of the two open ends of each pipe communicates with the compressible space. When the compressible space is compressed, the air in the compressible space flows through the pipes and the escape hole. When the force is released from the compressible space, the air outside the shoe is sucked into the compressible space.

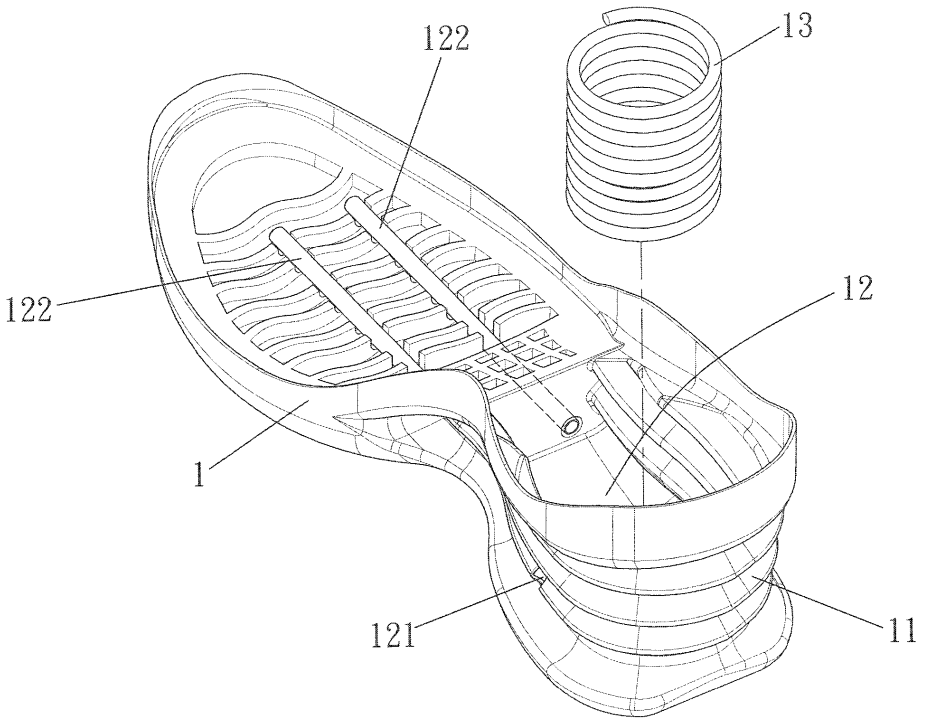

FIG. 1

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Description

[0001] The present invention relates to a shoe having an air ventilation device in the sole so as to remove heat and moisture from the wearer's foot.

[0002] A conventional shoe is designed for protection the foot of the wearer when walking or running and the conventional shoes include a vamp connected to the outsole to form an enclosed space in which the wearer's foot is received. After a period of time of use, the air in the space cannot escape from the shoe and the wearer's sweat is mixed with the hot air to cause bad smell. The hot air further increases reproduction of germs such as fungus which may cause athlete feet to the wearers. Besides, most of the conventional shoes do not have proper shock absorbing device and the impact is directly transferred the wear's ankles. The impact affects not only the muscles and ankles, but also the spine and even the brain. Some shoes in the market claim that they have ventilation system for providing circulation of the air in the shoes, most of them can only provide weak air flow in the shoes and the weak air flow cannot achieve the desired purposes.

[0003] The present invention intends to provide a sole of a shoe and an air ventilation device is located in the sole, the air ventilation device includes a compressible space at the heel portion and pipes extend to the front portion of the shoe so as to bring air to front of the shoe, and at least one escape hole is defined in the heel portion to allow the air to escape from the shoe when the compressible space is compressed.

[0004] The present invention relates to a shoe sole which comprises a sidewall extending from upward from an outer periphery thereof and a bellows portion is located at heel section of the sole. A compressible space is defined in the bellows portion and a spring unit is located in the compressible space. At least one escape hole is defined through a wall of the bellows portion. Multiple pipes extend from the compressible space and each include two open ends, one of the two open ends of each pipe communicates with the compressible space.

[0005] The primary object of the present invention is to provide a shoe sole that can effectively bring moisture out from the interior of the shoe.

[0006] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

Fig. 1 is an exploded view to show the shoe sole and the air ventilation device of the present invention;

Fig. 2 is a perspective view to show the shoe sole with the air ventilation device installed therein;

Fig. 3 is a cross sectional view to show that the air ventilation device of the present invention is compressed;

Fig. 4 shows that air escapes from the escape hole and flows through the pipes in the shoe sole of the present invention;

Fig. 5 is a cross sectional view to show that the air ventilation device of the present invention bounces back;

Fig. 6 shows that air is sucked into the compressible space via the escape hole and the pipes in the shoe sole of the present invention;

Fig. 7 is an exploded view to show the second embodiment of the shoe sole and the air ventilation device of the present invention, and

Fig. 8 is a perspective view to show the shoe sole with the air ventilation device as shown in Fig. 7 installed therein.

[0007] Referring to Figs. 1 and 2, the shoe sole 1 of the present invention comprises a front section, a middle section and a heel section. A sidewall extends from upward from an outer periphery thereof and includes a bellows portion 11 which is located at heel section of the sole 1. A compressible space 12 is defined in the bellows portion 11 and a spring unit 13 is located in the compressible space 12. At least one escape hole 121 is defined through a wall of the bellows portion 11 and communicates with the compressible space 12.

[0008] Two pipes 122 extend from the compressible space 12 and each have two open ends, and one of the two open ends of each pipe 122 communicates with the compressible space 12. In this embodiment, the sole 1 includes transverse and parallel plates and two passages are defined perpendicularly through these plates. The pipes 122 are located within the passages and arranged axially in the sole 1. The pipes 122 are ended at a front section of the sole 1.

[0009] As shown in Figs. 3 and 4, an insole 3 is mounted on the sole 1 and seals the open top of the compressible space 12, and a vamp 4 is connected to the sole 1 to form a shoe. When walking or running, the wearer applies a force to compress the spring unit 13 and compresses the compressible space 12, air in the compressible space 12 escapes from the at least one escape hole 121 and flows through the two pipes 122. The air flowing out from the pipes 122 keeps the wearer's foot dry.

[0010] As shown in Figs. 5 and 6, when the force is disappeared, the spring unit 13 bounces the bellows portion 11 to its original shape and air outside the shoe is sucked into the compressible space 12 via the at least one escape hole 121 and the air in the shoe is sucked via the pipes 122. The moisture is then sucked into the compressible space 12 and will escape from the at least one escape hole 121 when the compressible space 12 is compressed again.

[0011] Figs. 7 and 8 show the second embodiment of the present invention wherein the sole 1 comprises a front section, a middle section and a heel section. The middle section and the heel section include a top portion 14 and a lower portion 15 extending from the middle section and a wedge-shaped space 120 is defined between

the top and lower portion 14, 15. The wedge-shaped space 120 is located at the heel section of the sole 1. Two pipes 122 located axially in the front section and each have two open ends.

[0012] Two first holes are defined in the conjunction portion of the top and lower portions 14, 15 and communicate with the pipes 122. A wedge-shaped compressible part 2 is securely engaged with the wedge-shaped space 120 and includes a hollow interior and bellows-shaped outside. At least one escape hole 21 is defined through a wall of the compressible part 2 and communicates with the hollow interior. A spring unit 22 is located in the compressible part 2. Two second holes 23 are defined through a front end of the compressible part 2 and in communication between the two first holes and the hollow interior. By compressing and bouncing the wedge-shaped compressible part 2, the air can be ventilated throughout the shoe.

[0013] The bellows portion 11 assists the deformation of the compressible space to be compressed to effectively ventilate the air throughout the shoe. The air in the shoe can be brought out from the escape hole and the fresh air outside the shoe is sucked into the shoe to achieve desired ventilation purpose. The spring unit absorbs the impact from the ground and provides comfortable wearing. The compressing and bouncing of the spring unit stimulate the wearer's foot to benefit blood circulation.

[0014] 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.

Claims

1. A sole for a shoe, comprising:

a front section, a middle section and a heel section, a sidewall extending from upward from an outer periphery thereof and including a bellows portion which is located at heel section of the sole, a compressible space defined in the bellows portion and a spring unit located in the compressible space, at least one escape hole defined through a wall of the bellows portion, and multiple pipes extending from the compressible space and each including two open ends, one of the two open ends of each pipe communicating with the compressible space.

2. The sole as claimed in claim 1, wherein the pipes are located axially in the sole and ended at a front section of the sole.

3. A sole 1 for a shoe, comprising:

a front section, a middle section and a heel section, the middle section and the heel section including a top portion and a lower portion extending from the middle section and a wedge-shaped space defined between the top and lower portion, the wedge-shaped space located at the heel section of the sole, multiple pipes located in the front section and each having two open ends, multiple first holes defined in a conjunction portion of the top and lower portions and communicating with the pipes, and

a compressible part securely engaged with the wedge-shaped space and including a hollow interior, at least one escape hole defined through a wall of the compressible part, a spring unit located in the compressible part, multiple second holes defined through a front end of the compressible part and being communication between the first holes and the hollow interior.

4. The sole as claimed in claim 3, wherein the pipes are located axially in the sole and ended at a front section of the sole.

Amended claims in accordance with Rule 137(2) EPC.

1. A sole 1 (1) for a shoe, comprising:

a front section, a middle section and a heel section, the middle section and the heel section including a top portion (14) and a lower portion (15) extending from the middle section, and a wedge-shaped space (120) defined between the top and lower portions (14, 15), the wedge-shaped space (120) located at the heel section of the sole, multiple pipes (122) located in the front section and each having two open ends, multiple first holes defined in a conjunction portion of the top and lower portions (14, 15) and communicating with the pipes (120), and

a compressible part (2) securely engaged with the wedge-shaped space (120) and located between the top and lower portions (14, 15), the compressible part (2) including a hollow interior, at least one escape hole (21) defined through a wall of the compressible part (2), a spring unit (22) located in the compressible part (2), multiple second holes (23) defined through a front end of the compressible part (2) and being in communication between the first holes and the hollow interior.

2. The sole as claimed in claim 3, wherein the pipes (122) are located axially in the sole and ended at a front section of the sole (1).

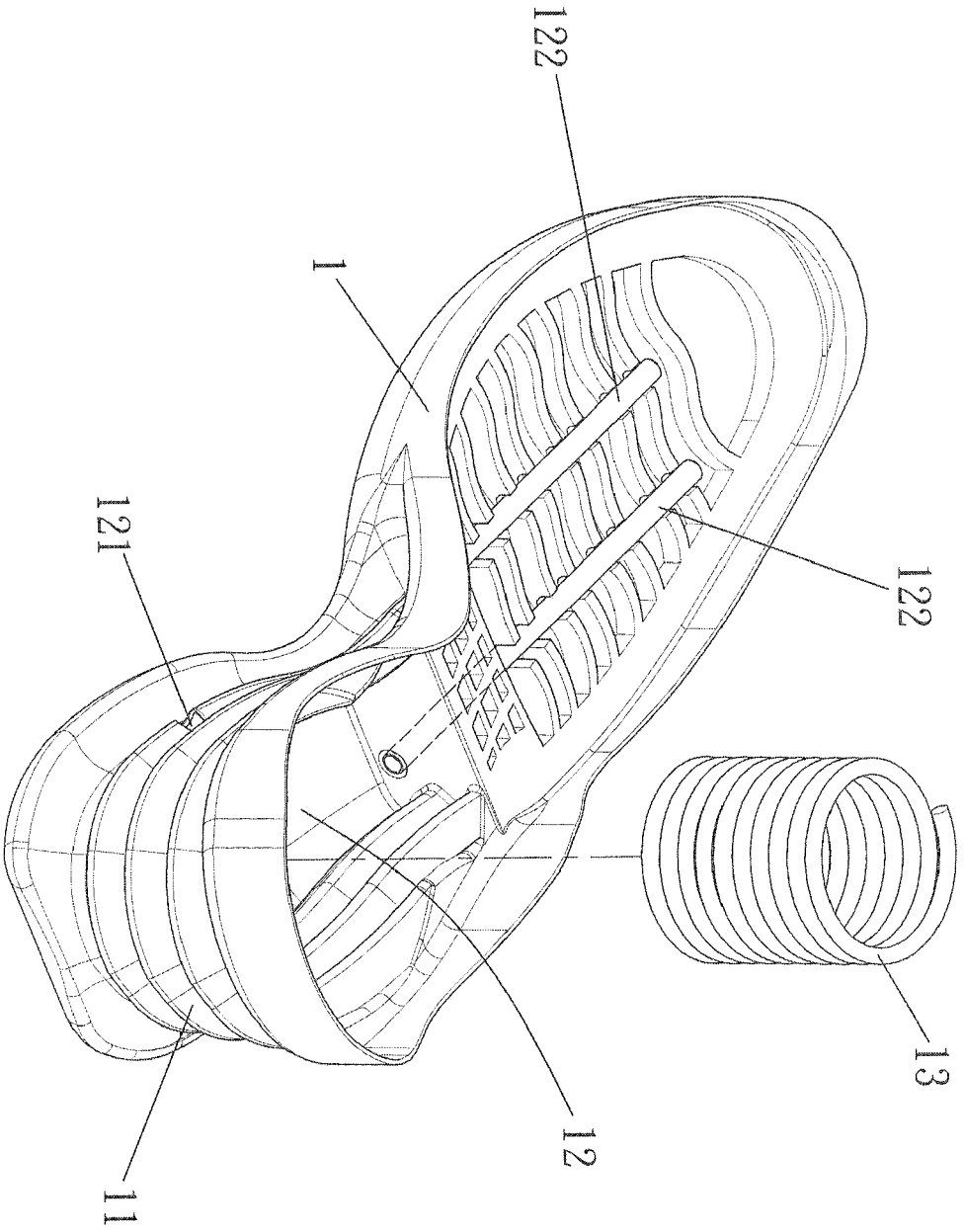
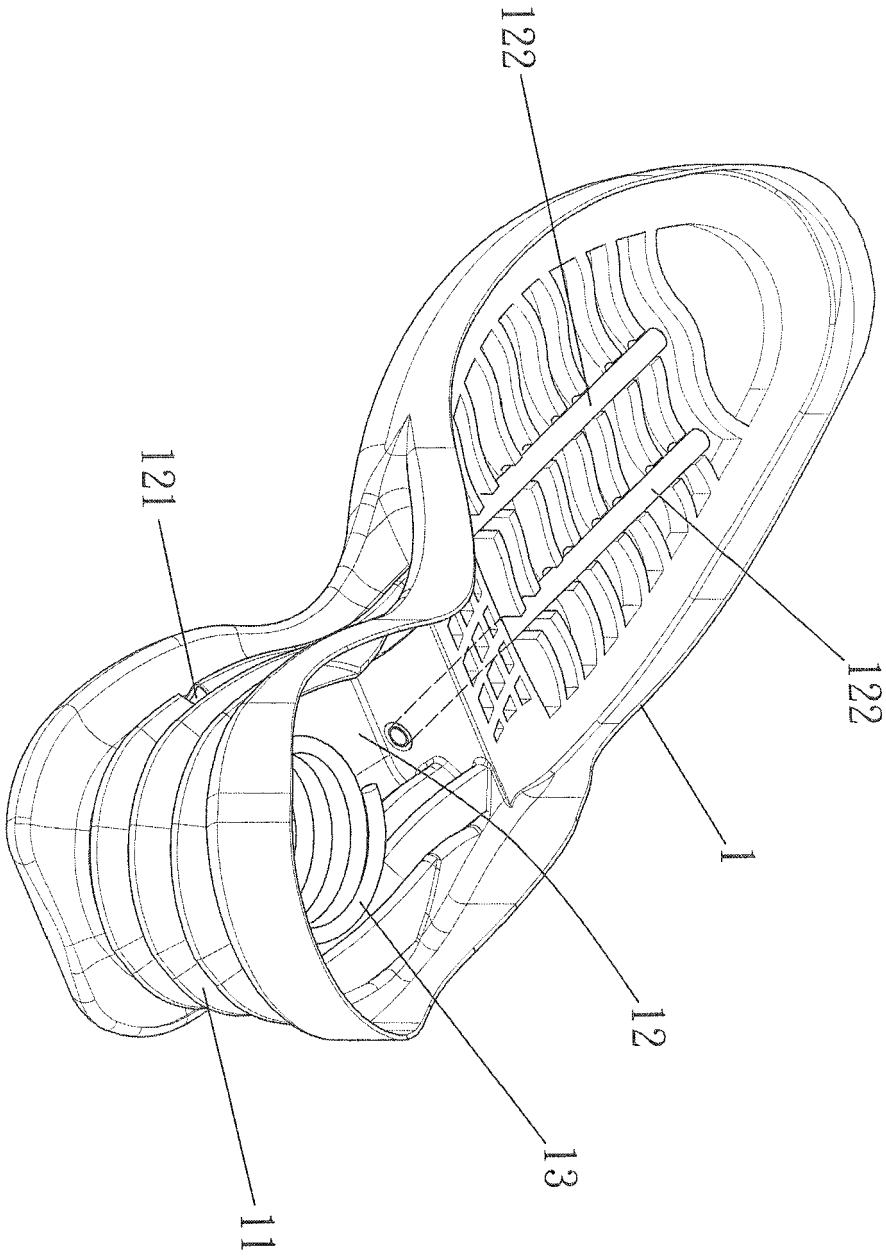


FIG. 1

FIG. 2



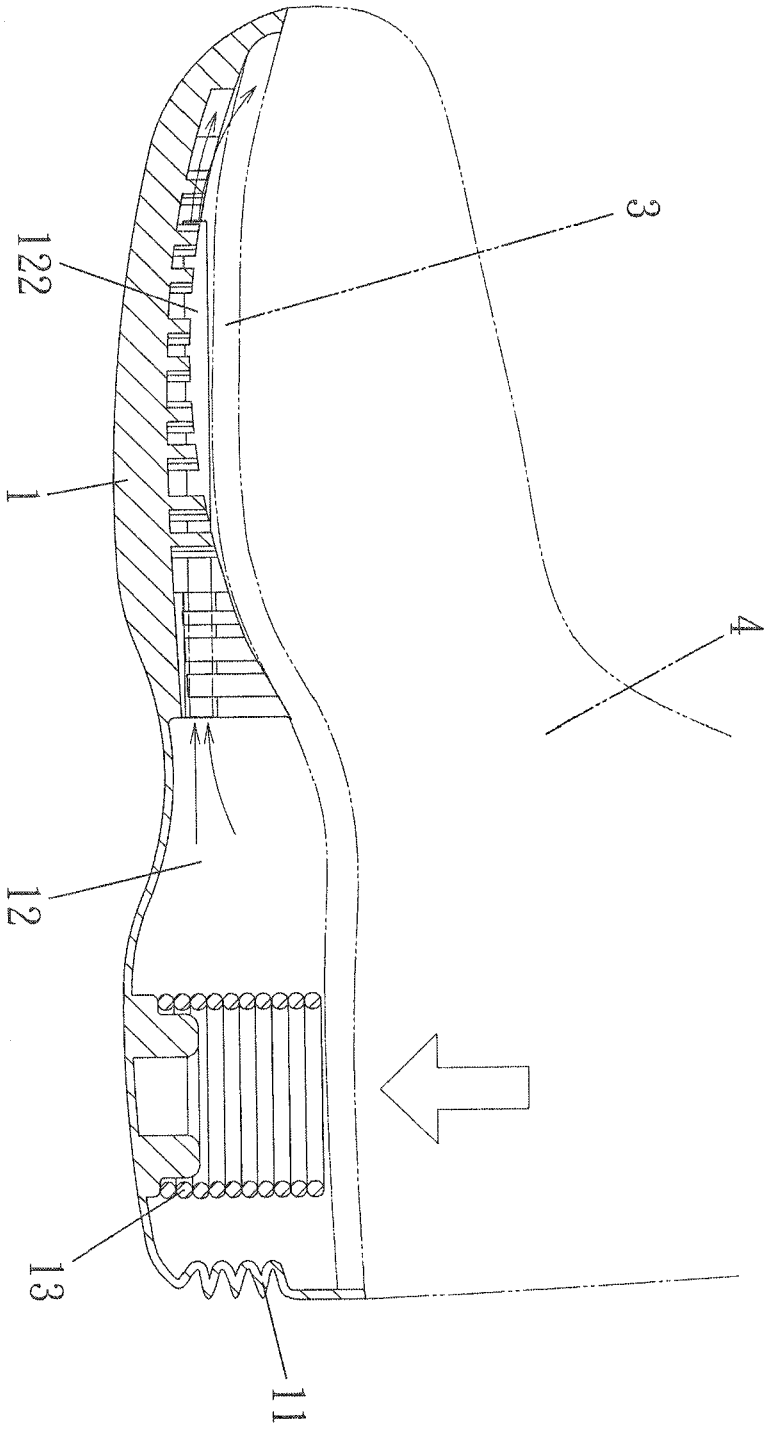
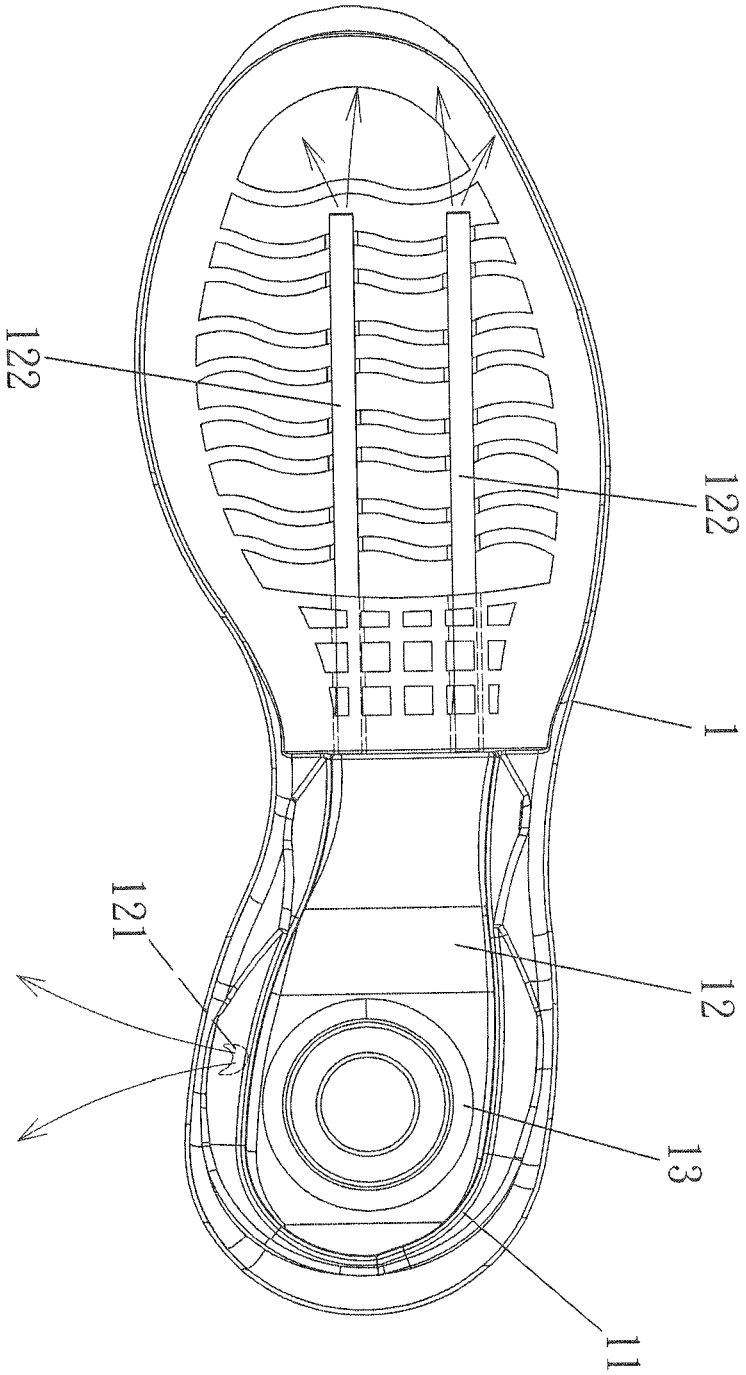


FIG. 3

FIG. 4



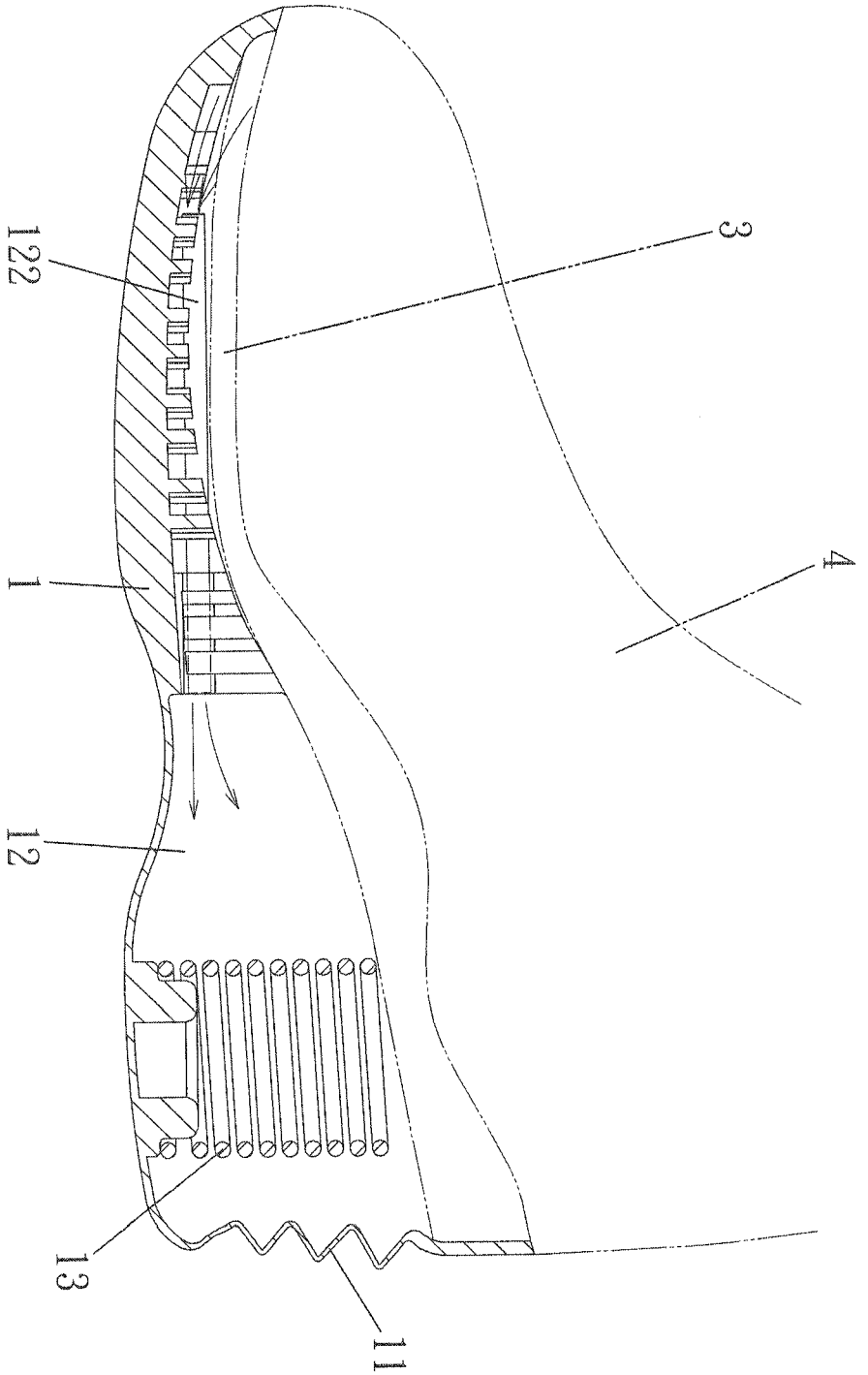
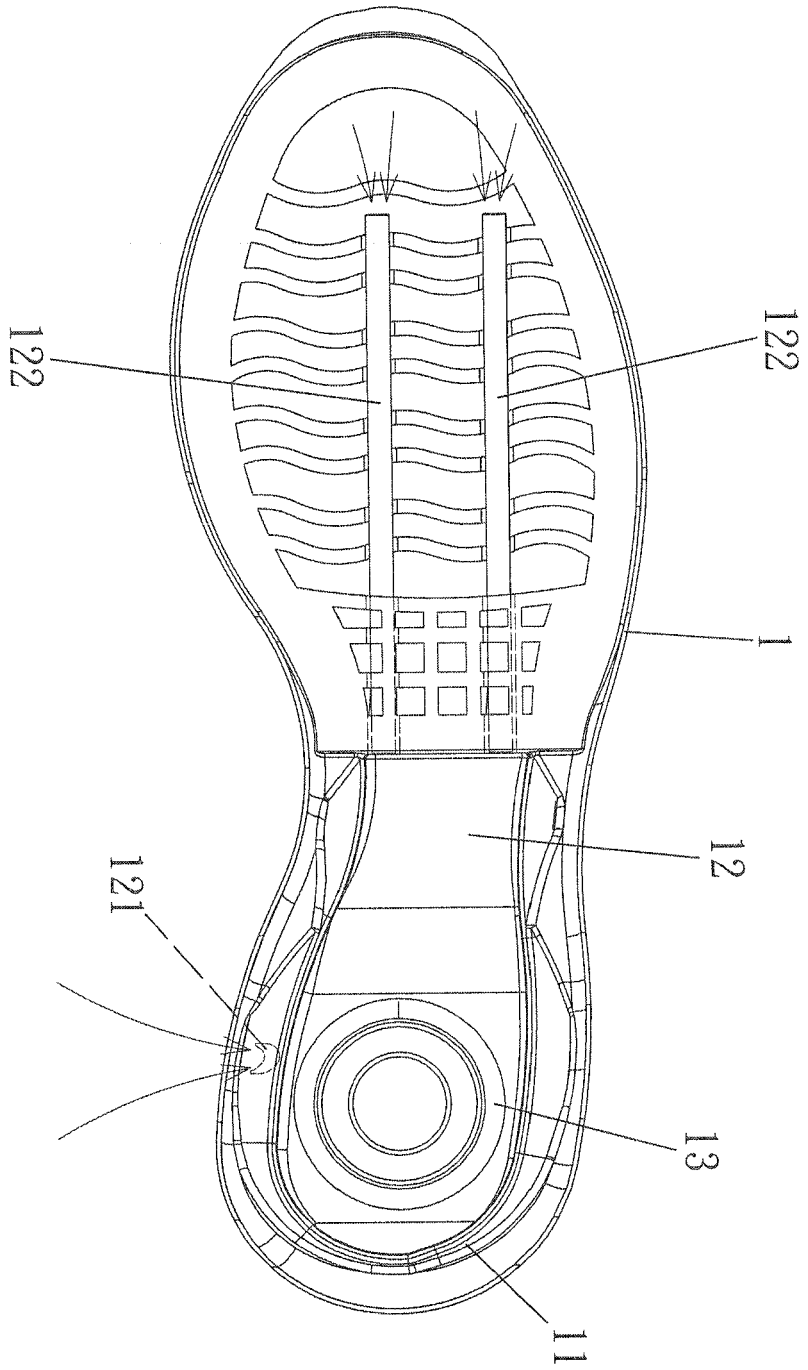


FIG. 5

FIG. 6



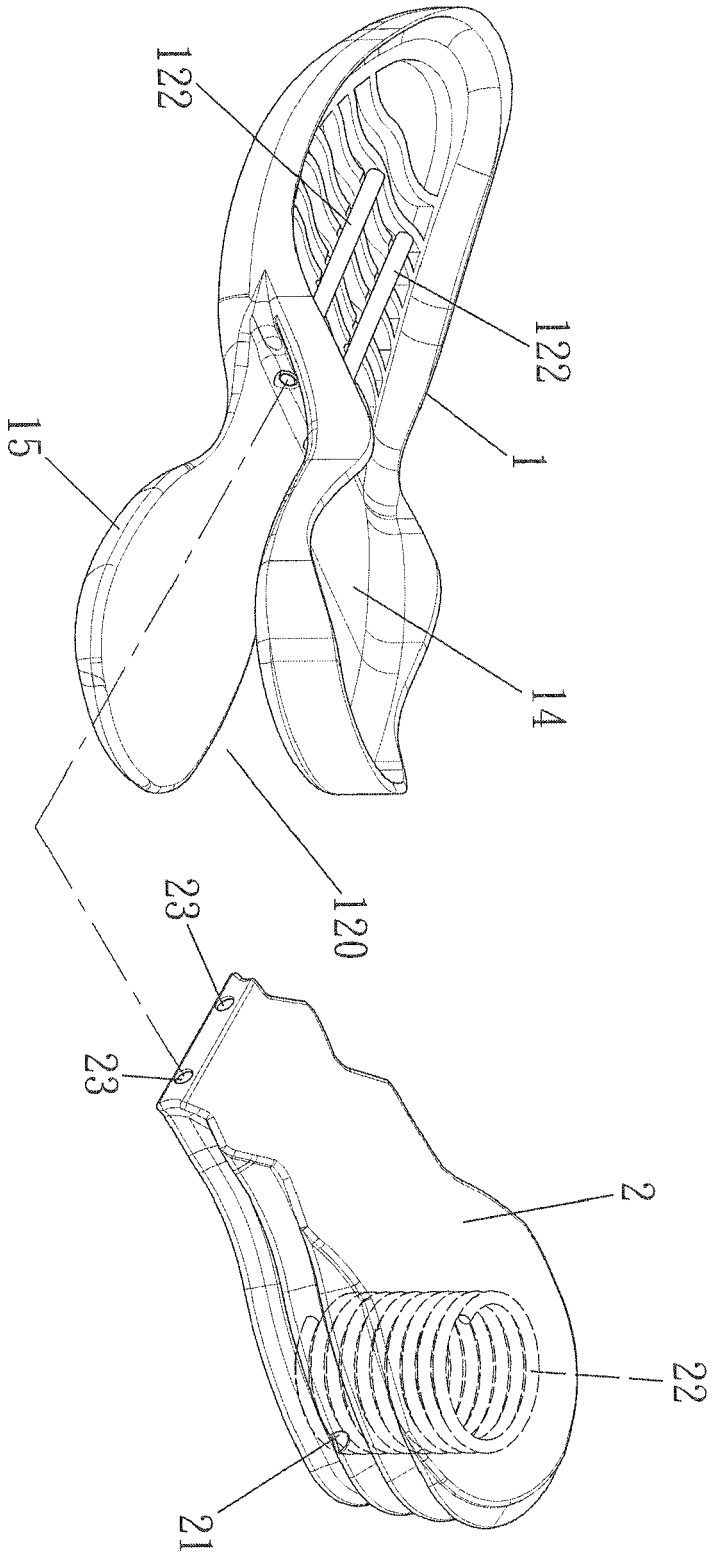


FIG. 7

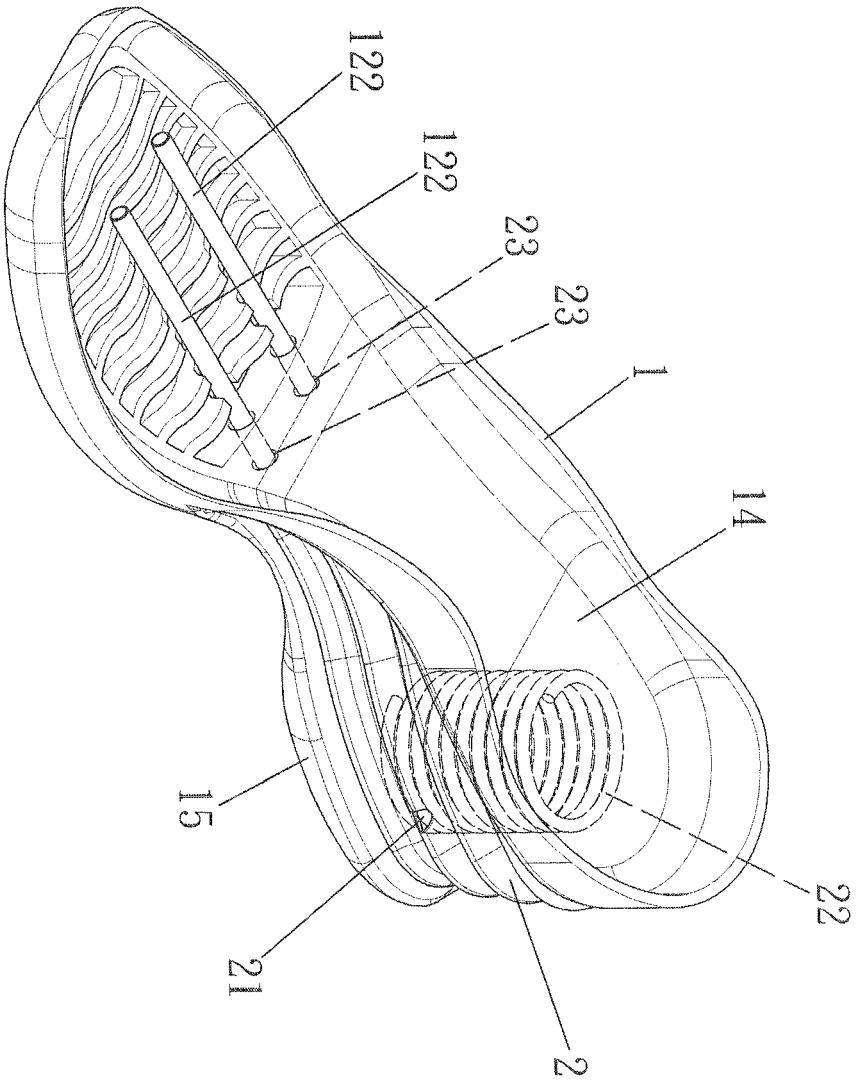


FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 08 16 9640

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	FR 2 670 369 A (COLESNICENCO NICULAE) 19 June 1992 (1992-06-19) * page 1, lines 16-19 * * page 3 - page 4; figures 5,6 *	1-4	INV. A43B7/08 A43B13/18
Y	US 2006/156575 A1 (LO CHIE-FANG [TW]) 20 July 2006 (2006-07-20) * paragraph [0019] - paragraph [0024]; figures *	1-4	
Y	US 3 180 039 A (BURNS JR JAMES F) 27 April 1965 (1965-04-27) * the whole document *	1-4	

TECHNICAL FIELDS SEARCHED (IPC)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 April 2009	Herry, Manuel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 16 9640

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-04-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2670369 A	19-06-1992	NONE	
US 2006156575 A1	20-07-2006	NONE	
US 3180039 A	27-04-1965	NONE	

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82