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(54) **SHOE AIR VALVE**

(57) The invention relates to an air valve for a shoe which is connected to the side wall of the shoe. The inventive valve is intended to communicate the network of internal channels in the shoe with the external environment in order to replenish the air in the aforementioned space inside the shoe. The valve comprises an essentially elongated body having a generally prismatic shape and a rectangular section. Moreover, the valve is provided with flared sections at the ends thereof, said ends being separated by a distance that is equal to the

thickness of the wall to which said valve is connected. Furthermore, the body is provided with a longitudinal axial through hole, said hole containing a wedge-like projecting element and an opposing groove which is disposed in the opposite wall of the hole. In this way, the wedge and the groove fit together in a hermetic manner when the pressure produced by the weight of the user is transmitted to the wall of the valve.

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Description

Object of the Invention

[0001] The present invention refers to an air valve for footwear, which provides essential novelty features and significant advantages with respect to the known means used for the same purposes in the current state of the art.

[0002] More specifically, the invention proposes the development of a valve susceptible to being fitted to the wall of a sole for footwear, with a view to placing the network of internal channels formed in the space inside the sole in free-flowing communication with the external environment for the circulation of air underneath the foot of the wearer, for the purpose of renovating said inner air, said valve being manufactured in a flexible material, and having a passage susceptible to being hermetically closed when the wearer rests the foot and discharges his or her weight on the portion to which the aforementioned valve is fitted, thus avoiding a possible undesired entry of water or of any other liquid or dusty material.

[0003] The field of application of the invention is obviously comprised within the industrial sector dedicated to the manufacture of footwear in general.

Background and Summary of the Invention

[0004] The fact that footwear manufacturers make continuous efforts to adapt their products for a better and more comfortable use on the part of the wearer, is generally known. In this sense, and with a view to maintaining a suitable foot hygiene, the practice of providing a multitude of channels inside the sole so as to allow the air to circulate therethrough, thus refreshing the sole of the foot and avoiding undesired harmful perspiration, has been known for quite a long time.

[0005] To this end, some footwear soles provided with air inlet/outlet elements already incorporate additional elements, placed in determined positions of the sole, generally in correspondence with the area of the heel, which go through the side wall of the sole, and which thus freely communicate the inner space with the external environment.

[0006] These devices, although efficient for the purpose of communication with the outside, have the drawback of normally being bodies of a stiffened material which are kept open, and which thus allow the entry of water, moisture, dust, etc., towards the space inside the sole, thereby leading to undesired and inconvenient situations for the foot of the wearer.

[0007] Taking the drawbacks of the prior art into consideration, the present invention has developed a valve which allows for effective solutions to the problems set forth, and by means of which, in normal conditions, the exchange of air is allowed between the space inside the sole and the external environment, with a view to the renewal of the air in contact with the foot of the wearer,

whereas in the position of the sole resting on the ground, i.e. as the wearer rests his or her weight on the footwear, the aforementioned valve closes its passage, due to the weight discharged thereon, avoiding the undesired entry of any liquid or water towards the inside.

[0008] In order to fulfil this operation, the valve has been manufactured in a highly flexible material, preferably of the elastomeric type, as a single part, with a generally elongated form and provided with end flaps separated by a body portion of such length as to be somewhat greater than the thickness of the wall to which it is to be fitted. The aforementioned body has a hole extending along the entire length thereof, whilst at an intermediate position inside said through hole, a transversely projecting protuberance has been formed, with a wedge-shaped section, placed opposite a groove or indentation carried out on the opposite part of the wall of said hole, and provided with a shape equivalent to that adopted by said protuberance. In this way, when the protuberance is introduced inside the groove and is flattened into this position as a result of the weight of the wearer, an airtight seal of said passage occurs, thus preventing the entry of water or any other liquid or dust from the external environment towards the space inside the sole.

Brief Description of the Drawings

[0009] These and other features and advantages of the invention will become more clearly apparent from the following detailed description of a preferred embodiment, given only as an illustrative and non-limiting example, with reference to the attached drawings, in which:

Figure 1 shows a diagrammatic view of a valve manufactured according to the teachings of the present invention;

Figures 2 and 3 also show diagrammatic views of the operations of fitting a valve of the invention to a sole for footwear, and

Figure 4 shows a diagrammatic view of a valve of the invention fitted to a sole for footwear, in an operative position.

Description of the Preferred Embodiment

[0010] In order to carry out the detailed description of the valve of the invention, continued reference will be made to the figures of the attached drawings, throughout which the same numerical references have been used to indicate identical or similar parts.

[0011] Thus, firstly following Figure 1, a diagrammatic representation of a valve of the invention can be observed, according to end elevational and side elevational views thereof. The valve consists of a body 1, of a

generally elongated form, approximately prismatic with a rectangular section, and provided with certain convergence at a determined portion of two side walls opposite said body 1. At both ends of the body 1, the formation of flared sections 2, 3 has been arranged, of which one flared section 3 corresponding to the end for the introduction of the valve into the housing of the sole, adopts a form favourable to said introduction, and to this end, the perimetral brims have been bent slightly inwards. On the other hand, the other flared end section 2 has a completely flattened inner wall, for the purpose of providing a suitable support surface against the outer side of the wall of the sole to which it is applied.

[0012] Going through the entire length of the body, the formation of a hole 4 has been arranged, sufficiently wide so as to allow an efficient exchange of air between both ends of the body, in a central position with respect to the latter, whereas at a predetermined distance of the passage thereof, the hole 4 has the formation of a transverse protuberance 5 in one of the walls thereof, outwardly projecting in a wedge shape, having an approximate wedge-shaped section, the opposite wall having the formation of a groove 6 in a correspondingly opposite position to said protuberance 5, with a shape equivalent to said protuberance 5.

[0013] As set forth in the foregoing, the material with which the valve has been manufactured preferably consists of an elastomeric material, easily flexible and sufficiently resilient so as to ensure its recovery when it is not subjected to any type of pressure.

[0014] If now observing Figures 2 to 4, the same different states of the assembly of the valve in a sole 7 for footwear are shown. To this end, the sole 7 includes a hole 8 at a predetermined position, going through the side wall thereof, and which will preferably be arranged in correspondence with the side wall of the heel. The through hole 8 is dimensioned such that it allows the tight fitting of the valve therein, as shown in the operative sequences of both Figures 2 and 3, up to the final fitting position shown in Figure 4.

[0015] As can be observed, the flexibility and resilience of the material with which the body 1 of the valve has been manufactured allows the brims of the flared front portion 3 to bend as a result of the inward pushing force, going through the hole 8 of the sole 7, this operation being favoured by the convergent cuts carried out on both side walls of the front portion of the body 1 (Figure 3). Once the thickness of the wall of the sole 7 has been passed, the elastic recovery of the material of the valve causes the brims of the flared front portion 3 to spread out again and to place themselves against the inner side of said wall of the sole. For its part, the flared rear portion 2 adapts itself to the outer side of said wall of the sole 7, and the valve thus remains situated in its place as shown in Figure 4.

[0016] Preferably, the wall of the sole 7 will have a stepping 9 surrounding the hole 8 (see Figures 2 and 3), adapted so as to receive and partially house the

flared outer area 2 of the valve 1. A better fitting and an improved irremovability of the valve with respect to the sole 7 are thus ensured. Furthermore, if desired, an adhesive can be applied to said valve in order to ensure a greater immobilisation thereof with respect to the sole.

[0017] As will be understood, the operation of the valve proves extremely simple and secure. In fact, when no downward pressure is exerted on the wall of the sole 7 in which the body 1 of the valve is assembled, the hole 4 is clear, allowing an exchange between the air of the space inside the sole and the air of the external environment through the hole 4. This situation corresponds both to the state of the footwear not being used and to the state which occurs during walking, when the wearer lifts his or her foot during the successive steps.

[0018] However, when a sufficient pressure is downwardly exerted on the wall of the sole 7, as occurs, for example, when the wearer rests his or her foot during walking, the force derived from the exerted pressure causes the flattening of the material of the wall of the sole, and thus of the valve body, causing the protuberance 5 to be introduced inside the groove 6, and thereby hermetically sealing the communication between the inside and the outside through the hole 4. Since this situation basically corresponds to the state in which the sole is rested on the ground, the entry of water or any other liquid or dust present on the ground into the inner space is thus prevented, being able to ensure a perfect protection of the foot of the wearer.

Claims

1. An air valve for footwear, susceptible to being applied to a corresponding through hole carried out in a predetermined position of the wall of the sole in which the valve is to be assembled, and dimensioned so as to allow the tight housing of the latter therein, **characterised in that** said valve comprises a body (1) of a generally elongated shape, substantially prismatic of a rectangular section and with one portion thereof provided with convergent opposite walls, which body has flared end portions (2, 3) such that one (3) of said portions, determining the end for introduction into the housing hole, has inwardly curved brim projections intended for facilitating the operation of introduction, whereas the other flared end portion (2) has a considerably flattened inner side to constitute an effective limit and support side against the wall of the sole (7), said body (1) being further provided with a through hole (4) in one wall of which a transverse protuberance (5) has been formed at an intermediate position, with an approximate wedge-shaped section, whereas in the opposite wall, at a correspondingly opposite position to said protuberance (5), a groove (6) has been formed with the same configuration as said protuberance (5), and dimensioned so as to receive and

tightly house the latter when sufficient pressure is exerted on the wall of the sole (7).

2. A valve according to claim 1, **characterised in that** the wall of the sole (7) provided with the hole (8) for housing the valve has a stepping (9) on the outer side surrounding said hole (8), adapted to the dimensions of the flared end portion (2) of the body (1) of the valve. 5 10
3. A valve according to claim 1, **characterised in that** said valve is of the single piece type, and is manufactured in a resilient and flexible material, preferably an elastomeric material. 15

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INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER		
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According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 : A43B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
MISTRAL, EPODOC, WPIL		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0319968 A3 (CHIKONG, C.) 14.06.1989. the whole document	1,3
A	EP 1093729 A1 (YAMAMOTO LILITED) 25.04.2001 abstract ; Column 3; abstract 1; pages 3-5	1
A	DE 4339104 A (ENGROS SCHUHHAUS) 18.05.1995 abstract , figures.	1
A	ES 1046430 U (AGNELLI S. L) 16.12.2000 the whole document	1
A	ES 2171917 U (JALLATTE) 16.09.2002. the whole document	1-3
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0319968 A	14.06.1989	CN 1033440 A JP 1262801 A DE 3889640 D	21.06.1989 19.10.1989 23.06.1994
EP 1093729 A	25.04.2001	NONE	
DE 4339104 A	18.05.1995	WO 9513714 A DE 9321406 U	26.05.1995 06.11.1997
ES 1046430 U	16.12.2000	NONE	
ES 2171917 U	16.09.2002	NONE	