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54 **One way air-flow shoes.**

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**FR-A- 2 185 920**  
**GB-A- 21 944**  
**GB-A- 2 193 080**  
**US-A- 2 098 412**

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## Description

The invention relates to a shoe having a sole, a shoe upper, an one way inlet valve permitting only flow of air from the atmosphere into the interior of the shoe and an one way outlet valve permitting only flow of air from the interior of the shoe towards the atmosphere.

There are known shoes having air ventilation holes through which circulate fresh air and stale air. The ventilation effect of said known structures is unsatisfactory and there is also a risk that water comes inside the shoes when said shoes are used on a rainy day.

GB-2,193,080 shows a shoe having an one way inlet valve in communication with a reservoir in the sole, said reservoir in the sole being in communication with the interior of the shoe via a one way outlet valve mounted in the sole.

Further US-A-2,098,412 shows a shoe having ventilation openings at the side of the sole which are in communication with channels in the sole. Said channels are in communication with the interior of the shoe via a multiplicity of small perforations in the sole.

According to the invention the one way inlet valve has been mounted on the shoe upper and is in open communication with the interior of the shoe whilst said interior via holes in the sole and at least one channel is in communication with the one way outlet valve which has been mounted also on the shoe upper.

In this way there could be obtained an effective aerating of the interior of the shoe during use.

The objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which

Fig. 1 shows a shoe according to the invention in perspective view.

Fig. 2 shows a sectional view of the shoe according to line A-A in Fig. 1.

Fig. 3 shows a sectional view of the shoe according to line B-B in Fig. 1.

Fig. 4 shows a perspective view of a non return valve permitting flow of air out of the interior of the shoe.

Fig. 5 shows a perspective view of a non return valve permitting flow of air towards the interior of the shoe.

Fig. 6 shows a perspective view of an insole of the shoe.

Fig. 7 shows a perspective view of an assembled non return valve

As shown in the figures on one side of the shoe there have been provided on the outside upper 9 two one way valves A and A' whilst on the other side of the shoe on the inside upper there

have been provided in a similar way two one way valves B and B'.

The one way valves A and A' permitting only flow of air from the atmosphere into the interior of the shoe each comprise a cap 1 with various separated inlet holes 3. The cap 1 has been provided with a groove 2 for accommodating an annular rim 8 united with a plate shaped part 7.

In the area of the plate shaped part 7 surrounded by the rim 8 there has been provided airholes 6. Between the plate shaped part 7 and the cap 1 there has been arranged a plate 4 and a spring 5 so that the spring 5 tends to push the plate 4 against the cap 1 for preventing flow of air through the valve. As appears from fig. 1 the valve is mounted on the shoe by fixing the plate shaped parts between parts of the upper 9.

The structure of the non return valves B and B' is similar to the structure of valves A and A' and the various parts of said valves B and B' have been indicated with the same reference numbers as corresponding parts of the valves A and A' with addition of a suffix.

However from the drawings it will be clear that the valves B and B' mounted in the inside upper only admit flow of air from the inside of the shoe towards the atmosphere.

Further in the shoe there has been arranged an insole 14 having a sill 15 at its outer edge and extending partly along the inner side of the inside upper.

The interior of the shoe is in communication with passages 12 arranged in the lower side of the insole 14 through holes 11. Passages 12 are in communication with the valve B' through passages extending along parts 13 of the insole 14 (fig. 2).

When the user of the shoes according to the invention steps on the ground, the stale and warm air which is inside the airway passages (12) of insole (14) will be forced out through the one way air-out valve (B') via arch parts (13) of insole 14 and stale air inside the shoe will be forced out through the one way air-out valve (B) of the front part.

When, on the other hand the user of the shoes according to the invention put his foot forward only fresh air will flow into the interior of the shoe through non return valves A and A' which are stitched on the front part and middle part of outside upper 9.

So by the arrangement according to the invention there is obtained an one way air ventilation continuously during walking as only fresh air flows into the shoes through the one way valves A, A' and only stale air flows out through the one way valves B, B'.

One way valve B', which is on the middle part of inside upper, discharges the stale air out concentrated in the passages 12 and 13 of insole 14 in

every step.

One way valve B which is on the front part of inside upper, discharges the stale air out concentrated in shoe inside operating with the insole which prevents the stale air of passage 12 and air holes 11 from flow backward with the frame sill 15 of the insole 14.

### Claims

1. Shoe having a sole, a shoe upper (9), an one way inlet valve (A, A'), permitting only flow of air from the atmosphere into the interior of the shoe and an one way outlet valve (B, B') permitting only flow of air from the interior of the shoe towards the atmosphere, characterized in that the one way inlet valve (A, A') has been mounted on the shoe upper (9) and is in open communication with the interior of the shoe whilst said interior is in communication with the one way outlet valve (B, B') which has been mounted also on the shoe upper (9), via holes (11) in the sole (14) and at least one channel (12).
2. Shoe according claim 1, characterized in that the inlet valve (A, A') has been mounted on one side of the shoe and an outlet valve (B, B') on the other side.
3. Shoe according claim 1 or 2, characterized in that on each side of the shoe there has been mounted two valves (A, A'; B, B').
4. Shoe according any one of the preceding claims characterized in that an outlet valve (B, B') is in communication with a space below an insole (14) of the shoe, said space being in communication with the interior of the shoe via the holes (11).
5. Shoe according any of the preceding claims characterized in that a valve (A, A'; B, B') comprises a plate shaped portion (7, 7') arranged between layers of the shoe upper (9).
6. Shoe according claim 5, characterized in that the plate shaped portion (7, 7') has been provided with an annular rim (8) having its edge housed in a groove (2) provided in a cap like member (1) of a valve (A, A'; B, B') whilst between the cap like member (1) and the plate shaped portion (7, 7') there has been arranged a spring (5) and a valve plate (4).

### Patentansprüche

1. Schuh mit einer Sohle, einem Schuhoberteil (9), einem Einweg-Einlaßventil (A,A'), welches die Passage eines Luftstroms lediglich von der Außenumgebung in den Schuhinnenraum zuläßt, und einem Einweg-Auslaßventil (B,B'), das die Passage eines Luftstroms lediglich von dem Schuhinnenraum in die Außenumgebung zuläßt, dadurch **gekennzeichnet**, daß das Einweg-Einlaßventil (A,A') auf dem Schuhoberteil (9) angeordnet ist und in offener Verbindung mit dem Schuhinnenraum steht, während der Schuhinnenraum mit dem ebenfalls auf dem Schuhoberteil (9) angeordneten Einweg-Auslaßventil (B,B') über Löcher (11) in der Sohle (14) und mindestens einen Kanal (12) verbunden ist.
2. Schuh nach Anspruch 1, dadurch **gekennzeichnet**, daß das Einlaßventil (A,A') auf einer Seite des Schuhs und das Auslaßventil (B,B') auf der anderen Seite angeordnet ist.
3. Schuh nach Anspruch 1 oder 2, dadurch **gekennzeichnet**, daß auf jeder Schuhseite zwei Ventile (A,A'; B,B') angeordnet sind.
4. Schuh nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß das Auslaßventil (B,B') in Verbindung mit einem Raum unterhalb einer Innensohle (14) des Schuhs steht, wobei dieser Raum mit dem Schuhinnenraum über die Löcher (11) verbunden ist.
5. Schuh nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß ein Ventil (A,A'; B,B') einen plattenförmigen Abschnitt (7,7') enthält, der zwischen den Lagen des Schuhoberteils (9) angeordnet ist.
6. Schuh nach Anspruch 5, dadurch **gekennzeichnet**, daß der plattenförmige Abschnitt (7,7') einen ringförmigen Kranz (8) aufweist, dessen Kante in einer Nut (2) aufgenommen ist, die in einem kappenförmigen Teil (1) des Ventils (A,A'; B,B') vorgesehen ist, während zwischen dem kappenförmigen Teil (1) und dem plattenförmigen Abschnitt (7,7') eine Feder (5) und eine Ventilplatte (4) angeordnet ist.

## Revendications

1. Chaussure comprenant une semelle, une tige de chaussure (9), une valve d'entrée unidirectionnelle (A, A'), autorisant uniquement l'écoulement d'air de l'atmosphère vers l'intérieur de la chaussure et une valve de sortie unidirectionnelle (B, B'), autorisant uniquement l'écoulement d'air de l'intérieur de la chaussure vers l'atmosphère, caractérisée en ce que la valve d'entrée unidirectionnelle (A, A') a été montée sur la tige de la chaussure (9) et est en communication ouverte avec l'intérieur de la chaussure tandis que ledit intérieur est en communication avec la valve de sortie unidirectionnelle (B, B') qui a aussi été montée sur la tige de la chaussure (9), par l'intermédiaire de trous (11) dans la semelle intérieure (14) et d'au moins un canal (12).
 

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2. Chaussure selon la revendication 1, caractérisée en ce que la valve d'entrée (A, A') a été montée sur un côté de la chaussure et une valve de sortie (B, B') sur l'autre côté.
 

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3. Chaussure selon la revendication 1 ou 2, caractérisée en ce que sur chaque côté de la chaussure, on a monté deux valves (A, A' ; B, B').
 

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4. Chaussure selon l'une quelconque des revendications précédentes, caractérisée en ce qu'une valve de sortie (B, B') est en communication avec un espace en dessous d'une semelle intérieure (14) de la chaussure, ledit espace étant en communication avec l'intérieur de la chaussure par l'intermédiaire des trous (11).
 

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5. Chaussure selon l'une quelconque des revendications précédentes, caractérisée en ce qu'une valve (A, A' ; B, B') comprend une partie en forme d'assiette (7, 7') disposée entre des couches de la tige de la chaussure (9).
 

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6. Chaussure selon la revendication 5, caractérisée en ce que la partie en forme d'assiette (7, 7') a été munie d'un rebord annulaire (8) dont le bord est logé dans une gorge (2) prévue dans un élément en capuchon (1) d'une valve (A, A' ; B, B') tandis qu'entre l'élément en capuchon (1) et la partie en forme d'assiette (7, 7'), on a disposé un ressort (5) et une plaquette de valve (4).
 

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FIG. 1

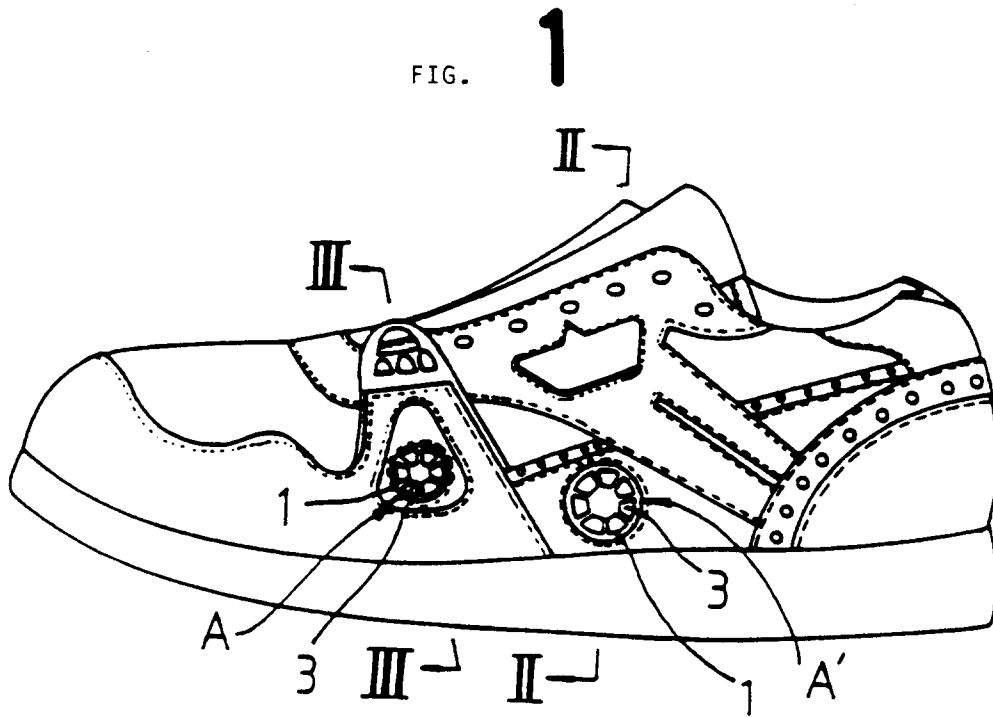


FIG. 2

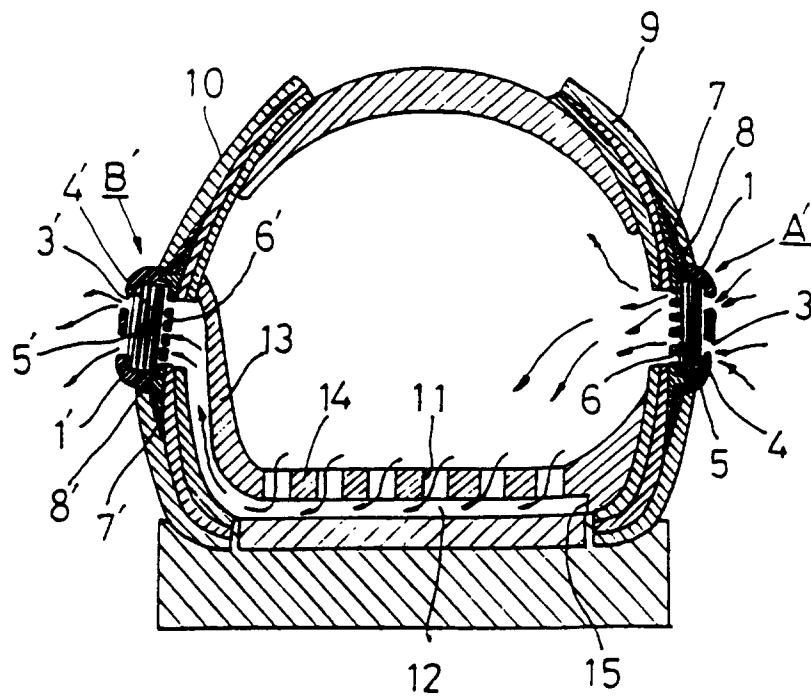


FIG. 3

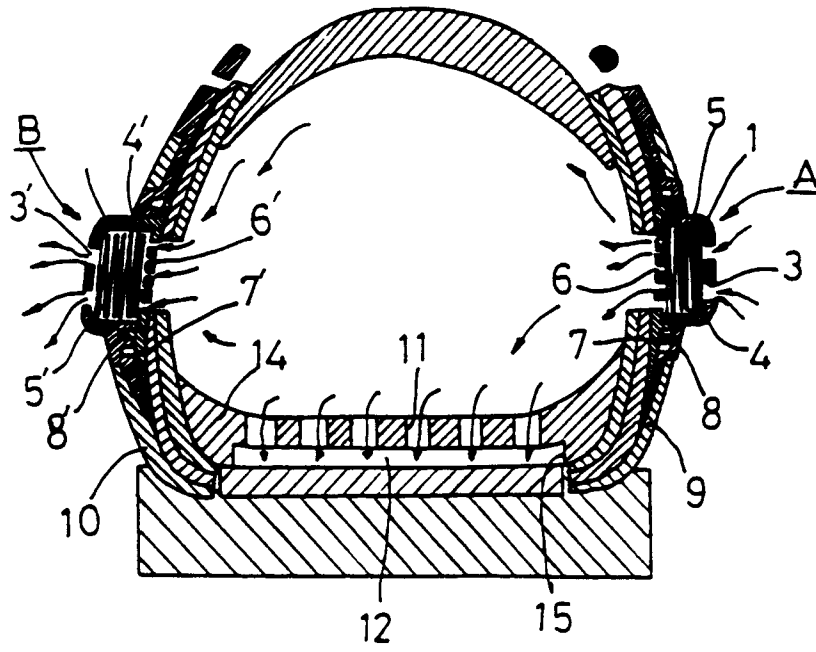


FIG. 4

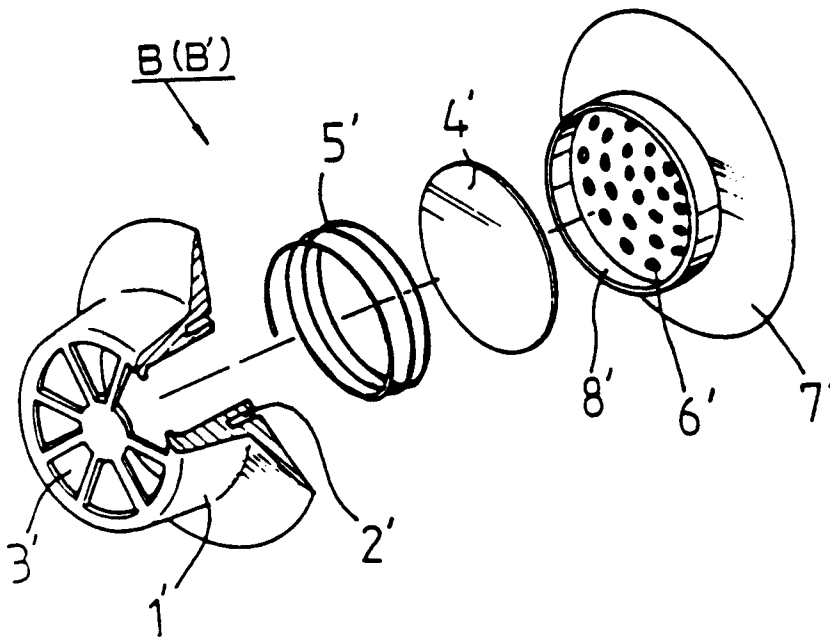


FIG. 5

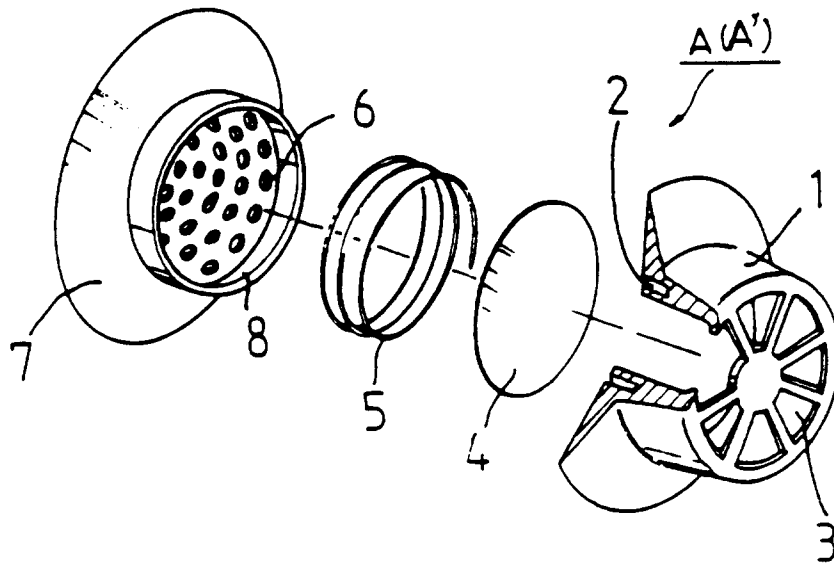


FIG. 6

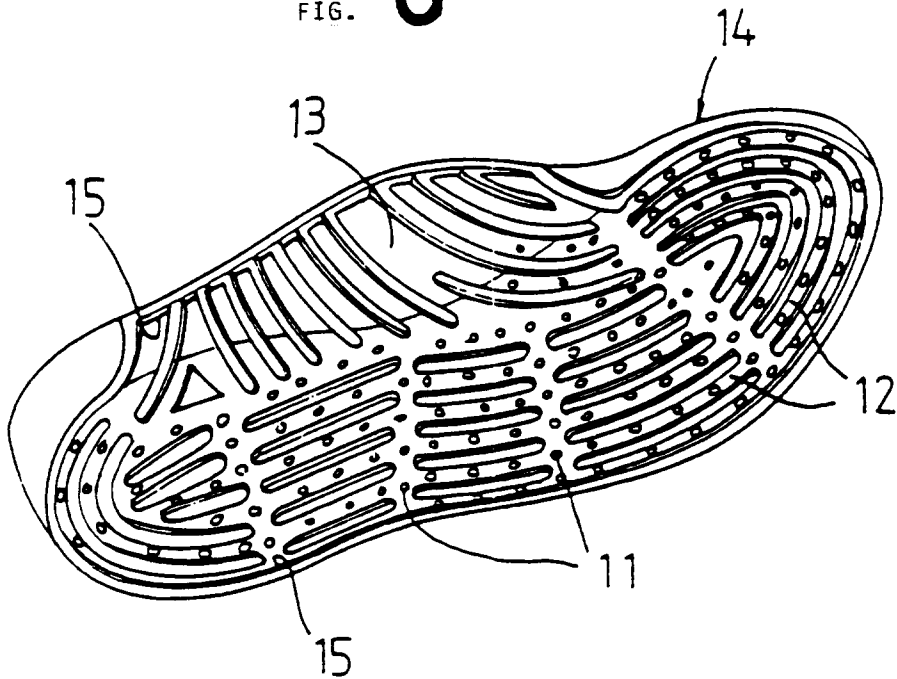


FIG. 7

