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HIGH TRANSPIRING FOOTWEAR

DESCRIPTION

5 This invention generally relates to the footwear industry
and, more particularly, an improved footwear adapted to
facilitate the outward dispersion of the aqueous vapour
which is produced by transpiration of the foot within the
footwear while walking, while assuring at the same time
10 good waterproofing and thermal insulation from the outside
environment.

In the footwear manufactured according to conventional
manufacturing methods and by the use of customary materials,
15 the outward dispersion of the aqueous vapour produced within
the footwear mainly occurs through the upper and the tongue,
while dispersion through the sole is extremely low. As a
matter of fact, the use of glue rather than the more
expensive seam for joining the outer sole to the inner sole
20 and the use of soles made of rubber and/or thermoplastic
material for thermal insulation and waterproofing purposes
make the drainage of the aqueous vapour produced by
transpiration a very difficult problem to solve.

25 Consequently, in the conventional footwear, only the aqueous
vapour transpiring from the upper portion and side portion
of the foot can be dispelled, while the aqueous vapour
transpiring in greater amount from the foot sole cannot be
dispelled.

30 To overcome this drawback, soles of rubber and/or
thermoplastic material with a perforated structure which
permits the aqueous vapour produced by the foot sole to be

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dispelled have already been made.

However, also footwear with a rubber sole or the like having a perforated structure are unsatisfactory from this point of view because the holes provided for transpiration become easily plugged up when the soles come in contact with a dusty or dirty ground and, furthermore, they have the drawback of causing the cold air unavoidably contacting the foot bottom surface to be drawn from the outside, causing a bothersome feeling.

The object of the invention is to overcome said drawbacks by providing a footwear in which aqueous vapour caused by transpiration from the upper portion and side portion of the foot and, moreover, from the foot bottom surface can be quickly and efficiently dispelled, while preventing at the same time moisture and cold air coming from the outside from penetrating within the footwear.

More particularly, the footwear according to the invention is characterized in that it comprises:

- a middle sole made of a material that can absorb the aqueous vapour transpiring from the foot bottom surface and dispel it outwardly from the sides thereof,
- a thin strap made of the same material as the upper that encloses the peripheral portion of the middle sole and is provided with inwardly folded edges directed towards the inner of said middle sole,
- said thin strap being sewed to the middle sole in order to prevent the material forming it from absorbing moisture coming from the outside, without jeopardizing its ability to dispel the aqueous vapour outwardly, while providing at the same time a soft and steady support for the foot.

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Advantageously, the upper of the footwear is internally lined with a two-layer lining, the first layer which contacts the foot being made of a material that easily absorbs the aqueous vapour transpiring from the upper portion and side portion of the foot, and the second layer interposed between the first layer and the upper being made of a material that easily absorbs the aqueous vapour from the first layer and dispels it outwardly through the upper.

10 The features and advantages offered by the footwear of the invention will be better understood from the following detailed description of its preferred embodiments, in connection with the accompanying drawings, wherein:

Fig. 1 is a longitudinal sectional view of a footwear according to the invention,

Fig. 2 is a cross sectional view along line II-II of Fig. 1 of a footwear according to a first embodiment of the invention, and

Fig. 3 is a cross sectional view similar to Fig. 2 of a footwear according to a second embodiment of the invention.

The footwear 10 according to the invention described with reference to Fig. 2 has a tubular upper 11. The lower portion of the tubular upper 11, which in this case acts as an inner sole 12, is perforated in order to let the aqueous vapour transpiring from the foot sole to pass through and into the middle sole 15 which is interposed between said tubular upper 11 and the outer sole 14 which is the proper sole of the footwear. The middle sole 15 is made of a material with open and interconnected cells that can easily absorb the aqueous vapour coming from the inside of the footwear 10 and dispel it outwardly from the side, urged in so doing by the pressure exerted by the foot while walking,

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said middle sole 15 providing at the same time a soft and steady support for the foot.

5 Preferably, but not necessarily, the material of which the middle sole 15 is made is a porous foam of polyurethane having microcells, e.g. the known material which is commercially available under the trademark PORON^R and which has up to 35 million of open and interconnected microcells per square meter.

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A thin strap 16 made of the same material as the tubular upper 11, with its inwardly folded edges directed towards the inner portion of the middle sole 15 encloses the outer peripheral portion thereof. A finishing seam 17 connects the inwardly folded edges of the thin strap 16 to the middle sole 15.

20 Besides its clear aesthetical purpose, the thin strap 16 is aimed at preventing the material forming the middle sole 15 from absorbing moisture coming from the outside, while not jeopardizing the ability to dispel the aqueous vapour outwardly since glue is not used.

25 The assembly of the footwear 10 is completed by attaching the tubular upper 11 to the middle sole 15 with a joining seam 18 that also passes through the inwardly folded edges of the thin strap 16 and by glueing to such assembly an outer sole 14 which can be made of leather, rubber, thermoplastic material or the like.

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In Fig. 3, the footwear 10 of the invention is of the type having a non tubular upper and like the footwear of Fig. 1, it comprises a middle sole 15 made of a foam of polyurethane

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having microcells the outer peripheral portion of which is enclosed by a thin strap 16 made of the same material as the upper 11 and with its inwardly folded edges directed towards the inner portion of the middle sole 15, said edges being
5 sewed to said middle sole 15 by means of a finishing seam 17.

The middle sole 15 is joined to the welts of the upper 11 by means of a joining seam 18 which passes through the thin
10 strap 16 and the inner sole 12, said inner sole 12 being provided with holes which let the aqueous vapour transpiring from the foot bottom surface to pass through and into the middle sole 15.

15 The subsequent glueing of an outer sole 14 of leather, rubber, thermoplastic material or the like to such assembly completes the assembly operation of the footwear 10.

In the preferred embodiments, the upper 11 of the footwear
20 is made of leather, fabric or another material that permits transpiration and is treated by conventional means in order to assure weatherproofness without jeopardizing its transpiration capability. Preferably, the upper is internally lined with a two layer lining, known per se, the
25 first layer which contacts the foot being made of a material that easily absorbs the aqueous vapour transpiring from the upper portion and side portion of the foot, and the second layer which is interposed between the first layer and the upper being made of a material, e.g. a polyester, that
30 easily absorbs the aqueous vapour from the first layer and dispels it outwardly through the upper. The transpiration from the upper portion of the foot is made easier also by providing the tongue with small holes.

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Although the footwear according to the invention has been disclosed and illustrated in connection with two preferred embodiments only, it is apparent that all changes and modifications can be made thereto by those skilled in the art without departing from the scope of this invention.

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CLAIMS

1) Footwear having an upper (11), an inner sole (12) and an outer sole (14), characterized in that it comprises:

5 - a middle sole (15) made of a material that can absorb the aqueous vapour transpiring from the foot bottom surface and dispel it outwardly from the sides thereof,

10 - a thin strap (16) made of the same material as the upper (11) that encloses the peripheral portion of the middle sole (15) and is provided with inwardly folded edges directed towards the inner of said middle sole (15),

15 - said thin strap (16) being sewed to the middle sole (15) in order to prevent the material forming it from absorbing moisture coming from the outside, without jeopardizing its ability to dispel the aqueous vapour outwardly, while providing at the same time a soft and steady support for the foot.

20 2) Footwear according to claim 1, characterized in that the material forming the middle sole (15) is a foam of polurethane having open and interconnected microcells.

25 3) Footwear according to claim 1, characterized in that, in the case of a tubular upper (11), a joining seam (18) passing through the two edges of the thin peripheral strap (16), the middle sole (15) and the upper (11) is provided, the bottom of the tubular upper (11) acting as an inner sole (12) and being provided with holes for permitting the aqueous vapour to pass therethrough.

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4) Footwear according to claim 1, characterized in that, in case of a non tubular upper (11), a joining seam (18)



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passing through the two edges of the thin peripheral strap (16), the welts of the upper (11) and the inner sole (12) is provided, said inner sole (12) being provided with holes for permitting the aqueous vapour to pass therethrough.

- 5 5) Footwear according to claim 1, characterized in that the upper (11) of the footwear is internally lined with a two-layer lining, the first layer which contacts the foot being made of a material that easily absorbs the aqueous vapour transpiring from the upper portion and side portion
10 of the foot, and the second layer interposed between the first layer and the upper (11) being made of a material that easily absorbs the aqueous vapour from the first layer and dispels it outwardly through the upper (11).

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