



US 20230270209A1

(19) **United States**

(12) **Patent Application Publication**

Winn

(10) **Pub. No.: US 2023/0270209 A1**

(43) **Pub. Date: Aug. 31, 2023**

(54) **FOOTWEAR INSOLE**

(71) Applicant: **Paul C. Winn**, Phoenix, AZ (US)

(72) Inventor: **Paul C. Winn**, Phoenix, AZ (US)

(21) Appl. No.: **17/682,137**

(22) Filed: **Feb. 28, 2022**

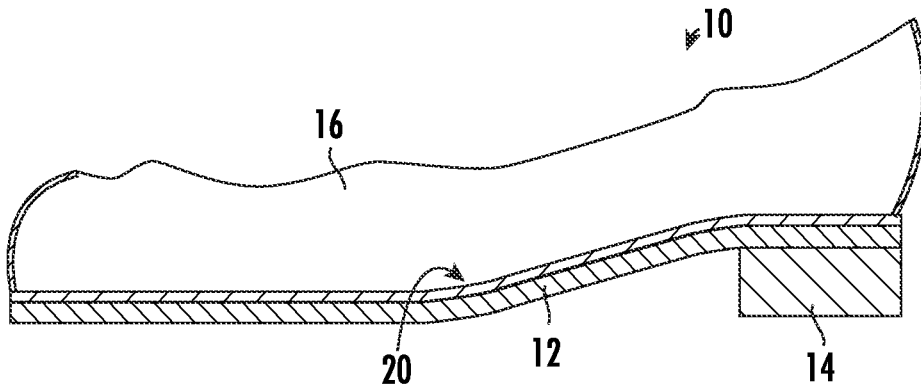
Publication Classification

(51) **Int. Cl.**
A43B 17/10 (2006.01)
A43B 13/20 (2006.01)

(52) **U.S. Cl.**
CPC *A43B 17/107* (2013.01);
A43B 13/20 (2013.01)

(57) **ABSTRACT**

A footwear insole includes a base layer configured to overlie a sole of an article of footwear, a moisture permeable layer overlying the base layer, and an airgap structure captured between the base layer and the moisture permeable layer. Perimetric edges of the base layer, the airgap structure and the moisture permeable layer are aligned to form an insole perimetric edge.



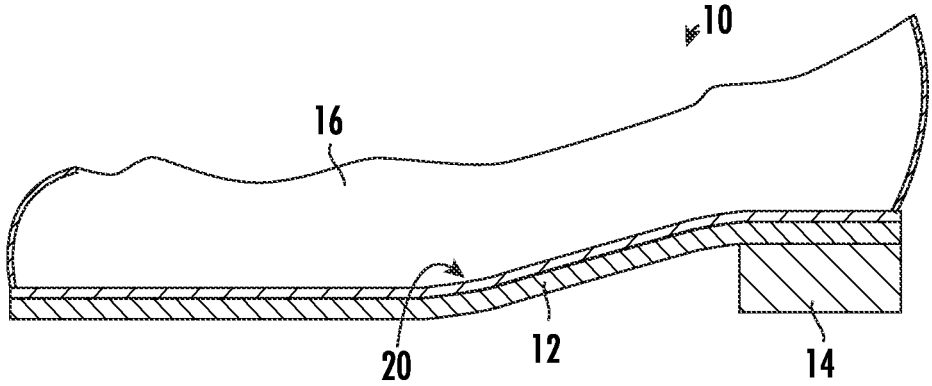


FIG. 1

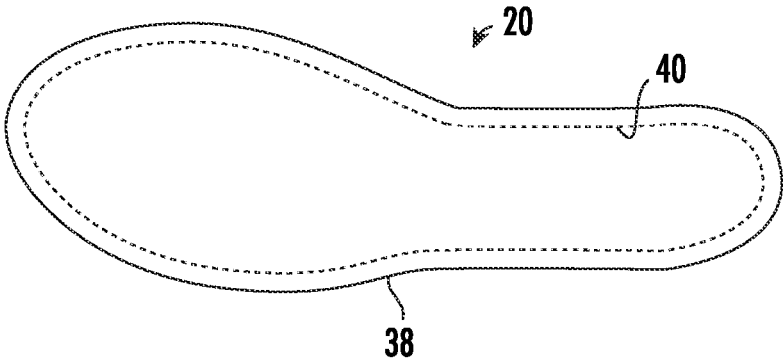


FIG. 2

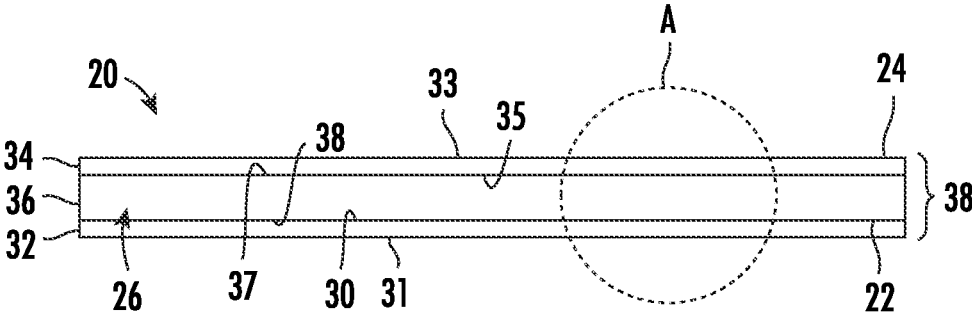


FIG. 3

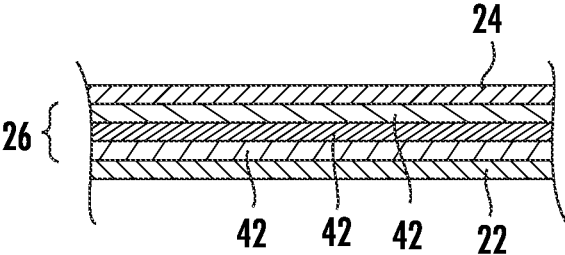


FIG. 4

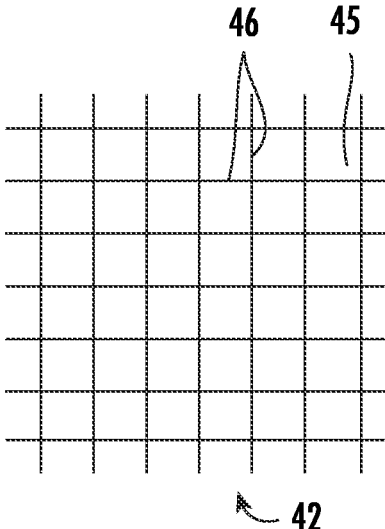


FIG. 5

FOOTWEAR INSOLE

FIELD OF THE INVENTION

[0001] The present invention relates generally to insoles for footwear.

BACKGROUND OF THE INVENTION

[0002] Insoles for footwear have long been known and used. The insole is the inside part of the shoe above the sole that runs underneath and supports the bottom of an individual's foot. Insoles are usually easily removed and therefore, easily replaced. Insoles are often used to make a shoe more comfortable, control odor, and cushion the foot. For health-related reasons, orthotic insoles can better position and support the foot. Currently, insoles are typically fabricated of thermoplastic material, a plastic polymer that is heated and molded to the shape of the foot, providing comfort and arch support. Feet take a lot of stress, and when that stress isn't properly absorbed it can cause injury and pain in ankles, knees and hips. Insoles are typically used to absorb shock, evenly distribute weight and provide arch support.

[0003] While generally effective for providing support, insoles do not adequately address moisture accumulation. When walking, running or otherwise moving around, people's feet often sweat, resulting in a warm and moist environment inside the footwear. The accumulation of moisture around the feet can be detrimental to health and comfort. Control of moisture is often attempted using powders and the like.

[0004] It would be highly advantageous, therefore, to remedy the foregoing and other deficiencies inherent in the prior art.

SUMMARY OF THE INVENTION

[0005] According to the principle of the invention, a footwear insole includes a base layer having a top surface, a bottom surface and a perimetric edge, the base layer configured to overlie a sole of an article of footwear, a moisture permeable layer having a top surface, a bottom surface and a perimetric edge, the moisture permeable layer overlying the base layer, and an airgap structure having a top surface, a bottom surface and a perimetric edge, the airgap structure captured between the base layer and the moisture permeable layer with the top surface of the airgap structure adjacent to the bottom surface of the moisture permeable layer and the bottom surface of the airgap structure adjacent to the top surface of the base layer. The perimetric edges of the base layer, the airgap structure and the moisture permeable layer are aligned to form an insole perimetric edge. In a specific aspect, stitching is spaced from and parallel to the insole perimetric edge, fastening together the base layer, the airgap layer and the moisture permeable layer. The airgap structure includes multiple layers of a mesh material, each layer having crossing strands defining apertures therethrough.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Specific objects and advantages of the invention will become readily apparent to those skilled in the art from the following detailed description of illustrative embodiments thereof, taken in conjunction with the drawings in which:

[0007] FIG. 1 is a partial sectional side view of footwear employing an insole according to the present invention;

[0008] FIG. 2 is a top view of the insole according to the present invention;

[0009] FIG. 3 is a side view of the insole of FIG. 2;

[0010] FIG. 4 is an enlarged section view of a portion of the insole of FIG. 3; and

[0011] FIG. 5 is a top diagrammatic view of a ;

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] Turning now to the drawings in which like reference characters indicating corresponding elements throughout the several views, attention is directed to FIG. 1 which illustrates an article of footwear **10** including a sole **12** having an underlying heel **14** and an overlying upper portion **16**. Various footwear is well known in the art and will not be described in detail herein. An insole **20**, according to the present invention, is carried by article of footwear **10** overlying sole **12** and enclosed by upper portion **16** in a manner well known to insole use. While article of footwear **10** is illustrated as a shoe or boot, insole **20** can be employed with substantially any type of footwear having a sole to carry insole **20**, such as athletic shoes, golf shoes, hiking boots, work boots, slippers, sandals, dress shoes, women's shoes and men's shoes, children's shoes and the like. In the preferred embodiment, insole **20** is removably installable within article of footwear **10** and easily replaced. Thus, insole **20** will generally be installed after fabrication. However, one of ordinary skill in the art will understand that in some applications, insole **20** can be fixedly attached to sole **12** as a permanent or somewhat permanent element of article of footwear **10** and installed during fabrication.

[0013] Referring now to FIGS. 2 and 3, insole **20** is typically shaped to correspond to the shape of the sole of the article of footwear into which it will be inserted. Insole **20** includes a base layer **22** on the bottom, a moisture permeable layer **24** on top and an airgap structure **26** captured therebetween. While insole **20** is preferably flat in the preferred embodiment, it can be contoured as desired, including some properties of orthotic insoles or not. The primary function of insole **20** is to cushion the foot and prevent moisture accumulation by circulation of air through airgap structure **26**. Base layer **22** is a supporting layer which is preferably flat, but can be contoured, and fabricated of a material to give insole **20** a strong resilient base for support of moisture permeable layer **24** and airgap structure **26**. Base layer **22** has a top surface **30**, a bottom surface **31** and a perimetric edge **32**. Base layer **22** is configured to overlie sole **12** with bottom surface **31** adjacent thereto, and is preferably formed of a thermoplastic material, but can be formed from foams, plastics, leather, impregnated cloth and the like.

[0014] Moisture permeable layer **24** is positioned adjacent the foot of a wearer, has a top surface **33**, a bottom surface **35** and a perimetric edge **34**, and allows moisture from a wearers foot to pass through toward airgap structure **26**. Moisture permeable layer **24** can provide a moisture wicking characteristic, pulling moisture away from the adjacent foot, or can simply be permeable to allow quick drying. Natural and/or synthetic fibers can be used for moisture permeable layer **24**, such as cotton, nylon cloth, wool cloth, mixtures and the like.

[0015] Airgap structure **26** is captured between base layer **22** and moisture permeable layer **24**, and includes a perimetric edge **36**, a top surface **37** and a bottom surface **38**. Top surface **37** of airgap structure **26** is adjacent to bottom surface **35** of moisture permeable layer **24** and bottom surface **38** of airgap structure **26** is adjacent to top surface **30** of base layer **22**. Airgap structure **26** includes a plurality of apertures through which air can circulate. Insole **20** has an insole perimetric edge **38** including vertically aligned perimetric edges **32**, **34**, and **36** of base layer **22**, moisture permeable layer **34**, and airgap structure **36**, respectively. As can be seen with reference back to FIG. 2, base layer **22**, moisture permeable layer **24** and airgap layer **26** are fastened together to form insole **20** using stitching **40** adjacent to and parallel with perimetric edge **38**. Stitching is employed to prevent any obstruction of airflow through perimetric edge **36** of airgap layer **26**. Heat sealing, adhesives and the like can cause obstructions in perimetric edge **36** preventing airflow, and thus, preventing the proper functioning of insole **20** as will be described presently.

[0016] Turning to FIG. 4, a portion of insole **20**, indicated by broken circle A of FIG. 3, is shown in an enlarged cross section. Insole **20** includes base layer **22** and moisture permeable layer **24** with airgap structure **26** captured therebetween as described previously. Airgap structure **26** includes multiple layers **42** of a mesh material providing a resilient structure as well as air gaps to allow airflow to remove moisture from moisture permeable layer **24**. With momentary reference to FIG. 5, in the preferred embodiment, each layer **42** is a polypropylene mesh having a thickness of 0.012" and having apertures **45** defined by crossing strands **46**. Apertures **45**, in the preferred embodiment, have a size of 0.014". In this preferred embodiment, three of layers **42** are stacked to provide airgap structure **26**. While three layers are used in the preferred embodiment, it will be understood that more or less can be used depending upon the thickness of each layer. The thickness of airgap structure **26** must be sufficient to ensure sufficient air flow through perimetric edge **36** to facilitate drying of moisture permeable layer **24**.

[0017] As stated previously, perimetric edges **32**, **34** and **36** of base layer **22**, moisture permeable layer **24** and airgap structure **26**, respectively, are fastened together to form insole perimetric edge **38**. Fastening is accomplished using stitches **40** spaced from and parallel to perimetric edge **38**. Stitching is employed, rather than using heat bonding or adhesives, to prevent clogging of apertures **45**, particularly at perimetric edge **36** of airgap structure **26**.

[0018] The present invention is described above with reference to illustrative embodiments. Those skilled in the art will recognize that changes and modifications may be made in the described embodiments without departing from the nature and scope of the present invention. Various changes and modifications to the embodiments herein chosen for purposes of illustration will readily occur to those skilled in the art. To the extent that such modifications and variations do not depart from the spirit of the invention, they are intended to be included within the scope thereof.

1. A footwear insole, comprising:

a base layer having a top surface, a bottom surface and a perimetric edge, the base layer configured to overlie a sole of an article of footwear;

a moisture permeable layer having a top surface, a bottom surface and a perimetric edge, the moisture permeable layer overlying the base layer;

an airgap structure having a top surface, a bottom surface and a perimetric edge, the airgap structure captured between the base layer and the moisture permeable layer with the top surface of the airgap structure adjacent to the bottom surface of the moisture permeable layer and the bottom surface of the airgap structure adjacent to the top surface of the base layer; and

the perimetric edges of the base layer, the airgap structure and the moisture permeable layer aligned to form an insole perimetric edge.

2. The footwear insole according to claim 1, further including stitching spaced from and parallel to the insole perimetric edge, fastening together the base layer, the airgap layer and the moisture permeable layer.

3. The footwear insole according to claim 1, wherein the airgap structure further includes multiple layers of a mesh material, each layer having crossing strands defining apertures therethrough.

4. The footwear insole according to claim 3 wherein each of the multiple layers of a mesh material is a polypropylene mesh having a thickness of 0.012" and having apertures with a size of 0.014".

5. The footwear insole according to claim 4 wherein the multiple layers of a mesh material include at least three layers.

6. An article of footwear comprising:

a sole having a top surface; and

an insole comprising:

a base layer having a top surface, a bottom surface and a perimetric edge, the base layer overlying the sole with the bottom surface of the base layer adjacent to the top surface of the sole;

a moisture permeable layer having a top surface, a bottom surface and a perimetric edge, the moisture permeable layer overlying the base layer;

an airgap structure having a top surface, a bottom surface and a perimetric edge, the airgap structure captured between the base layer and the moisture permeable layer with the top surface of the airgap structure adjacent to the bottom surface of the moisture permeable layer and the bottom surface of the airgap structure adjacent to the top surface of the base layer; and

the perimetric edges of the base layer, the airgap structure and the moisture permeable layer aligned to form an insole perimetric edge.

7. The article of footwear according to claim 6, further including stitching spaced from and parallel to the insole perimetric edge, fastening together the base layer, the airgap layer and the moisture permeable layer.

8. The article of footwear according to claim 6, wherein the airgap structure further includes multiple layers of a mesh material, each layer having crossing strands defining apertures therethrough.

9. The article of footwear according to claim 8 wherein each of the multiple layers of a mesh material is a polypropylene mesh having a thickness of 0.012" and having apertures with a size of 0.014".

10. The article of footwear according to claim 9 wherein the multiple layers of a mesh material include at least three layers.

* * * * *