FOOTWEAR ASSEMBLY WITH BREATHABLE AND WEAR-RESISTANT WOVEN VAMP

A footwear assembly with breathable and wear-resistant woven vamp is disclosed, which includes a sole structure and a breathable and wear-resistant woven vamp. The breathable and wear-resistant woven vamp has a woven fabric with a two-layered structure and is assembled on the sole structure to form the footwear assembly. The breathable and wear-resistant woven vamp is made by a double beam jacquard based on a texture composition and planned pores and a plurality of breathable pores are formed by obliquely interlacing a first warp yarn series, a second warp yarn series and a plurality of weft yarn series.
FOOTWEAR ASSEMBLY WITH BREATHABLE AND WEAR-RESISTANT WOVEN VAMP

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from Taiwan Patent Application No. 103218667, filed on Oct. 21, 2014, in the Taiwan Intellectual Property Office, the content of which is hereby incorporated by reference in their entirety for all purposes.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention discloses a footwear assembly with breathable and wear-resistant woven vamp which applies two warp beam yarn feed rollers of a double beam jacquard to feed the warp yarns made of different materials and having different thread diameters, and the fed yarns are interlaced to form the breathable and wear-resistant woven vamp having diverse internal and external structures, and then the breathable and wear-resistant vamp are assembled with the sole structure to form the footwear assembly.

[0004] 2. Description of the Related Art

[0005] Generally, the conventional footwear assembly includes a sole structure and a woven vamp, and shoes, which aim to diverse purposes, are made of different materials to form the vamp. For example, vamp of sport shoes may be made of the materials characterized of anti-stretchability, wear resistance, comfortability, air permeability, compressibility, moisture absorbing and perspiration dissipation, and so on.

[0006] One piece woven vamp fabric has been widely applied to manufacture the vamp, and the knitting technique is mainly served as the manufacturing method. However, the vamp fabric made of the knitting technique is still of the shortcomings as follows. Firstly, the used yarns are limited to the specification and size, and the vamp's composition is limited thereto as well. Secondly, only a few kinds of yarns or reinforcement procedure can be applied to satisfy with the requirements of the wear-resistant woven vamp and the tensile strength. Thirdly, the knitted fabrics are mostly monochromatic and piece dyed, and the production speed may be slowed down if the polychrome fabrics are applied. Finally, as the knitted fabrics are of flexibility, the follow-up second process is therefore more complicated, resulting that the related cost increases.

[0007] The difference between the knitted fabrics and the woven ones lies in the diverse forms of the yarns in the fabrics. Relative to the knitted fabrics, the woven fabrics are made by obliquely interlacing yarns through warp and weft directions, and the woven vamp made of the woven fabric has the following advantages. Firstly, the woven fabrics have diverse texture compositions and the designed patterns, so that the vamp can thereby be formed more diversely and flexibly. Secondly, as the ideal yarn types can be chose to correspond to the woven fabrics, such that the woven fabrics have better wear resistance, tensile strength, coverage, and so on. Finally, the various yarn types contribute to the choice of the vamp's color.

[0008] The tradition weaving machine, however, only applies single warp beam yarn feed roller to feed the warp yarns which are made of monotype material or have single thread diameter, resulting that the current vamp is only made of single layer structure. If producing the fabrics, which have a two-layered structure and are made of different materials, is desired, weaving the two-layered structure or performing a second manufacturing process to the single layer structure is necessary. Such manufacturing process is time-consuming and incapable of being controlled precisely.

[0009] In view of the aforementioned description, the inventor of the present invention has been mulling it over and therefore designs a footwear assembly with breathable and wear-resistant woven vamp which aims to improve the shortcomings of the current technique so as to increase the industrial practicability.

SUMMARY OF THE INVENTION

[0010] In view of the aforementioned technical problems, the objective of the present invention provides a footwear assembly with breathable and wear-resistant woven vamp of which the vamp is made by the woven technique. In addition, a double beam jacquard is applied to respectively feed and then interlace a first warp yarn series and a second warp yarn series having different yarn types or thread diameters to form the functional woven vamp. As a result, such integrated woven technique is able to shorten the production time and reduce the production cost by simplifying the process of combining the traditional vamp piecedwise.

[0011] In view of the aforementioned technical problems, the objective of the present invention provides a footwear assembly with breathable and wear-resistant woven vamp which is made by obliquely interlacing a first warp yarn series, a second warp yarn series and a plurality of weft yarn series to improve the conventional woven technique that is limited to the warp and weft directions. Besides, the present invention is able to overcome the shortcomings of the fabric having diverse sizes, three-dimensional touch, and internal and external structures which cannot be made in the signal manufacturing process.

[0012] In view of the aforementioned technical problems, the objective of the present invention provides a footwear assembly with breathable and wear-resistant woven vamp which applies a plurality of triangle heddle members to associate with a jacquard to lift or shift the first warp yarn series and the second warp yarn series correspondingly according to the planned pores. Besides, the present invention also associates with a plurality of weft yarn series to obliquely interlace to form a plurality of breathable pores, such that the breathable and wear-resistant woven vamp of the present invention is of better air permeability than the traditional one.

[0013] According to the foregoing objectives, the present invention provides a footwear assembly with breathable and wear-resistant woven vamp which may include a sole structure and a breathable and wear-resistant woven vamp. The breathable and wear-resistant woven vamp may have a two-layered structure and may be assembled on the sole structure to form the footwear assembly. The breathable and wear-resistant woven vamp may be made by a double beam jacquard based on a texture composition and planned pores, and a plurality of breathable pores may be formed by obliquely interlacing a first warp yarn series, a second warp yarn series and a plurality of weft yarn series.

[0014] Preferably, the double beam jacquard may include two warp beam yarn feed rollers, a jacquard, a plurality of triangle heddle members and a plurality of weft yarn feed mechanisms.
Preferably, the plurality of triangle heddle members may associate with the Jacquard to lift or shift the first warp yarn series and the second warp yarn series correspondingly according to the planned pores.

Preferably, the double beam Jacquard may provide yarns of the first warp yarn series or the second warp yarn series with different thread diameters to promote the wear resistance of the breathable and wear-resistant woven vamp. Preferably, the two-layered structure may be the same or different structure.

Preferably, a yarn type of the first warp yarn series, the second warp yarn series and the plurality of weft yarn series may include an elastic fiber yarn, a twist yarn or a combination thereof.

Preferably, when the yarn type is the elastic fiber yarn, a thread diameter of the first warp yarn series is from 150 denier to 1200 denier; a thread diameter of the second warp yarn series is from 100 denier to 1200 denier; and a thread diameter of the plurality of weft yarn series is from 100 denier to 1200 denier.

Preferably, when the yarn type is the twist yarn, a thread diameter of the first warp yarn series is from 150 denier to 1200 denier; a thread diameter of the second warp yarn series is from 100 denier to 1200 denier; and a thread diameter of the plurality of weft yarn series is from 100 denier to 1200 denier.

The primary objective of the present invention provides a footwear assembly with breathable and wear-resistant woven vamp. The provided breathable and wear-resistant woven vamp may have one or more following advantages.

1. Two-layered structure. By associating with the warp yarn series and the weft yarn series having different thread diameters with the texture composition, the fabric texture having the same or different structure can thereby be made.

2. Three-dimensional composition. By interlacing the warp yarn series and the weft yarn series made of different materials and having different thread diameters, the vamp can be made with different sizes and three-dimensional touch. In addition, the yarns having thinner thread diameter can be applied to compose diverse and complicated patterns.

3. Better wear resistance. The yarns having different thread diameters can be respectively applied to weave according to the texture composition. For example, the yarns having thicker thread diameter may be applied to provide better wear resistance, such that the wear resistance of the fabric can thereby be promoted.

4. Better air permeability. The first warp yarn series, the second warp yarn series and the plurality of weft yarn series are interlaced according to the texture composition and the planned pores to form the plurality of breathable pores, such that the uncomfortableness of the hot and windless happened in feet can be eased.

5. Better easy-dry character. As the plurality of breathable pores assembled on the sole structure can rapidly ventilate the moisture accumulated in the footwear assembly, the service life thereof can thereby be promoted.

6. Cost reduction. Compared with the conventional knitted vamp, the integrated woven vamp is more suitable to be produced massively. As the result, by means of the breathable and wear-resistant woven vamp provided by the present invention, the shoe factory is capable of producing shoes through simple cutting and manufacturing process, so as to greatly reduce the cost of the production apparatus and the personnel cost, as well as the production time. So, the costs related to the production line, production apparatus, manufacturing process, storage, personnel, factory, and so on all can be reduced greatly, and the cheaper product price of shoe can therefore be reflected to the consumers.

With these and other objects, advantages, and features of the invention that may become hereinafter apparent, the nature of the invention may be more clearly understood by reference to the detailed description of the invention, the embodiments and to the several drawings herein.

BRIEF DESCRIPTION OF THE DRAWINGS

The detailed structure, operating principle and effects of the present invention will now be described in more detail hereinafter with reference to the accompanying drawings that show various embodiments of the invention as follows.

FIG. 1 is a schematic diagram of a breathable and wear-resistant woven vamp according to the present invention.

FIG. 2 is a schematic diagram of a footwear assembly according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, embodiments of the present invention will be described in detail with reference to the accompanying drawings so that those skilled in the art to which the present invention pertains can realize the present invention. As those skilled in the art would realize, the described embodiments may be modified in various different ways, all without departing from the spirit or scope of the present invention.

The exemplary embodiments of the present invention will be understood more fully from the detailed description given below and from the accompanying drawings of various embodiments of the invention, which; however, should not be taken to limit the invention to the specific embodiments, but are for explanation and understanding only.

Please refer to FIG. 1 which is a schematic diagram of a breathable and wear-resistant woven vamp according to the present invention. As shown in FIG. 1, a breathable and wear-resistant woven vamp 20 includes a plurality of breathable pores 62 and a plurality of shoestring holes 63. In practice, the plurality of breathable pores 62 are sized up and distributed according to planned pores adequately, and the embodiment applied in the FIG. is only an example and it shall be not limited thereto.

The breathable and wear-resistant woven vamp 20 is made by a double beam Jacquard according to the desired texture composition, and the patterns such as decoration, imagery totem, logo, and so on can further be added to the texture composition of the vamp. The double beam Jacquard includes two warp beam yarn feed rollers, a Jacquard, a plurality of triangle heddle members and a plurality of weft yarn feed mechanisms.

The double beam Jacquard respectively provides and feeds the first warp yarn series and the second warp yarn series through the two warp beam yarn feed rollers, and associates with the plurality of weft yarn feed mechanisms to feed the plurality of weft yarn series to interface the vamp. In addition, the yarns, which are made of different materials and have different thread diameters, are applied to produce the
woven vamp having different types or colors in single manufacturing process. Namely, the breathable and wear-resistant woven vamp 20 is able to be formed as the same internal and external structure or the different structures according to the actual requirements, so as to effectively reduce the necessary production time and the cost of the follow-up second process.  

Furthermore, applying the yarns having thicker thread diameter is able to effectively promote the wear resistance of the fabric. In practice, the anti-stretchability and wear resistance of the applied yarns can be promoted by means of the reinforcement procedure of twisting yarns or sizing.

The plurality of triangle heddle members associate with the jacquard to lift or shift the first warp yarn series and the second warp yarn series correspondingly according to the planned pores, and associate with the plurality of weft yarn series to interlace to form the plurality of breathable pores 62. Hereby, the vamp has better ventilation effect to ventilate the steam so as to ease the uncomfortableness of the hot and windless happened in feet.

Moreover, the difference of the materials or thread diameters of the first warp yarn series and the second warp yarn series is applied to produce the breathable and wear-resistant woven vamp 20 in the single manufacturing process. Here, a yarn type of the first warp yarn series, the second warp yarn series and the plurality of weft yarn series includes an elastic fiber yarn, a twist yarn or a combination thereof.

When the elastic fiber is applied as the yarn type, the yarns are stretchable and deformable as the elongational elasticity. Hence, adding a torque controller for adequately adjusting the rolling speed of the rollers in the manufacturing process is necessary, such that the vamp pattern can prevent from being deformed and hereby to maintain a better fabric manufacturing rate.

In practice, when the yarn type is the elastic fiber yarn, a thread diameter of the first warp yarn series is from 150 denier to 1200 denier, a thread diameter of the second warp yarn series is from 100 denier to 1200 denier, and a thread diameter of the plurality of weft yarn series is from 100 denier to 1200 denier.

Please refer to FIG. 2 which is a schematic diagram of a footwear assembly according to the present invention. As shown in the FIG., a footwear assembly 61 is provided, which includes the breathable and wear-resistant woven vamp 20 and a sole structure 10. The breathable and wear-resistant woven vamp 20 is assembled on the sole structure 10 through manners such as sewing, jointing, and binding, and so on to form the footwear assembly 61. The breathable and wear-resistant woven vamp 20 has been detailed in FIG. 1, and the unnecessary details are no longer given herein.

After being woven by the double beam jacquard, the breathable and wear-resistant woven vamp 20 is then cut according to the outline of the vamp pattern and assembled with the sole structure 10 to form the footwear assembly 61. In practice, the breathable and wear-resistant woven vamp 20 is cut by die cutting, shearing, or laser cutting.

The breathable and wear-resistant woven vamp disclosed in the present invention is made by a double beam jacquard, and by applying the warp yarn series and weft yarn series having different thread diameters to associate with the texture composition, the fabric having diverse sizes, three-dimensional touch and internal and external structures can be made in the signal manufacturing process. Furthermore, the different functional structures can be achieved according to the actual requirements. For example, the external structure of the vamp is made of the yarns having thicker thread diameter to strengthen the wear resistance, so that the damage to the external structure of the vamp can be avoided owing to the better wear resistance. In the case of the internal structure, the yarns having thinner thread diameter are applied to maintain the pliability because user's foot has a close contact with the internal structure of the vamp.

While the means of specific embodiments in present invention has been described by reference drawings, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims. The modifications and variations should be in a range limited by the specification of the present invention.

What is claimed is:

1. A footwear assembly with breathable and wear-resistant woven vamp, comprising:

   a sole structure; and

   a breathable and wear-resistant woven vamp having a woven fabric with a two-layered structure and assembled on the sole structure to form the footwear assembly, wherein the breathable and wear-resistant woven vamp is made by a double beam jacquard based on a texture composition and planned pores, and a plurality of breathable pores are formed by obliquely interlacing a first warp yarn series, a second warp yarn series and a plurality of weft yarn series.

2. The footwear assembly with breathable and wear-resistant woven vamp of claim 1, wherein the double beam jacquard comprises two warp beam yarn feed rollers, a jacquard, a plurality of triangle heddle members and a plurality of weft yarn feed mechanisms.

3. The footwear assembly with breathable and wear-resistant woven vamp of claim 2, wherein the plurality of triangle heddle members associate with the jacquard to lift or shift the first warp yarn series and the second warp yarn series correspondingly according to the planned pores.

4. The footwear assembly with breathable and wear-resistant woven vamp of claim 1, wherein the double beam jacquard provides yarns of the first warp yarn series or the second warp yarn series with different thread diameters to promote the wear resistance of the breathable and wear-resistant woven vamp.

5. The footwear assembly with breathable and wear-resistant woven vamp of claim 1, wherein the two-layered structure is the same or different structure.

6. The footwear assembly with breathable and wear-resistant woven vamp of claim 1, wherein a yarn type of the first warp yarn series, the second warp yarn series and the plurality of weft yarn series comprises an elastic fiber yarn, a twist yarn or a combination thereof.

7. The footwear assembly with breathable and wear-resistant woven vamp of claim 6, wherein when the yarn type is an elastic fiber yarn, a thread diameter of the first warp yarn series is from 150 denier to 1200 denier, a thread diameter of the second warp yarn series is from 100 denier to 1200 denier,
and a thread diameter of the plurality of weft yarn series is from 100 denier to 1200 denier.

8. The footwear assembly with breathable and wear-resistant woven vamp of claim 6, wherein when the yarn type is the twist yarn, a thread diameter of the first warp yarn series is from 150 denier to 1200 denier, a thread diameter of the second warp yarn series is from 100 denier to 1200 denier, and a thread diameter of the plurality of weft yarn series is from 100 denier to 1200 denier.

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