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(54) **WOOL PILE FABRIC INCLUDING SECURITY FIBERS AND METHOD OF MANUFACTURING SAME**

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(57) **ABSTRACT**

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A wool pile fabric product including a plurality of wool fibers and at least one security fiber knit with a textile scrim to form a pile fabric having a scrim side and a fiber pile side. The product also includes a facing material that is attached to the scrim side of the wool pile fabric. The security fiber in the product provides a discrete way to identify a genuine product.

**Related U.S. Application Data**

(60) Provisional application No. 61/618,470, filed on Mar. 30, 2012, provisional application No. 61/651,922,

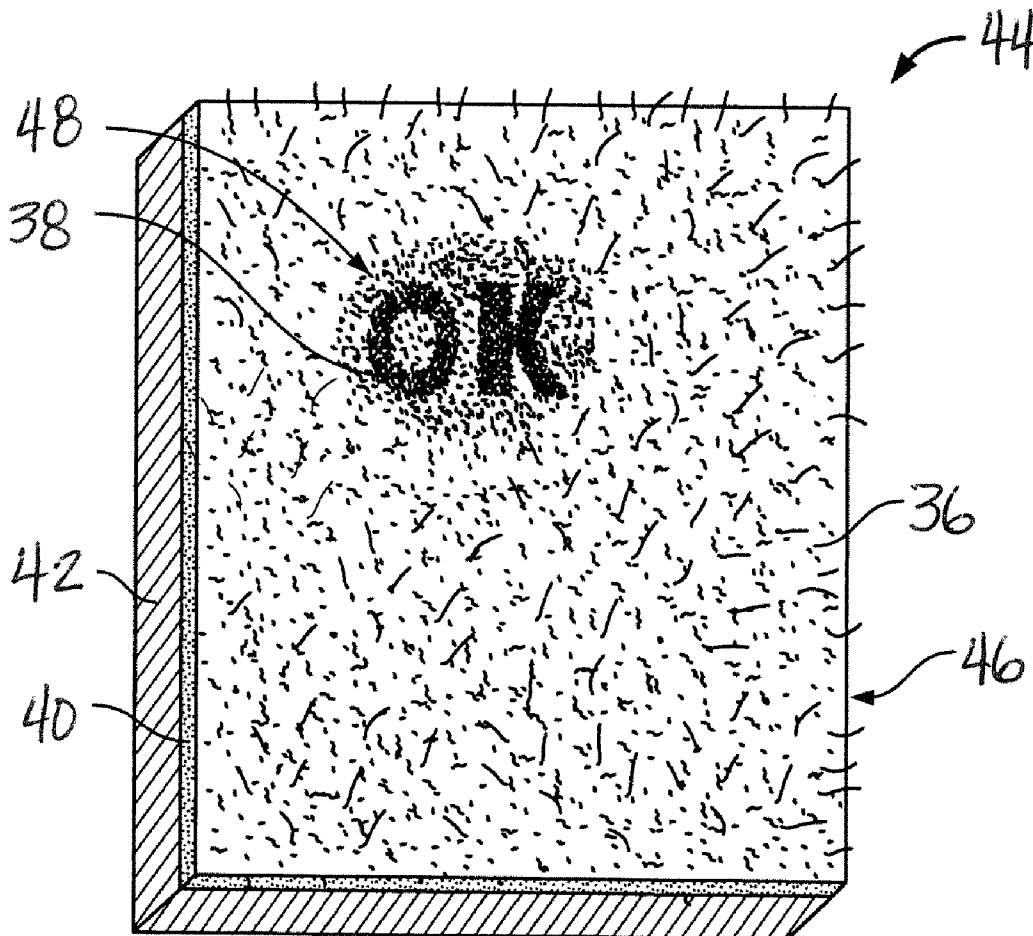


FIG. 1

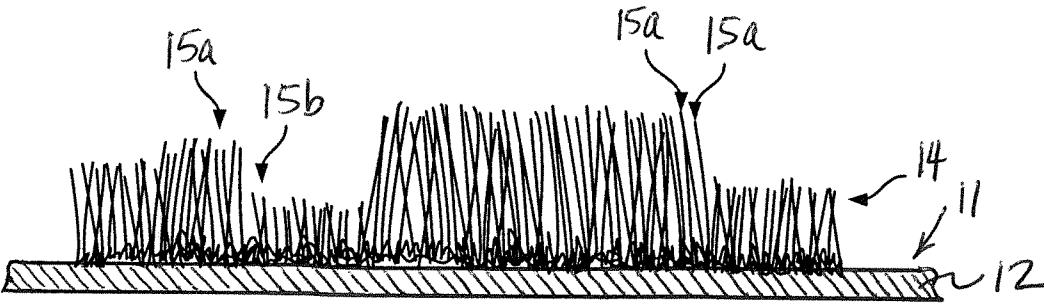


FIG. 2

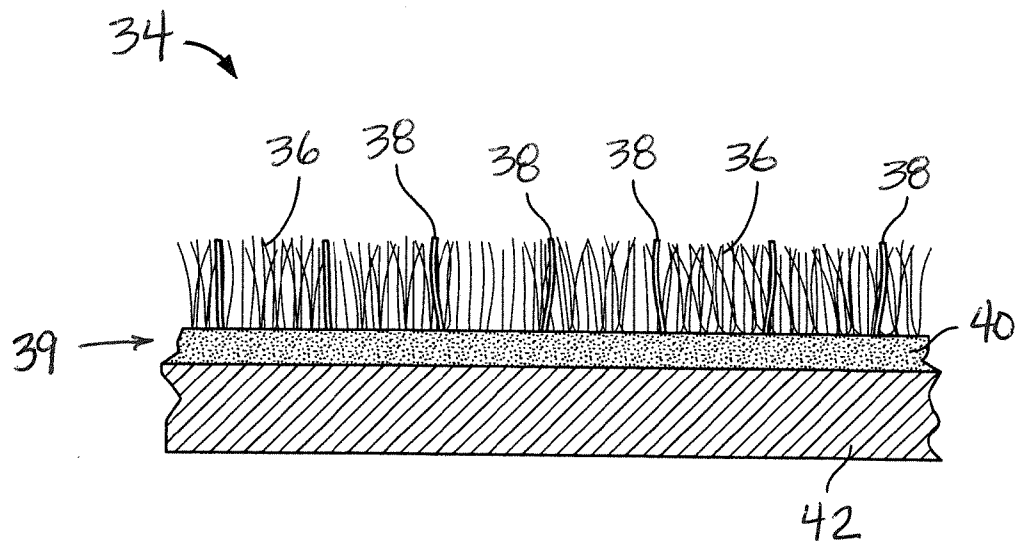
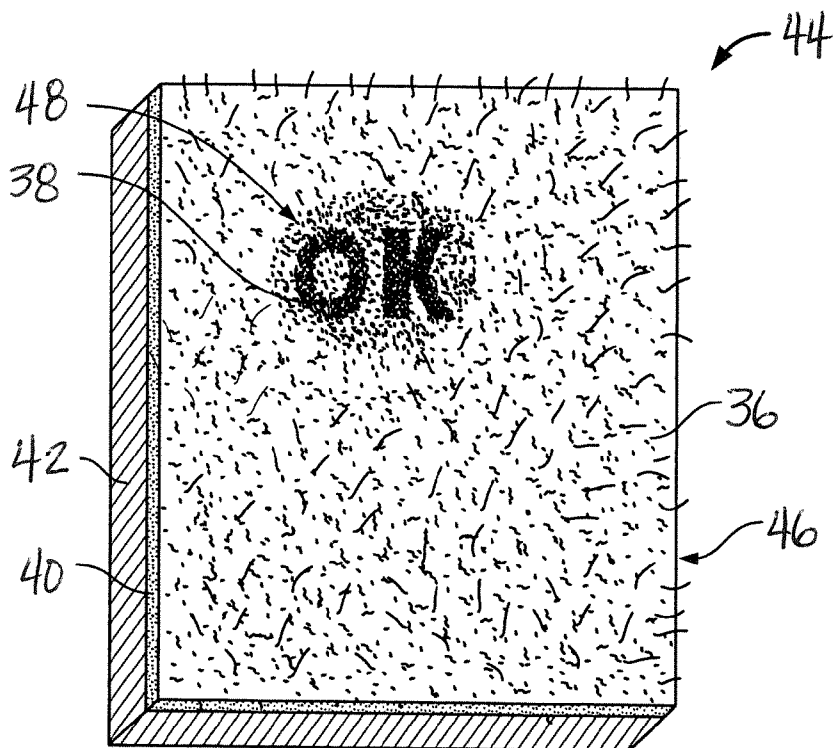


FIG. 3



**WOOL PILE FABRIC INCLUDING SECURITY FIBERS AND METHOD OF MANUFACTURING SAME**

**PRIORITY CLAIM**

[0001] The present non-provisional application claims priority to and the benefit of U.S. Provisional Application No. 61/618,470 filed on Mar. 30, 2012, U.S. Provisional Application No. 61/651,922 filed on May 25, 2012, U.S. Provisional Application No. 61/680,608 filed on Aug. 7, 2012 and U.S. Provisional Application No. 61/722,994 filed on Nov. 6, 2012, each of which are hereby incorporated by reference in their entireties.

**BACKGROUND**

[0002] Counterfeiting of genuine products is a significant problem facing many product manufacturers, especially footwear manufacturers. Footwear accounts for over 40% of the counterfeit products seized by the U.S. government and it is estimated that the footwear industry loses over \$10 billion dollars annually due to counterfeit footwear products.

[0003] Footwear manufacturers employ a variety of security devices and methods to identify whether a product is a genuine product, i.e., made by the product manufacturer, or a fake or counterfeit product. Some of the security devices are readily apparent such as the quality and look of the product, the manufacturing quality of the product or the information on a label. Other devices are hidden or unknown to counterfeiters such as discrete markings or codes placed in designated locations on the product. Over time, however, counterfeiters find the security devices and replicate them in their counterfeit products.

[0004] Accordingly, there is a need for new and improved security devices for identifying genuine products.

**BRIEF SUMMARY**

[0005] The present invention relates to a wool pile fabric and a method of manufacturing a wool pile fabric including security fibers that provides an effective and low cost indicia of authenticity.

[0006] In one embodiment, a wool pile fabric product is provided that includes a plurality of wool fibers and at least one security fiber knit with a textile scrim. The resulting pile fabric has a scrim side and a fiber pile side. The product can also include a facing material that is attached to the scrim side of the wool pile fabric.

[0007] In another embodiment, a method of manufacturing a product includes is provided that includes providing a knitting machine, feeding a sliver of fibers to the knitting machine, where the sliver is comprised of wool fibers and at least one security fiber and simultaneously knitting the fibers and a scrim yarn to form a pile fabric having a scrim side and a fiber pile side with the at least one security fiber.

[0008] In a further embodiment, a method of manufacturing a product is provided and includes providing a knitting machine, mixing wool fibers and security fibers, feeding a sliver of the mixed fibers to the knitting machine and simultaneously knitting the mixed fibers and a scrim yarn to form a pile fabric having a scrim side and a fiber pile side having the security fibers.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0009] FIG. 1 is a front elevational view of the wool pile fabric including wool fibers having different lengths and densities;

[0010] FIG. 2 is a fragmentary cross-section view of an embodiment of the present wool pile fabric product including security fibers.

[0011] FIG. 3 is fragmentary perspective view of another embodiment of the present wool pile fabric product including security fibers forming a identifying symbol.

**DETAILED DESCRIPTION**

[0012] Various embodiments of the invention are described below by way of example only, with reference to the accompanying drawings. The drawings include figures that may not be to scale, which will be fully understood by skilled artisans with reference to the accompanying description. Features may be exaggerated for purposes of illustration. From the preferred embodiments, artisans will recognize additional features and broader aspects of the invention.

[0013] The present disclosure provides a method of manufacturing footwear or other products from a predominantly wool pile fabric. The pile fabric is preferably formed as described in commonly owned U.S. patent application Ser. No. 13/838,551, filed March 15, 2013 and entitled "Natural Wool Pile Fabric and Method for Making Wool Pile Fabric," which application is hereby incorporated by reference in its entirety. The method of the present disclosure significantly improves the identification of genuine products.

[0014] Referring now to FIGS. 1-3, in an embodiment of the present product and method, sheared wool is processed, i.e., cleaned, carded, slivered, and knitted, woven or otherwise secured to a base material 11 such as a textile scrim 12 to make a wool pile fabric product. The scrim 12 may be any suitable material or combination of materials such as a natural or synthetic fiber yarn. In a preferred embodiment sheared wool fibers 14, alone or mixed with other non-wool fibers, are simultaneously knit with scrim yarn using a conventional tubular or circular knitting machine. Other knitting, weaving or non-woven textile process can be used in lieu of tubular knitting. The sheared wool fibers 14 may include fibers having different lengths, i.e., longer fibers 15a and shorter fibers 15b, and densities, e.g., including fibers having different lengths or heights. Also, the number of fibers in a particular area or areas on the base material 12, i.e., the fiber density, may be uniform or may vary along a length, a width or in any suitable pattern on the base material.

[0015] Non-wool fibers, such as natural or synthetic fibers for controlling odor, or security fibers as described below, can be combined with the wool fibers. Such non-wool fibers may be mixed with the wool fibers prior to knitting, i.e., a fiber sliver fed to the knitting machine may comprise a mixture of fiber types. Alternatively, a plurality of slivers can be fed to the knitting machine each sliver containing a different fiber type or a different mix of fibers, and the knitting machine can be programmed to knit different, predetermined areas with different fibers or different fiber mixes.

[0016] In one embodiment of the invention, wool fibers are mixed or otherwise combined with security fibers and formed into a sliver. The combined fiber sliver is fed to a knitting machine for simultaneously knitting wool both wool and security fibers with a yarn. Alternatively, security fibers can be fed to the knitting machine separately from the wool fiber

sliver. Then the security fibers can be knitted into the wool pile fabric. Finally, the security fibers may be in yarn form and separately fed into the knitting machine from a spool. It should be appreciated that one or a plurality of security fibers may be combined with the wool fibers or knit with the scrim in multiple ways.

[0017] FIG. 2 shows an embodiment of the wool pile fabric product 34, such as a footwear insole or liner, where the component includes sheared wool fibers 36 and one or more security fibers 38 knit with an inner backing material 39, such as a textile scrim 40. The security fibers 38 may be fibers having a different size, shape or color, or fibers that are made of a luminescent material that illuminates to distinguish the security fibers from the sheared wool fibers using an independent identifying device such as an ultraviolet light source, i.e., a blacklight, or other suitable device.

[0018] Optionally, the scrim 40 is attached to a suitable outer backing material or facing material 42 by a lamination process, a gluing process, sewing or other suitable attachment process to produce the finished sheared wool product. It should be appreciated that the facing material may be any suitable material, including but not limited to, ethylene vinyl acetate (EVA), leather, suede, fabric, synthetic leather, synthetic suede or other suitable natural or synthetic material or combination of these materials.

[0019] FIG. 3 shows another embodiment of the wool pile fabric product 44 including the security fibers discussed above. Specifically, the wool pile fabric product 44 includes a sheared wool fiber layer 46 woven to an inner backing material layer or scrim 40, which in turn, is attached to an outer material backing layer or facing material 42 as described above. The sheared wool fiber layer 46 includes a plurality of sheared wool fibers 36 and a plurality of security fibers 38 that are woven to the backing material 40 so that the security fibers form a pattern, symbol or design 48, such as the word "OK," that is not visible or noticeable to the naked eye but is visible using an identifying device such as a blacklight or special lens. It should be appreciated that the pattern or design may be a shape, a number, a combination of shapes and numbers or any suitable design or combination of designs. In another embodiment, the security fibers 38 are intermixed with the sheared wool fibers and are visible using a suitable identifying device because the fibers glow or are a different color upon illumination or using another identifying method. Thus, the security fibers 38 can be used to identify genuine or original product and/or distinguish it from fake or counterfeit products.

[0020] The wool pile fabric described in the above embodiments helps to identify genuine products and reduce losses due to counterfeiting. It is contemplated that the security fibers described above may be used in the wool pile fabric or in other products including the wool pile fabric such as apparel, car seat covers and rugs.

[0021] While particular embodiments of the wool pile fabric have been described herein, it will be appreciated by those

skilled in the art that changes and modifications may be made thereto without departing from the invention in its broader aspects.

What is claimed is:

- 1. A method of manufacturing a product, comprising: providing a knitting machine; feeding a sliver of fibers to the knitting machine, the sliver being comprised of wool fibers and at least one security fiber; and simultaneously knitting the fibers and a scrim yarn to form a pile fabric having a scrim side and a fiber pile side with the at least one security fiber.
- 2. The method of claim 1, further comprising feeding a plurality of security fibers to the knitting machine independently from the sliver of wool fibers.
- 3. The method of claim 1, wherein the at least one security fiber is made of a luminescent material.
- 4. The method of claim 1, wherein the knitting of the fibers includes knitting a plurality of the wool fibers and the security fibers with the scrim yarn to form a pile fabric.
- 5. The method of claim 4, wherein the security fibers are knit in the form of a symbol on the scrim.
- 6. The method of claim 4, wherein the security fibers are knit in the form of a pattern on the scrim.
- 7. A method of manufacturing a product, comprising: providing a knitting machine; mixing wool fibers and security fibers; forming a sliver of combined wool and security fibers; feeding the sliver of the mixed fibers to the knitting machine; and simultaneously knitting the mixed fibers and a scrim yarn to form a pile fabric having a scrim side and a fiber pile side having the security fibers.
- 8. The method of claim 7, wherein the at least one of the security fibers is made of a luminescent material.
- 9. The method of claim 7, wherein the mixed fibers are knit in the form of a symbol on the scrim.
- 10. The method of claim 7, wherein the mixed fibers are knit in the form of a pattern or symbol within the fiber pile.
- 11. A wool pile fabric product comprising: a plurality of wool fibers and at least one security fiber knit with a textile scrim to form a pile fabric having a scrim side and a fiber pile side; and a facing material attached to the scrim side of the wool pile fabric.
- 12. The wool pile fabric product of claim 11, wherein the at least one security fiber is made of a luminescent material.
- 13. The wool pile fabric product of claim 11, further comprising a plurality of security fibers knit with the scrim.
- 14. The wool pile fabric of claim 13, wherein the plurality of security fibers form a pattern on the scrim.
- 15. The wool pile fabric of claim 14, wherein the facing material includes one of ethylene vinyl acetate (EVA), leather, suede, fabric, synthetic leather, synthetic suede or other suitable natural or synthetic material or combination of these materials.

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