



US 20060070681A1

(19) **United States**

(12) **Patent Application Publication**
Haroutoonian et al.

(10) **Pub. No.: US 2006/0070681 A1**

(43) **Pub. Date: Apr. 6, 2006**

(54) **WOVEN LABEL**

Publication Classification

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(51) **Int. Cl.**
D03D 23/00 (2006.01)

(52) **U.S. Cl.** **139/383 R**

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(57) **ABSTRACT**

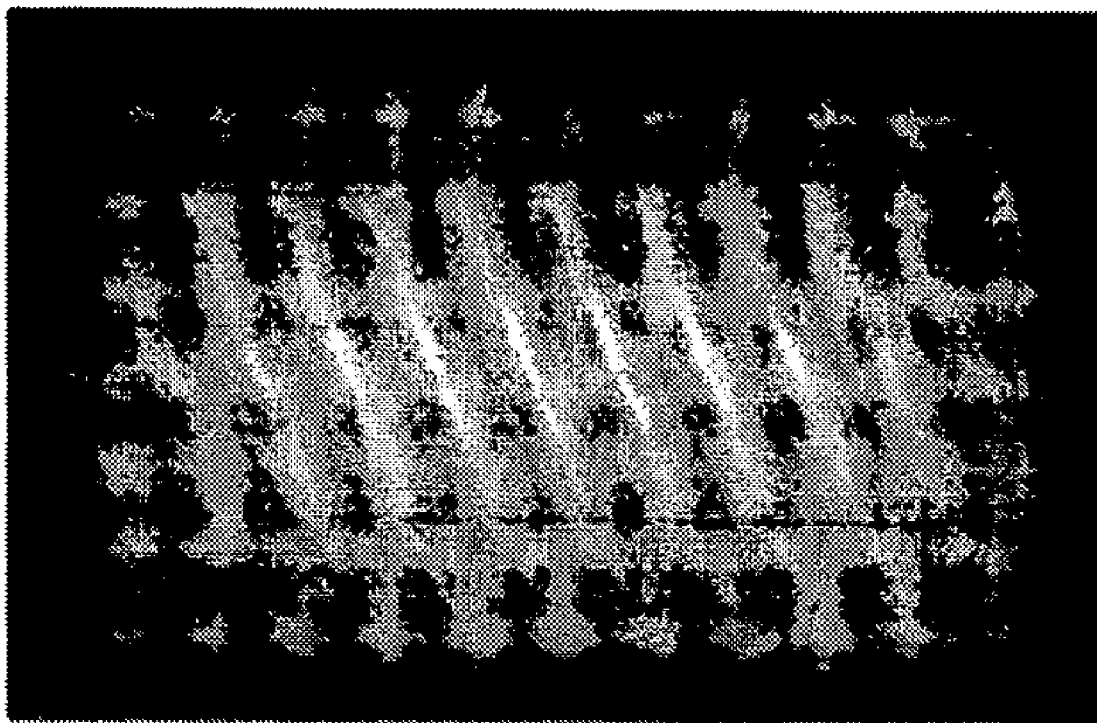
(21) Appl. No.: **11/236,114**

(22) Filed: **Sep. 26, 2005**

Related U.S. Application Data

(60) Provisional application No. 60/612,971, filed on Sep. 24, 2004.

A high density woven label includes a finer grade yarn spun from specially selected polyester fabrics. The yarn has a thickness of less than 75 denier. The label comprises differently colored yarn that is woven together to form a graphic, logo or trademark. The woven label is particularly useful as a clothing tag. The woven label has a density of more than 80 picks per centimeter. A preferred method of manufacturing is also provided which includes weaving the yarn at a slower than normal weaving rate.



PRIOR ART

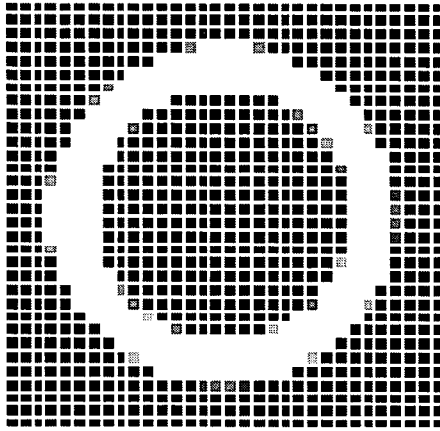


FIG. 1

PRIOR ART

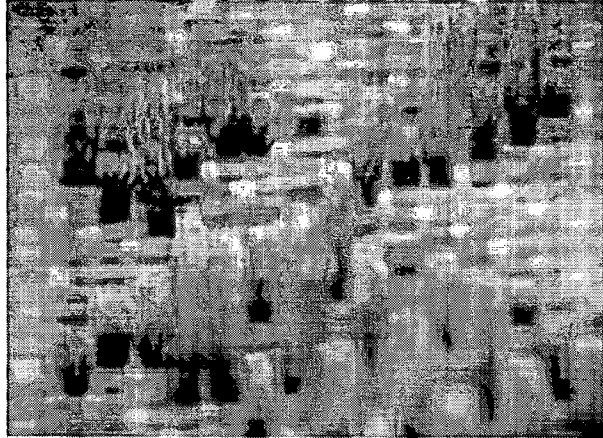


FIG. 2

PRIOR ART

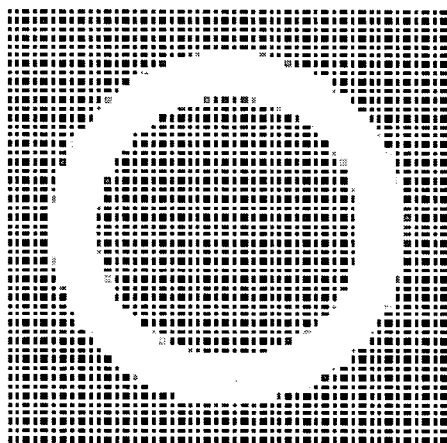


FIG. 3

PRIOR ART

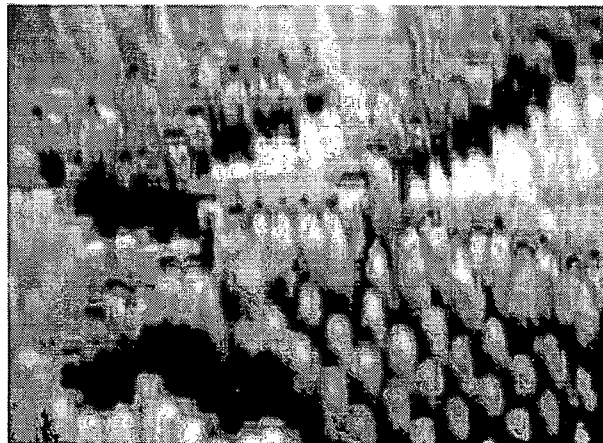


FIG. 4

PRIOR ART



FIG. 5

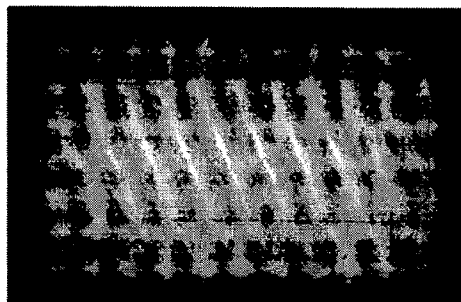


FIG. 6

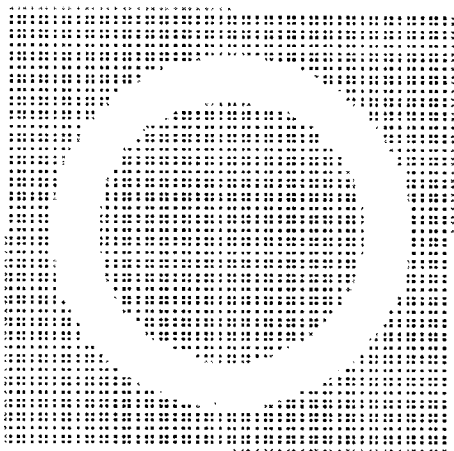


FIG. 7



FIG. 8

100

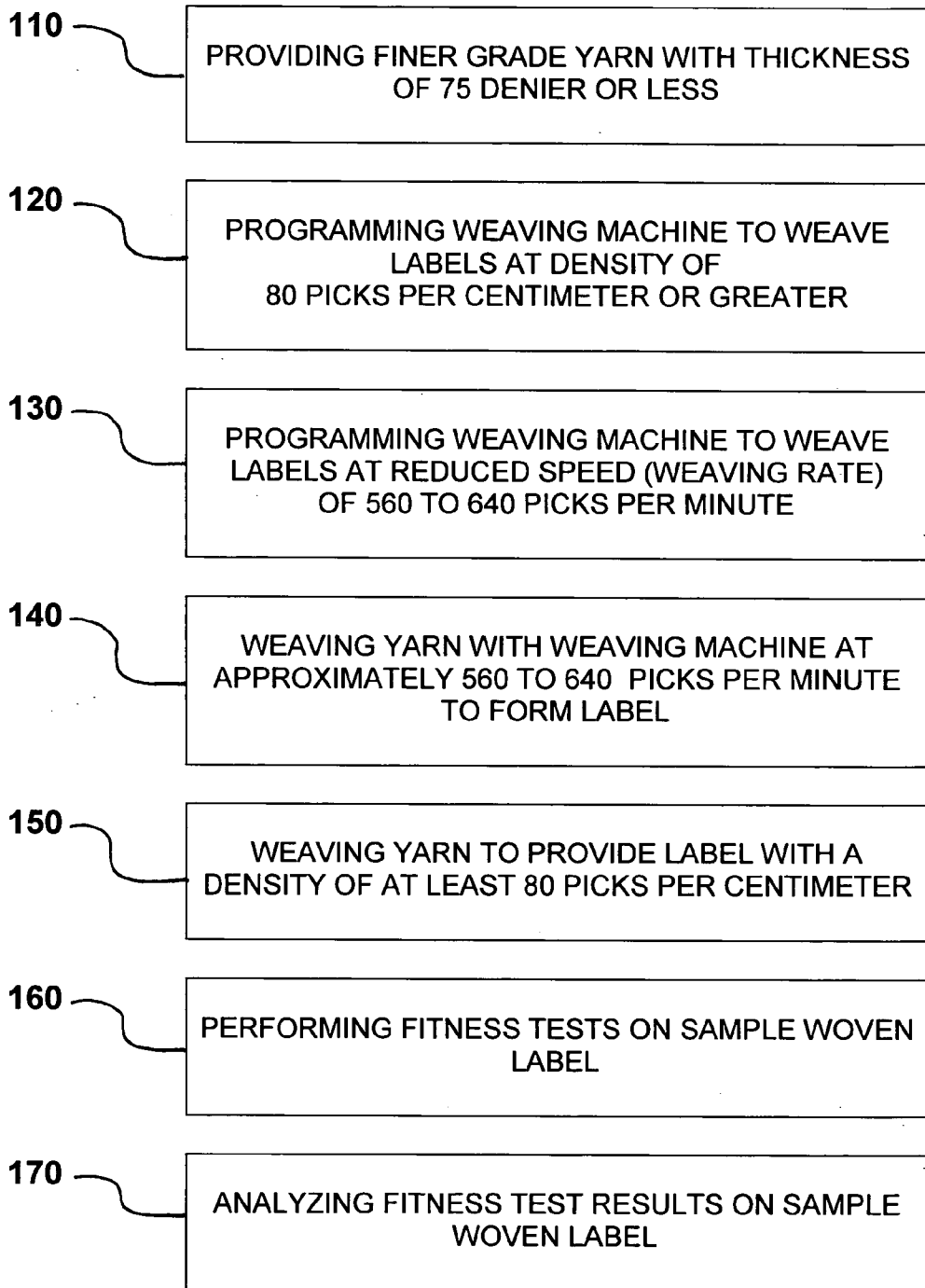


FIG. 9

WOVEN LABEL

RELATED APPLICATIONS

[0001] This application relates to, claims priority from, and incorporates herein by reference, as if fully set forth, U.S. Provisional Patent Application Ser. No. 60/612,971 filed on Sep. 24, 2004 and entitled "HIGH DENSITY MICRO DENIER".

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The invention relates generally to woven fabrics and methods, and more particularly to woven labels.

[0004] 2. Description of Prior Art and Related Information

[0005] Fabric labels or tags are typically affixed to merchandise to indicate the source. Labels may also provide information, such as instructions for care and maintenance of the product. Clothing labels, in particular, often bear trademarks and logos with a high level of detail and color. The need to provide such detail must be balanced by the need for softness as such tags are affixed to clothing items, for example, which are meant to be worn.

[0006] One conventional approach to creating a clothing label with a high degree of detail is to use printed labels where a printing machine prints waterproof ink on a generally white label. Printed labels have two main drawbacks. First, the ink will eventually wear off as a result of being rubbed or washed, thereby rendering the label useless. When a graphic or logo on a printed label wears off, it gives the impression that the product to which the label is affixed is cheap and lacking in quality. Second, the printed cloth may lack softness and thus end up stiff, which presents a discomfort to the one wearing the item of clothing. Partially peeled ink can scratch the skin of the wearer of the article of clothing.

[0007] Woven labels have colored yarn that is woven into a pattern in order to bear a specific logo or graphic. Very thin yarn is generally referred to as thread. Yarn is manufactured by either a spinning or air texturizing process. Though woven labels do not suffer from the drawback of having ink wearing off, woven labels tend to be limited in density. The limitations in density derive at least in part from the thickness of the yarn which is measured in denier. The limitations in density in turn limit the depth, or clarity, of the graphic on the label. Just as a high resolution monitor can provide more detail and clarity than a low resolution monitor, a lesser dense label would be limited in the amount of detail it can provide in bearing a graphic, logo, trademark or any other image. Accordingly, manufacturers are limited in what types of logos and/or trademarks are available for incorporating into a label. Furthermore, conventional woven labels also lack softness which can present discomfort to the wearer.

[0008] FIGS. 1-5 illustrate woven labels according to the prior art. In FIG. 1, the density of a commonly known fabric called "Taffeta" is illustrated. The density of Taffeta labels generally range from 29 to 32 picks per centimeter. FIG. 2 is a close-up photographic view of an actual Taffeta label according to the prior art bearing the image of a moose head.

[0009] Another commonly known yarn is "Damask" yarn. FIG. 3 illustrates the density of a prior art Damask yarn

which generally ranges from 48 to 54 picks per centimeter. FIG. 4 is a close-up photographic view of a Damask label according to the prior art bearing the same moose head graphic as shown in the Taffeta label of FIG. 2. FIG. 5 is a magnified photographic view of the twist of an actual Damask thread according to the prior art.

SUMMARY OF THE INVENTION

[0010] In accordance with the present invention, structures and associated methods are disclosed which address these needs and overcome the deficiencies of the prior art.

[0011] In one aspect, a woven label is provided. The label comprises a first yarn having a first color and a first thickness less than 75 denier, a second yarn having a second color and a second thickness less than 75 denier, and a density of at least 80 picks per centimeter. The thicknesses of the first and second yarns are preferably between 50 denier and 75 denier. The density preferably comprises a range between 90 to 100 picks per centimeter.

[0012] In another aspect, a high density microdenier woven label is provided using a slower weaving process. The label comprises at least one yarn having a thickness less than 75 denier and a density of at least 80 picks per centimeter. The density is provided by a weaving machine weaving at a rate between 560 to 640 picks per minute. The thickness of the yarn is preferably between 50 denier and 75 denier. The density preferably comprises a range between 90 to 100 picks per centimeter.

[0013] A method of manufacturing a woven label is also provided. The method comprises the steps of providing a yarn with a thickness of 75 denier or less, weaving the yarn at a speed less than 700 picks per minute, and forming the label with a density of at least 80 picks per centimeter. The step of weaving the yarn at the speed less than 700 picks per minute comprises the step of weaving the yarn at the speed between 560 to 640 picks per minute. The step of forming the label with the density of at least 80 picks per centimeter comprises the step of forming the label with the density of 90 to 100 picks per centimeter. The method further comprises the step of programming a weaving machine to weave at the density between 90 to 100 picks per centimeter. The method also comprises programming the weaving machine to weave at the rate of 560 to 640 picks per minute. The invention also includes a label obtained by this preferred method of manufacturing.

[0014] In summary, a high density woven label includes a finer grade yarn spun from specially selected polyester fabrics. The yarn has a thickness of less than 75 denier. The label comprises differently colored yarn that is woven together to form a graphic, logo or trademark. The woven label is particularly useful as a clothing tag. The woven label has a density of more than 80 picks per centimeter. A preferred method of manufacturing is also provided which includes weaving the yarn at a slower than normal weaving rate.

[0015] The invention, now having been briefly summarized, may be better visualized by turning to the following drawings wherein like elements are referenced by like numerals.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a magnified photographic view of the density of a prior art Taffeta woven label:

[0017] FIG. 2 is a close-up photographic view of an actual woven label composed of prior art Taffeta yarn;

[0018] FIG. 3 is a magnified photographic view of the density of a prior art Damask woven label:

[0019] FIG. 4 close-up photographic view of an actual woven label composed of prior art Damask yarn;

[0020] FIG. 5 is a magnified photographic view of a prior art Damask yarn;

[0021] FIG. 6 is a magnified photographic view of a preferred yarn according to the invention;

[0022] FIG. 7 is a magnified photographic view of the density of a preferred woven label according to the invention;

[0023] FIG. 8 is a close-up photographic view of an actual woven label according to the invention; and

[0024] FIG. 9 is a block diagram of a preferred method of manufacturing a woven label according to the invention.

[0025] The invention and its various embodiments can now be better understood by turning to the following detailed description wherein illustrated embodiments are described. It is to be expressly understood that the illustrated embodiments are set forth as examples and not by way of limitations on the invention as ultimately defined in the claims.

DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENTS AND BEST
MODE OF INVENTION

[0026] A first preferred embodiment of a woven label is illustrated in FIGS. 7 and 8 and designated generally by the reference numeral 10. The label 10 preferably comprises a clothing label adapted to be affixed to articles of clothing and thus worn. Nonetheless, the label 10 according to the invention may be used on a variety of articles where woven labels are utilized, such as linens, pillows, furniture, bedding, and other such products.

[0027] The label 10 comprises differently colored yarns, or threads, 20 woven according to a preferred method of manufacturing discussed herein. Each yarn 20 is preferably composed of one or more selected polyester fabrics. In the preferred embodiment, the label 10 comprises finer grade yarns known as microdenier yarns that have a thickness of 80 denier or less. The microdenier yarn 20 preferably has a thickness in the range of 50 to 75 denier. Whereas conventional "damask" thread has a thickness of 75 to 100 denier, the yarns according to the invention each have a thickness of 50 to 75 denier without compromising strength.

[0028] FIG. 6 is a magnified photographic view showing the tighter twist of the preferred yarn 20 according to the invention. Compared with the twist of a prior art damask yarn as shown in FIG. 5, the tighter twist of the yarn 20 according to the invention is noticeably greater in FIG. 6. This tighter twist of the preferred yarn provides the yarn with greater tensile strength.

[0029] The finer grade yarn 20 not only provides greater strength, but also enables a more densely woven label to be produced. In accordance with a preferred method of manufacturing woven labels according to the invention, a stan-

dard weaving machine is programmed to weave the label 10 at a greater density than that of the conventional label. In particular, the weaving machine is programmed to provide a density of at least 80 picks per centimeter, and preferably in the range of 90 to 100 picks per centimeter.

[0030] Furthermore, the weaving machine is programmed such that the weaving process is reduced from the normal rate of 700 to 750 picks per minute to approximately 630 picks per minute, with the preferred range being between 560 picks per minute on the slower end to 640 picks per minute on the relatively quicker end. It will be appreciated that such a step of slowing down the weaving rate would not be obvious to one of ordinary skill in the art since the general trend in art of weaving is to quicken the weaving rate in order to produce more product in a set period of time. To provide the unique, higher quality label 10 according to the invention, output per amount of time might need to be reduced due to the reduced weaving speed.

[0031] Through the combination of a thinner, finer grade yarn, a weaving machine programmed to provide a higher density label, and a slower weaving process, a higher density label 10 according to the invention is accomplished.

[0032] As a result, the label 10 according to the invention has a density of at least 80 picks per centimeter, with a preferred range between 90 to 100 picks per centimeter. FIG. 7 illustrates the density of the label 10 which is preferably in the range between 90 to 100 picks per centimeter. Though it is possible to create a label according to the invention with an even higher density, it was determined that labels with a density higher than 100 picks per centimeter were comprised in flexibility and extension characteristics, thereby leading to higher probability of breakage.

[0033] In FIG. 8, the end result of an actual woven label 10 according to the invention is noticeably clearer. Compared to the prior art labels shown in FIGS. 2 and 4, the label 10 according to the invention in FIG. 8 provides a remarkably greater depth and clarity in the image of the moose head. It will be appreciated that the woven label according to the invention now enables manufacturers, particularly clothiers, to incorporate more detailed logos and trademarks into the labels. And, since the label is woven and not printed, the graphic will not wear off despite repeated wearing and washing. It will further be appreciated that a more detailed graphic on a label that does not wear off will ultimately provide consumers with the impression of a higher quality product.

[0034] Furthermore, by selecting the appropriate fabrics, the softness and durability of the label 10 is maintained without compromising strength. In fact, woven labels 10 according to the invention have been tested in accordance with commonly known procedures in the industry. In particular, an extension test was performed with a STM 468 repeated extension machine, using the SATRA PM103 test method. For the flexibility test, a STM 117 flex and stretch machine was utilized with a test method of SATRA PM147. For the tensile test, an STM 466 tensile testing center was used to measure tensile breakage strength, using the test method of SATRA PM35.

[0035] A preferred method 100 of manufacturing a woven label is illustrated in FIG. 9. The method 100 comprises the step 110 of providing finer grade microdenier yarn having a

thickness of 75 denier or less, and preferably in the range of 50 to 75 denier. This step involves selecting and mixing polyester fibers to produce the yarn.

[0036] In step 120, a standard weaving machine is programmed to provide a label with a density greater than that of conventional labels, namely, a density greater than 80 picks per centimeter, and preferably in the range of 80 to 100 picks per centimeter. In step 130, the weaving machine is programmed to weave labels at a slower rate than the known conventional rate of 700 picks or more per minute. In particular, the weaving machine is programmed to weave in the range of 560 to 640 picks per minute, and preferably at or about 630 picks per minute.

[0037] In step 140, yarn is woven by the weaving machine at the slower rate, namely, between 560 to 640 picks per minute, in order to achieve the unique density as described above. Not only is the yarn woven at a slower rate, it is also woven at a greater density in step 150. Step 150 comprises weaving the yarn to provide a label with a density of at least 80 picks per centimeter, and preferably in the range of 90 to 100 picks per centimeter.

[0038] It will be appreciated that the thinness of the yarn, higher density weaving and slower rate of weaving enables the label to reach the desired density without compromising strength or softness. To ensure the quality of the label, fitness tests are performed on the sample woven label in step 160. These fitness tests may include the extension, flexibility and tensile tests discussed above. It should be understood that the preferred method 100 may include forming a plurality of woven labels which might not pass the fitness tests performed in step 160. Accordingly, step 170 also comprises analyzing the fitness test on the label to determine if the label is of sufficient quality to sold. Step 170 may also include the step of discarding any labels which do not pass the fitness tests.

[0039] Many alterations and modifications may be made by those having ordinary skill in the art without departing from the spirit and scope of the invention. Therefore, it must be understood that the illustrated embodiments have been set forth only for the purposes of examples and that they should not be taken as limiting the invention as defined by the following claims. For example, notwithstanding the fact that the elements of a claim are set forth below in a certain combination, it must be expressly understood that the invention includes other combinations of fewer, more or different ones of the disclosed elements.

[0040] The words used in this specification to describe the invention and its various embodiments are to be understood not only in the sense of their commonly defined meanings, but to include by special definition in this specification the generic structure, material or acts of which they represent a single species.

[0041] The definitions of the words or elements of the following claims are, therefore, defined in this specification to not only include the combination of elements which are literally set forth. In this sense it is therefore contemplated that an equivalent substitution of two or more elements may be made for any one of the elements in the claims below or that a single element may be substituted for two or more elements in a claim. Although elements may be described above as acting in certain combinations and even initially claimed as such, it is to be expressly understood that one or more elements from a claimed combination can in some cases be excised from the combination and that the claimed combination may be directed to a subcombination or variation of a subcombination.

[0042] Insubstantial changes from the claimed subject matter as viewed by a person with ordinary skill in the art, now known or later devised, are expressly contemplated as being equivalently within the scope of the claims. Therefore, obvious substitutions now or later known to one with ordinary skill in the art are defined to be within the scope of the defined elements.

[0043] The claims are thus to be understood to include what is specifically illustrated and described above, what is conceptually equivalent, what can be obviously substituted and also what incorporates the essential idea of the invention.

What is claimed is:

- 1. A high density microdenier woven label, comprising:
 - a yarn having a thickness less than 75 denier; and
 - a density of at least 80 picks per centimeter,

wherein the density is provided by a weaving machine weaving at a rate between 560 to 640 picks per minute.

- 2. The label of claim 1, wherein the thickness of the yarn is between 50 denier and 75 denier.

- 3. The label of claim 1, wherein the density comprises a range between 90 to 100 picks per centimeter.

- 4. A clothing woven label, comprising:
 - a first yarn having a first color and a first thickness less than 75 denier;

- a second yarn having a second color and a second thickness less than 75 denier; and

a density of at least 90 picks per centimeter.

- 5. The label of claim 4, wherein the first thickness of the first yarn is between 50 denier and 75 denier.

- 6. The label of claim 4, wherein the second thickness of the second yarn is between 50 denier and 75 denier.

- 7. The label of claim 4, wherein the density comprises a range between 90 to 100 picks per centimeter.

- 8. A method of manufacturing a woven label, comprising:
 - providing a yarn with a thickness of 75 denier or less;
 - weaving the yarn at a speed less than 700 picks per minute; and

forming the label with a density of at least 80 picks per centimeter.

- 9. The method of claim 8, wherein weaving the yarn at the speed less than 700 picks per minute comprising weaving the yarn at the speed between 560 to 640 picks per minute.

- 10. The method of claim 8, wherein forming the label with the density of at least 80 picks per centimeter comprises forming the label with the density of 90 to 100 picks per centimeter.

- 11. The method of claim 8, further comprising programming a weaving machine to weave at the density between 90 to 100 picks per centimeter.

- 12. The method of claim 11, further comprising programming the weaving machine to weave at the rate of 560 to 640 picks per minute.

- 13. A label obtained by the method of claim 8.