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(54) **WARP KNITTED FABRIC AND METHOD OF MANUFACTURING THE SAME**

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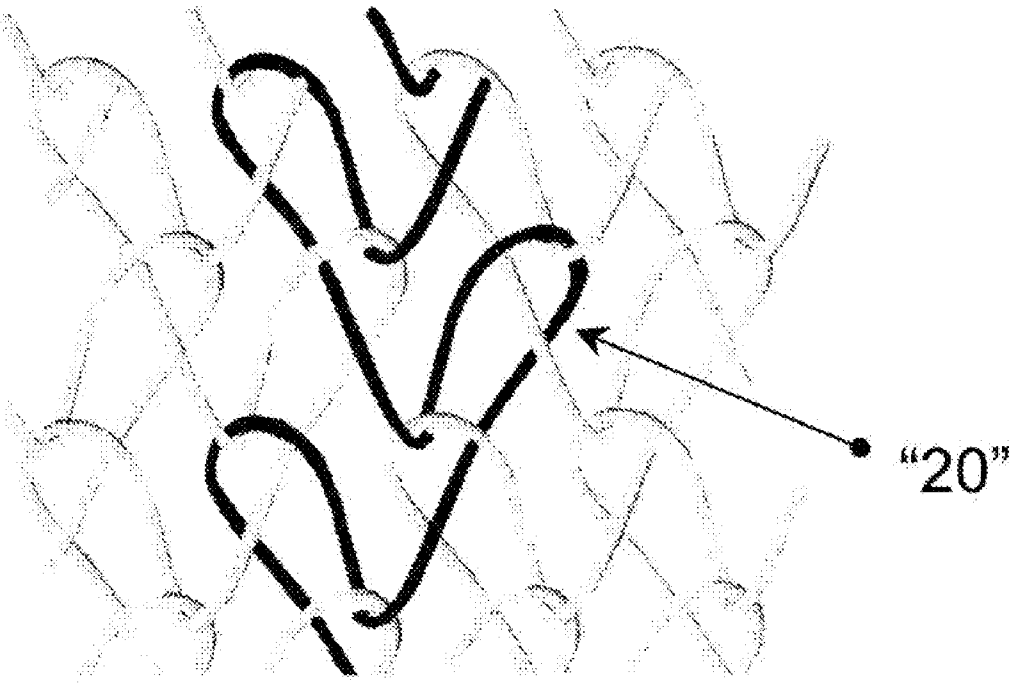
(57) **ABSTRACT**

A warp knitted fabric includes a set of non-elastomeric yarn of substantially the same type, fully threaded from a guide bar at the front side of the Tricot type warp knitting machine and knitted in a close 2×1 stitch pattern, and a set of elastomeric yarn of substantially the same type, fully threaded from a guide bar at the rear side of the Tricot type warp knitting machine and knitted in an open 1×1 pillar stitch pattern. The gripping and gummy characteristics on the technical face of the fabric composed of the non-elastomeric and elastomeric yarns are firmly accomplished and quantifiably exposed. A method of manufacturing the warp knitted fabric of this type is also disclosed.



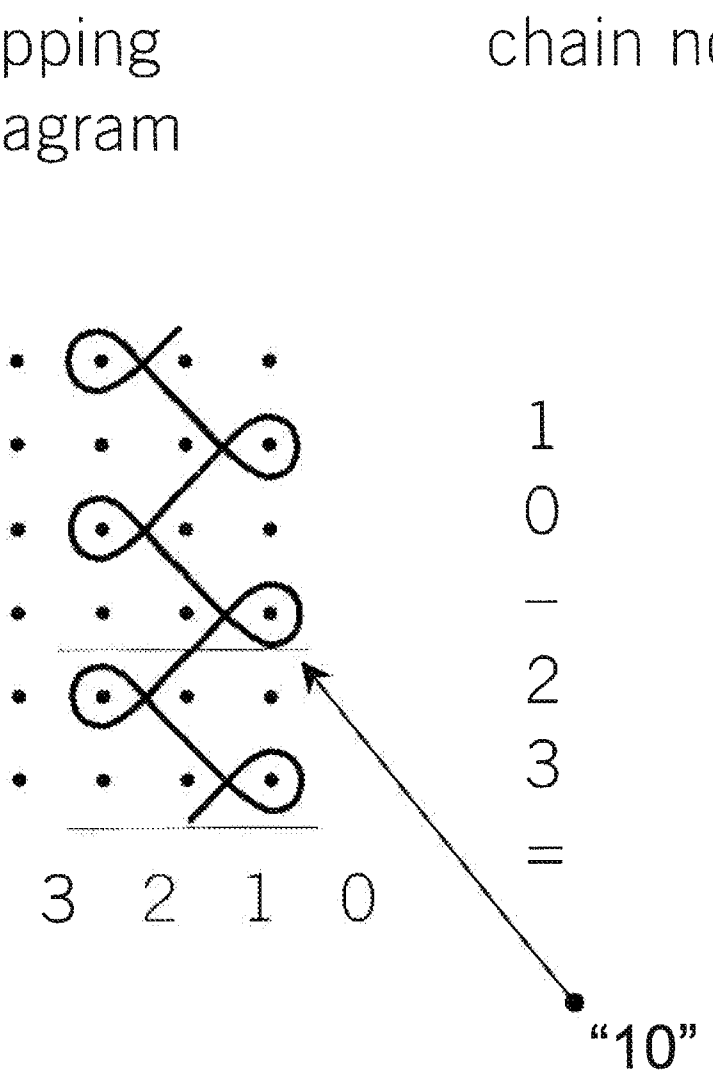


FIG. 1

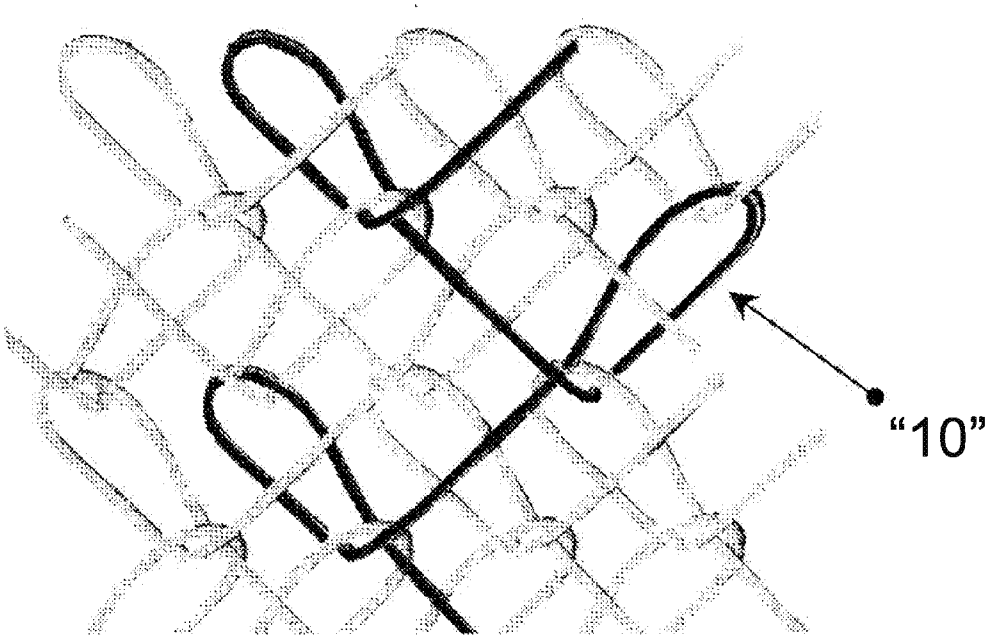


FIG. 2

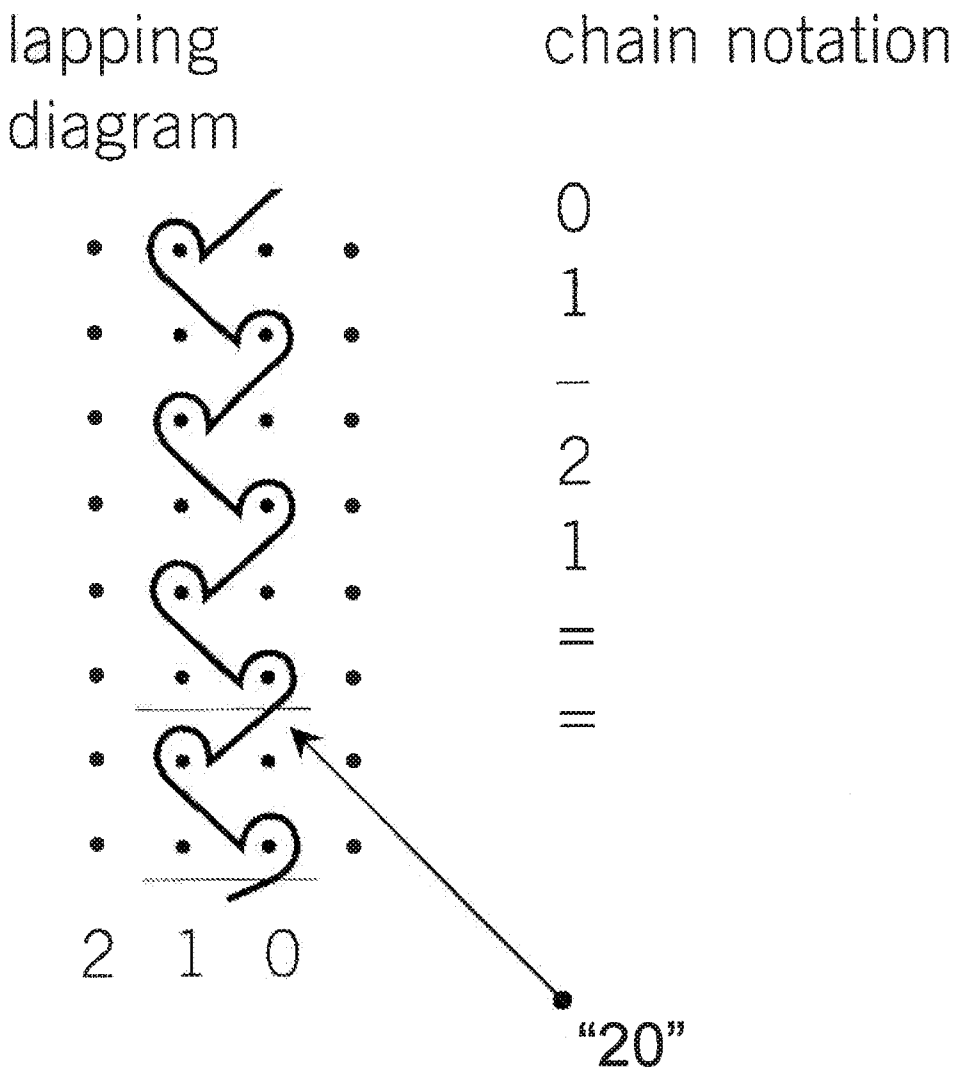


FIG. 3

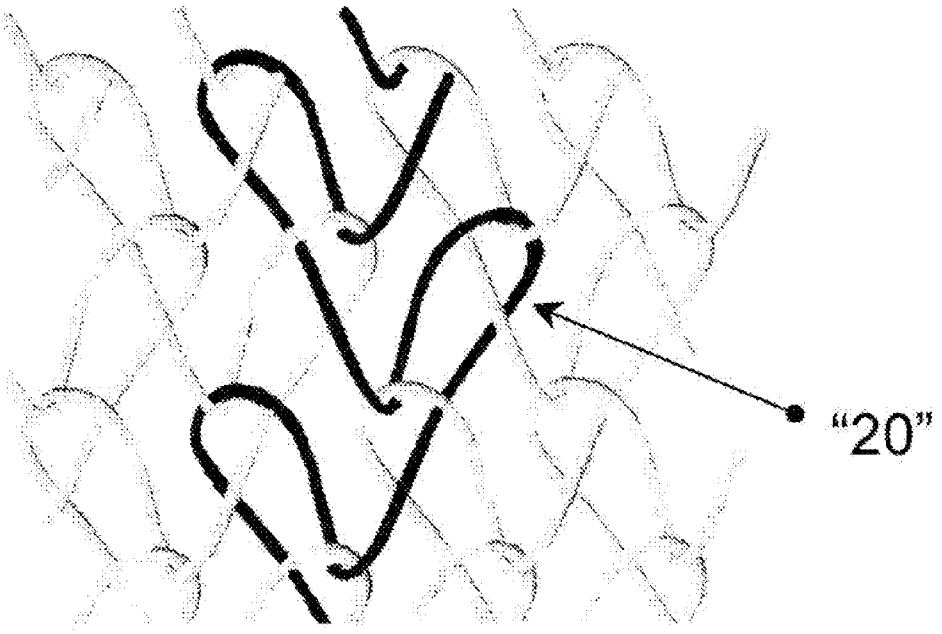


FIG. 4

WARP KNITTED FABRIC AND METHOD OF MANUFACTURING THE SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a Divisional application of U.S. patent application Ser. No. 14/074,737 filed on Nov. 8, 2013, the contents of which is hereby incorporated by reference.

FIELD OF TECHNOLOGY

[0002] The present application relates to a warp knitted fabric and a method of manufacturing warp knitted fabrics.

BACKGROUND

[0003] In the contemporary fashion market, designers never stop looking for new ideas in making fascinating, innovative and versatile products to catch the eyes of their potential customers, wherein the shine of various sorts plus the garment of multifunctional features contributes to the product by adding remarkably high extra value.

[0004] We have now developed a warp knit fabric that provides not just an unusual satin-look luster and smoothness on the commercial face of the fabric but a strong shaping power with good anti-snagging and gripping attributes.

[0005] Snagging, as we know, is an inherent enemy of all types of satin fabric. The reason is simply that the highly oriented yarns of long yarn length, aligning on the surface of the fabric, provides on one hand a high degree of mirror-like reflection of light from the fabric surface, but on the other hand a high degree of snagging attribute as well.

[0006] This fabric is made from a Tricot type warp knitting machine with the typical looping movements of the guide bars and the exclusively designed knitting parameters. It can satisfy needs from different aspects such as the unconventional sheen and smoothness of different sorts, anti-snagging attribute, good supporting power with high stretching recovery and gripping with secured touch.

[0007] There exist various end uses for this type of fabric such as shapewear, high power garments, sportswear, and intimate apparels, strapless garments on evening gowns or wedding dresses, swimsuits and so on.

[0008] The above description of the background is provided to aid in understanding a warp knitted fabric, but is not admitted to describe or constitute pertinent prior art to the warp knitted fabric disclosed in the present application, or consider any cited documents as material to the patentability of the claims of the present application.

[0009] Although the warp knitted fabric disclosed in the present application is shown and described with respect to certain embodiments, it is obvious that equivalents and modifications will occur to others skilled in the art upon the reading and understanding of the specification. The present application includes all such equivalents and modifications, and is limited only by the scope of the claims.

SUMMARY

[0010] According to one aspect, there is provided a warp knitted fabric including:

[0011] (a) a set of non-elastomeric yarns of substantially the same type, fully threaded from a first guide bar at a front side of a Tricot type warp knitting machine and knitted in a close 2×1 stitch pattern with the formulated effective ranges of:

[0012] I. yarn runner length, in the unit of millimeter per rack; and

[0013] II. aggregate linear mass density of yarn(s), in the unit of denier,

[0014] in accordance with a gauge of the knitting machine being adopted; and

[0015] (b) a set of elastomeric yarns of substantially the same type, fully threaded from a second guide bar at a rear side of a Tricot type warp knitting machine and knitted in an open 1×1 pillar stitch pattern with the formulated effective ranges of:

[0016] I. yarn runner length, in the unit of millimeter per rack; and

[0017] II. aggregate linear mass density of yarn(s), in the unit of denier,

[0018] in accordance with the gauge of the knitting machine being adopted;

[0019] (c) wherein the gripping and gummy characteristics on a technical face of the knitted fabric comprised of the non-elastomeric and elastomeric yarns are firmly accomplished and quantifiably uncovered.

[0020] In one embodiment, the formulated effective ranges of the yarn runner length, in the unit of millimeter per rack, of the non-elastomeric yarn against the machine gauge, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine are:

[0021] (d) the yarn runner length at a high side boundary that equals $4213\times e^{-0.0344\times(machine\ gauge)}$ with rounded off decimal; wherein "e" equals a constant number of "2.718281828459045 . . . "; and

[0022] (e) the yarn runner length at a low side boundary that equals $3447\times e^{-0.0344\times(machine\ gauge)}$ with rounded off decimal; and

[0023] (f) the ranges of the effective yarn runner length between the numerical solutions, with rounded off decimal, at the high side boundary in (d) and the low side boundary in (e).

[0024] In one embodiment, the formulated effective ranges of the yarn runner length, in the unit of millimeter per rack, of the elastomeric yarn, wrapped on the warp beam(s) with 50% accumulated beaming stretch, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine are:

[0025] (g) the yarn runner length at a high side boundary that equals $3246\times e^{-0.0456\times(machine\ gauge)}$ with rounded off decimal; and

[0026] (h) the yarn runner length at a low side boundary that equals $2399\times e^{-0.0456\times(machine\ gauge)}$ with rounded off decimal; and

[0027] (i) the ranges of the effective yarn runner lengths between the numerical solutions, with rounded off decimal, at the high side boundary in (g) and the low side boundary in (h).

[0028] In one embodiment, the formulated effective ranges of the aggregate linear mass density, in the unit of denier, of the non-elastomeric yarn(s) against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine are:

[0029] (j) the aggregate linear mass density at a high side boundary that equals $1398\times e^{-0.1\times(machine\ gauge)}$ with rounded off decimal; and

[0030] (k) the aggregate linear mass density at a low side boundary that equals $466\times e^{-0.1\times(machine\ gauge)}$ with rounded off decimal; and

[0031] (l) the ranges of the effective linear mass densities between the numerical solutions, with rounded off decimal, at the high side boundary in (j) and the low side boundary in (k).

[0032] In one embodiment, the formulated effective ranges of the aggregate linear mass density, in the unit of denier, of the elastomeric yarn(s) against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine are:

[0033] (m) the aggregate linear mass density at a high side boundary that equals $1463\times e^{-0.0832\times(machine\ gauge)}$ with rounded off decimal; and

[0034] (n) the aggregate linear mass density at a low side boundary that equals $488\times e^{-0.0832\times(machine\ gauge)}$ with rounded off decimal; and

[0035] (o) the ranges of the effective linear mass densities between the numerical solutions, with rounded off decimal, at the high side boundary in (m) and the low side boundary in (n).

[0036] In one embodiment, the threading of the non-elastomeric yarns is full threading, the threading of the elastomeric yarns is full threading. The non-elastomeric yarns are nylon yarns and the elastomeric yarns are spandex yarns.

[0037] According to another aspect, there is provided a method of manufacturing warp knitted fabrics comprising the steps of:

[0038] (a) selecting a machine gauge of a Tricot type warp knitting machine based on a required fabric weight in the unit of gram per square meter; and

[0039] (b) selecting an aggregate linear mass density of a non-elastomeric yarn with first formulated effective ranges for an applicable yarn fineness, corresponding to the gauge of the warp knitting machine being adopted; and

[0040] (c) selecting an aggregate linear mass density of an elastomeric yarn with second formulated effective ranges for an applicable yarn fineness, corresponding to the gauge of the warp knitting machine being adopted; and

[0041] (d) selecting a runner length of the non-elastomeric yarn with first formulated effective ranges for an applicable yarn runner length, corresponding to the gauge of the warp knitting machine being adopted; and

[0042] (e) selecting a runner length of the elastomeric yarn with second formulated effective ranges for an applicable yarn runner length, corresponding to the gauge of the warp knitting machine being adopted; and

[0043] (f) knitting a set of the non-elastomeric yarns of substantially the same type, fully threaded from a first guide bar at a front side of the Tricot type warp knitting machine and knitted in a close 2×1 stitch pattern; and

[0044] (g) knitting a set of the elastomeric yarns of substantially the same type, fully threaded from a second guide bar at a rear side of the Tricot type warp knitting machine and knitted in an open 1×1 pillar stitch pattern;

[0045] (h) wherein the gripping and gummy characteristics on a technical face of the knitted fabric comprised of the non-elastomeric and elastomeric yarns are firmly accomplished and quantifiably uncovered.

[0046] In one embodiment, the major processes of manufacturing the warp knitted fabrics comprise the techniques of:

[0047] (p) establishing the first formulated effective ranges of the aggregate linear mass density, in the unit of denier, of the non-elastomeric yarn(s) against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine where:

[0048] I. the aggregate linear mass density at a high side boundary equals $1398\times e^{-0.1\times(machine\ gauge)}$ with rounded off decimal; and

[0049] II. the aggregate linear mass density at a low side boundary equals $466\times e^{-0.1\times(machine\ gauge)}$ with rounded off decimal; and

[0050] III. the ranges of the effective linear mass densities are laid between the numerical solutions, with rounded off decimal, at the high side boundary in (p)I and the low side boundary in (p)II; and

[0051] (q) establishing the second formulated effective ranges of the aggregate linear mass density, in the unit of denier, of the elastomeric yarn(s) against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine where:

[0052] I. the aggregate linear mass density at a high side boundary equals $1463\times e^{-0.0832\times(machine\ gauge)}$ with rounded off decimal; and

[0053] II. the aggregate linear mass density at a low side boundary equals $488\times e^{-0.0832\times(machine\ gauge)}$ with rounded off decimal; and

[0054] III. the ranges of the effective linear mass densities are laid between the numerical solutions, with rounded off decimal, at the high side boundary in (q)I and the low side boundary in (q)II.

[0055] In one embodiment, the major processes of manufacturing the warp knitted fabrics comprise the techniques of:

[0056] (r) establishing the first formulated effective ranges of the runner length, in the unit of millimeter per rack, of the non-elastomeric yarn(s), fully threaded from a guide bar at the front side of the Tricot type warp knitting machine, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

[0057] I. the yarn runner length at a high side boundary equals $4213\times e^{-0.344\times(machine\ gauge)}$ with rounded off decimal; and

[0058] II. the yarn runner length at a low side boundary equals $3447\times e^{-0.0344\times(machine\ gauge)}$ with rounded off decimal; and

[0059] III. the ranges of the effective yarn runner lengths are laid between the numerical solutions, with rounded off decimal, at the high side boundary in (r)I and the low side boundary in (r)II; and

[0060] (s) establishing the second formulated effective ranges of the runner length, in the unit of millimeter per rack, of the elastomeric yarn, wrapped on the warp beam(s) with 50% accumulated beaming stretch and fully threaded from a guide bar at the rear side of the Tricot type warp knitting machine, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

[0061] I. the yarn runner length at a high side boundary equals $3246\times e^{-0.0456\times(machine\ gauge)}$ with rounded off decimal; and:

[0062] II. the yarn runner length at a low side boundary equals $2399\times e^{-0.0456\times(machine\ gauge)}$ with rounded off decimal; and

[0063] III. the ranges of the effective yarn runner lengths are laid between the numerical solutions, with rounded off decimal, at the high side boundary in (s)I and the numerical solution at the low side boundary in (s)II.

[0064] In one embodiment, the major processes of manufacturing the warp knitted fabrics comprise the techniques of:

[0065] (t) establishing effective ranges of fabric pulling tension immediately after the fabric being formed on the Tricot type warp knitting machine, also known as take-up tension, in the unit of course per centimeter, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

[0066] I. the take-up tension at a high side boundary equals the numerical solution, with rounded off decimal, of the product of the positive rational number of "1.15" and the positive integer number of the machine gauge being adopted, added by the positive integer number of "16"; and

[0067] II. the take-up tension at a low side boundary equals the numerical solution, with rounded off decimal, of the product of the positive rational number of "0.85" and the positive integer number of the machine gauge being adopted, added by the positive integer number of "12"; and

[0068] III. the ranges of the effective take-up tensions are laid between the numerical solutions, with rounded off decimal, at the high side boundary in (t)I and the low side boundary in (t)II.

[0069] In one embodiment, the knitting of the non-elastomeric and elastomeric yarns is carried out by a Tricot type warp knitting machine. The non-elastomeric yarns are nylon yarns and the elastomeric yarns are spandex yarns.

[0070] In a further aspect, there is provided an article of clothing made of the warp knitted fabric above-mentioned.

BRIEF DESCRIPTION OF THE DRAWINGS

[0071] Specific embodiments of the warp knitted fabric disclosed in the present application will now be described by way of example with reference to the accompanying drawings.

[0072] FIG. **1** is a lapping diagram and a chain notation of a non-elastomeric yarn threaded from the guide bar at the front side of the knitting machine and knitted in a close 2×1 stitch loop structure according to an embodiment disclosed in the present application.

[0073] FIG. **2** is a loop structure of the technical back of warp knitted non-elastomeric yarns of FIG. **1**.

[0074] FIG. **3** is a lapping diagram and a chain notation of an elastomeric yarn threaded from the guide bar at the rear side of the knitting machine and knitted in an open 1×1 pillar stitch loop structure according to an embodiment disclosed in the present application.

[0075] FIG. **4** is a loop structure of the technical back of warp knitted elastomeric yarns of FIG. **3**.

DETAILED DESCRIPTION

[0076] Reference will now be made in detail to a preferred embodiment of the warp knitted fabric disclosed in the present application, examples of which are also provided in the following description. Exemplary embodiments of the warp knitted fabric disclosed in the present application are described in detail, although it will be apparent to those skilled in the relevant art that some features that are not particularly important to an understanding of the warp knitted fabric may not be shown for the sake of clarity.

[0077] Furthermore, it should be understood that the warp knitted fabric disclosed in the present application is not limited to the precise embodiments described below and that various changes and modifications thereof may be effected by one skilled in the art without departing from the spirit or scope of the appended claims. For example, elements and/or features of different illustrative embodiments may be combined with each other and/or substituted for each other within the scope of this disclosure and appended claims.

[0078] The warp knitted fabric of the present application can be manufactured by a Tricot type warp knitting machine with at least 2 guide bars, wherein at least one of the guide bars at the front side of the machine is designed for lapping non-elastomeric yarns on the knitting needles to perform the knitting action, known as a fabric or loop formation process, and at least one of the guide bars at the rear side of the machine is designed for lapping elastomeric yarns on the knitting needles to perform knitting action. The lapping motion of guide bars at front precedes that of the guide bars at rear but the knitting action for all guide bars takes place at once.

[0079] Considering a machine of two guide bars, the guide bar at front, named "guide bar **1**", can be made for lapping non-elastomeric yarns on the knitting needles, and the guide bar at rear, named "guide bar **2**", can be made for lapping elastomeric yarns on the knitting needles at a lagged period of time against that of "guide bar **1**" to perform the same knitting action all together. Yarns can be threaded through the guide needles of the two guide bars and knitted in different stitch patterns to form the desired knitted fabric.

[0080] According to an embodiment of the present application, a non-elastomeric yarn **10** may be threaded through the guide needles of "guide bar **1**" and knitted in a close 2×1 stitch pattern. FIG. **1** shows a lapping diagram and a chain notation of the non-elastomeric yarn **10** threaded through the guide needles of "guide bar **1**" and knitted in a close 2×1 stitch pattern. The non-elastomeric yarn **10** may be nylon, or any other suitable non-elastomeric yarns. A loop structure of the technical back of warp knitted non-elastomeric yarns **10** is shown in FIG. **2**.

[0081] According to an embodiment of the present application, an elastomeric yarn **20** may be threaded through the guide needles of "guide bar **2**" and knitted in an open 1×1 pillar stitch pattern. FIG. **3** shows a lapping diagram and a chain notation of the elastomeric yarn **20** threaded through the guide needles of "guide bar **2**" and knitted in an open 1×1 pillar stitch pattern. The elastomeric yarn **20** may be spandex, or any other elastic yarn having substantially the same characteristics of spandex. A loop structure of the technical back of warp knitted elastomeric yarns **20** is shown in FIG. **4**.

[0082] According to an embodiment of the present application, the method of threading for both non-elastomeric and elastomeric yarns **10**, **20** is full threading. The term "full threading" can be considered as one of the threading methods for the guide bar(s) that allows all knitting needles of the machine to lap with a yarn of a particular type from the corresponding guide needles of one or more threaded guide bars.

[0083] According to an embodiment of the present application, there may be formulated effective ranges of yarn runner length, in the unit of millimeter per rack, of the non-elastomeric and elastomeric yarns **10**, **20** against the machine gauge, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine.

[0084] According to an embodiment of the present application, there may be formulated effective ranges of aggregate linear mass density, in the unit denier, of the non-elastomeric and elastomeric yarns **10**, **20** against the machine gauge, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine.

[0085] The warp knitted fabric may be composed of the non-elastomeric yarns **10** such as nylon or any other suitable non-elastomeric yarn of proper types and fineness, and elastomeric yarns **20** such as spandex of different elasticity and fineness. By using a Tricot type warp knitting machine, one can produce high-end warp knitted fabrics for garment products meeting different elasticity and weight requirements for both men and women.

[0086] The warp knitted fabric of the present application is suitable for many types of high-end underwear and clothing such as panties, brassieres, shapewears, bodysuits, sportswear, strapeless evening gowns or wedding dresses, swimsuits and so on.

[0087] To manufacture the warp knitted fabrics of the present application, an operator may need to follow the steps of:

[0088] 1. selecting an appropriate machine gauge of the Tricot type warp knitting machine based on the required fabric weight in the unit of gram per square meter (for example one may use the machine gauge of 40 needles per inch to knit a fabric of 154 gram-per-square meter weight); and

[0089] 2. selecting an appropriate linear mass density of the non-elastomeric yarn **10** with the formulated effective ranges for an applicable yarn fineness, corresponding to the gauge of the warp knitting machine being adopted (for example, one may use 20 denier non-elastomeric nylon yarn if the machine gauge is 40); and

[0090] 3. selecting an appropriate linear mass density of the elastomeric yarn **20** with the formulated effective ranges for an applicable yarn fineness, corresponding to the gauge of the warp knitting machine being adopted (for example, one may use 40 denier elastomeric spandex yarn if the machine gauge is 40); and

[0091] 4. selecting an appropriate runner length of the non-elastomeric yarn **10** with the formulated effective ranges for an applicable yarn runner length, corresponding to the gauge of the warp knitting machine being adopted (for example, one may use a runner length of 1030 mm per rack with a 20-denier non-elastomeric nylon yarn if the machine gauge is 40); and

[0092] 5. selecting an appropriate runner length of the elastomeric yarn **20** with the formulated effective ranges for an applicable yarn runner length, corresponding to the gauge of the warp knitting machine being adopted (for example, one may use a runner length of 480 mm per rack with a 40-denier elastomeric spandex yarn of 50% accumulated beaming stretch if the machine gauge is 40); and

[0093] 6. knitting a set of non-elastomeric yarns **10** of substantially the same type, fully threaded from a guide bar at the front side of the Tricot type warp knitting machine and knitted in a close 2×1 stitch pattern; and

[0094] 7. knitting a set of elastomeric yarns **20** of substantially the same type, fully threaded from a guide bar at the rear side of the Tricot type warp knitting machine and knitted in an open 1×1 pillar stitch pattern.

[0095] To manufacture the warp knitted fabrics of the present application, an operator may need to apply the techniques of:

[0096] 1. establishing the effective ranges of the aggregate linear mass density, in the unit of denier, of the non-elastomeric yarn(s) **10** against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine where:

[0097] (a) the aggregate linear mass density at a high side boundary equals $1398\times e^{-0.1\times(machine\ gauge)}$ with rounded off decimal; and

[0098] (b) the aggregate linear mass density at a low side boundary equals $466\times e^{-0.1\times(machine\ gauge)}$ with rounded off decimal; and

[0099] (c) the ranges of the effective linear mass densities are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 1(a) and the low side boundary in 1(b). (For example, one may use a 20-denier non-elastomeric nylon yarn if the machine gauge is ranged from 36 through 40 inclusively); and

[0100] 2. establishing the effective ranges of the aggregate linear mass density, in the unit of denier, of the elastomeric yarn(s) against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine where:

[0101] (a) the aggregate linear mass density at a high side boundary equals $1463\times e^{-0.0832\times(machine\ gauge)}$ with rounded off decimal; and

[0102] (b) the aggregate linear mass density at a low side boundary equals $488\times e^{-0.0832\times(machine\ gauge)}$ with rounded off decimal; and

[0103] (c) the ranges of the effective linear mass densities are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 2(a) and the low side boundary in 2(b). (For example, one may use a 40-denier elastomeric spandex yarn if the machine gauge is ranged from 36 through 40 inclusively.)

[0104] To manufacture the warp knitted fabrics of the present application, an operator may need to apply the techniques of:

[0105] 1. establishing the effective ranges of the runner lengths, in the unit of millimeter per rack, of the non-elastomeric yarn(s), fully threaded from a guide bar at the front side of the Tricot type warp knitting machine, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

[0106] (a) the yarn runner length at a high side boundary equals $4213\times e^{-0.0344\times(machine\ gauge)}$ with rounded off decimal; wherein "e" equals a constant number of "2.718281828459045 . . . "; and

[0107] (b) the yarn runner length at a low side boundary equals $3447\times e^{-0.0344\times(machine\ gauge)}$ with rounded off decimal; and

[0108] (c) the ranges of the effective yarn runner length are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 1(a) and the low side boundary in 1(b). (For example, one may use a runner length of 1030 mm per rack with a 20-denier non-elastomeric nylon yarn if the machine gauge is ranged from 36 through 40 inclusively); and

[0109] 2. establishing the effective ranges of the runner lengths, in the unit of millimeter per rack, of the elastomeric yarn, wrapped on the warp beam(s) with 50% accumulated beaming stretch and fully threaded from a guide bar at the rear side of the Tricot type warp knitting machine, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

[0110] (a) the yarn runner length at a high side boundary equals $3246\times e^{0.0456\times(machine\ gauge)}$ with rounded off decimal; and

[0111] (b) the yarn runner length at a low side boundary equals $2399 \times e^{-0.0456 \times (machine\ gauge)}$ with rounded off decimal; and

[0112] (c) the ranges of the effective yarn runner lengths are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 2(a) and the low side boundary in 2(b). (For example, one may use a runner length of 480 mm per rack with a 40-denier elastomeric spandex yarn of 50% accumulated beaming stretch if the machine gauge is ranged from 36 through 40 inclusively).

[0113] To manufacture the warp knitted fabrics of the present application, an operator may need to apply the techniques of:

[0114] 1. establishing the effective ranges of the fabric pulling tension immediately after the fabric being formed on the Tricot type warp knitting machine, also known as the take-up tension, in the unit of course per centimeter, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

[0115] (a) the take-up tension at the high side boundary equals the numerical solution, with rounded off decimal, of the product of the positive rational number of "1.15" and the positive integer number of the machine gauge being adopted, added by the positive integer number of "16"; and

[0116] (b) the take-up tension at the low side boundary equals the numerical solution, with rounded off decimal, of the product of the positive rational number of "0.85" and the positive integer number of the machine gauge being adopted, added by the positive integer number of "12"; and

[0117] (c) the ranges of the effective take-up tensions are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 1(a) and the low side boundary in 1(b) (for example, one may use a pulling tension of 52 courses per inch if the machine gauge is ranged from 36 through 40 inclusively).

[0118] After the knitting process, other subsequent processes such as degreasing process, thermal setting process, and dyeing process can be carried out.

[0119] The examples of manufacturing the warp knitted fabrics of the present application with an indication of basic knitting conditions and physical characteristics of the finish products are shown as below.

Example 1

[0120] Fabric Code: RS1231S

[0121] Color: Purple

[0122] Basic Fabric Parameters:

[0123] Non-elastomeric yarns: nylon yarn (8 deniers, 5 filaments, round bright type luster)

[0124] Elastomeric yarns: spandex yarn (20 deniers, clear type luster)

[0125] Proportion of non-elastomeric yarn (nylon): 59%

[0126] Proportion of elastomeric yarn (spandex): 41%

[0127] Weight of the finished product: 105 (gram per square meter)

[0128] Warp density of the finished product: 88 (courses per centimeter)

[0129] Weft density of the finished product: 47 (wales per centimeter)

[0130] Physical Characteristic Parameters of Finished Product:

[0131] (Testing method LTD-03, 7.5 pounds of stretch force)

[0132] Lengthwise stretch ratio: 238% (at 7.5 pounds of stretch force)

[0133] Widthwise stretch ratio: 125% (at 7.5 pounds of stretch force)

[0134] Lengthwise elastic modulus: 0.34 pound (at 40% stretch ratio)

[0135] Widthwise elastic modulus: 0.46 pounds (at 40% stretch ratio)

[0136] Lengthwise elastic modulus: 0.65 pounds (at 60% stretch ratio)

[0137] Widthwise elastic modulus: 0.97 pounds (at 60% stretch ratio)

[0138] Lengthwise stretching recovery: 93%

[0139] Widthwise stretching recovery: 96%

[0140] Lengthwise snagging: 2.5

[0141] Widthwise snagging: 3.5

[0142] Physical Characteristic Parameters of Finished Product:

[0143] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0144] Lengthwise gripping reading on the technical face of the fabric: 727 gram-force

[0145] Widthwise gripping reading on the technical face of the fabric: 687 gram-force

[0146] Lengthwise gripping reading on the technical back of the fabric: 55 gram-force

[0147] Widthwise gripping reading on the technical back of the fabric: 62 gram-force

[0148] Basic Knitting Parameters:

[0149] Type of knitting machine: 44 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0150] Total number of yarns of the first guide bar: 5712

[0151] Total number of yarns of the second guide bar: 5700

[0152] Runner length of the first guide bar: 800 mm per rack

[0153] Runner length of the second guide bar: 370 mm per rack (at 50% beaming stretch)

[0154] Machine take-up tension: 64 courses per centimeter

Example 2

[0155] Fabric Code: RS1247S

[0156] Color: White

[0157] Basic Parameters:

[0158] Non-elastomeric yarns: nylon yarn (10 deniers, 10 filaments, round bright type luster)

[0159] Elastomeric yarns: spandex yarn (20 deniers, clear type luster)

[0160] Proportion of non-elastomeric yarn (nylon): 59%

[0161] Proportion of elastomeric yarn (spandex): 41%

[0162] Weight of the finished product: 113 (gram per square meter)

[0163] Warp density of the finished product: 79 (courses per centimeter)

[0164] Weft density of the finished product: 46 (wales per centimeter)

[0165] Physical Characteristic Parameters of Finished Product:

[0166] (Testing method LTD-03, 7.5 pounds of stretch force)

[0167] Lengthwise stretch ratio: 212% (at 7.5 pounds of stretch force)

[0168] Widthwise stretch ratio: 125% (at 7.5 pounds of stretch force)

[0169] Lengthwise elastic modulus: 0.43 pound (at 40% stretch ratio)

[0170] Widthwise elastic modulus: 0.43 pounds (at 40% stretch ratio)

[0171] Lengthwise elastic modulus: 0.73 pounds (at 60% stretch ratio)

[0172] Widthwise elastic modulus: 0.94 pounds (at 60% stretch ratio)

[0173] Lengthwise stretching recovery: 95%

[0174] Widthwise stretching recovery: 94%

[0175] Lengthwise snagging: 2.5

[0176] Widthwise snagging: 2.0

[0177] Physical Characteristic Parameters of Finished Product:

[0178] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0179] Lengthwise gripping reading on the technical face of the fabric: 760 gram-force

[0180] Widthwise gripping reading on the technical face of the fabric: 660 gram-force

[0181] Lengthwise gripping reading on the technical back of the fabric: 65 gram-force

[0182] Widthwise gripping reading on the technical back of the fabric: 50 gram-force

[0183] Basic Knitting Parameters:

[0184] Type of knitting machine: 44 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0185] Total number of yarns of the first guide bar: 5712

[0186] Total number of yarns of the second guide bar: 5700

[0187] Runner length of the first guide bar: 820 mm per rack

[0188] Runner length of the second guide bar: 400 mm per rack (at 50% beaming stretch)

[0189] Machine take-up tension: 58 courses per centimeter

Example 3

[0190] Fabric Code: RS1041SE

[0191] Color: Nude

[0192] Basic Parameters:

[0193] Non-elastomeric yarns: nylon yarn (10 deniers, 5 filaments, round bright type luster)

[0194] Elastomeric yarns: spandex yarn (20 deniers, clear type luster)

[0195] Proportion of non-elastomeric yarn (nylon): 62%

[0196] Proportion of elastomeric yarn (spandex): 38%

[0197] Weight of the finished product: 85 (gram per square meter)

[0198] Warp density of the finished product: 69 (courses per centimeter)

[0199] Weft density of the finished product: 36 (wales per centimeter)

[0200] Physical Characteristic Parameters of Finished Product:

[0201] (Testing method LTD-03, 7.5 pounds of stretch force)

[0202] Lengthwise stretch ratio: 211% (at 7.5 pounds of stretch force)

[0203] Widthwise stretch ratio: 103% (at 7.5 pounds of stretch force)

[0204] Lengthwise elastic modulus: 0.37 pound (at 40% stretch ratio)

[0205] Widthwise elastic modulus: 0.80 pounds (at 40% stretch ratio)

[0206] Lengthwise elastic modulus: 0.57 pounds (at 60% stretch ratio)

[0207] Widthwise elastic modulus: 1.54 pounds (at 60% stretch ratio)

[0208] Lengthwise stretching recovery: 97%

[0209] Widthwise stretching recovery: 95%

[0210] Lengthwise snagging: 2.5

[0211] Widthwise snagging: 3.0

[0212] Physical Characteristic Parameters of Finished Product:

[0213] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0214] Lengthwise gripping reading on the technical face of the fabric: 495 gram-force

[0215] Widthwise gripping reading on the technical face of the fabric: 470 gram-force

[0216] Lengthwise gripping reading on the technical back of the fabric: 158 gram-force

[0217] Widthwise gripping reading on the technical back of the fabric: 128 gram-force

[0218] Basic Knitting Parameters:

[0219] Type of knitting machine: 40 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0220] Total number of yarns of the first guide bar: 5010

[0221] Total number of yarns of the second guide bar: 4992

[0222] Runner length of the first guide bar: 920 mm per rack

[0223] Runner length of the second guide bar: 500 mm per rack (at 50% beaming stretch)

[0224] Machine take-up tension: 52 courses per centimeter

Example 4

[0225] Fabric Code: RS1007S

[0226] Color: Purple

[0227] Basic Parameters:

[0228] Non-elastomeric yarns: nylon yarn (20 deniers, 24 filaments, bright trilobal type luster)

[0229] Elastomeric yarns: spandex yarn (40 deniers, clear type luster)

[0230] Proportion of non-elastomeric yarn (nylon): 65%

[0231] Proportion of elastomeric yarn (spandex): 35%

[0232] Weight of the finished product: 154 (gram per square meter)

[0233] Warp density of the finished product: 62 (courses per centimeter)

[0234] Weft density of the finished product: 37 (wales per centimeter)

[0235] Physical Characteristic Parameters of Finished Product:

[0236] (Testing method LTD-03, 7.5 pounds of stretch force)

[0237] Lengthwise stretch ratio: 169% (at 7.5 pounds of stretch force)

[0238] Widthwise stretch ratio: 97% (at 7.5 pounds of stretch force)

[0239] Lengthwise elastic modulus: 0.65 pound (at 40% stretch ratio)

[0240] Widthwise elastic modulus: 0.58 pounds (at 40% stretch ratio)

[0241] Lengthwise elastic modulus: 1.08 pounds (at 60% stretch ratio)

[0242] Widthwise elastic modulus: 1.26 pounds (at 60% stretch ratio)

[0243] Lengthwise stretching recovery: 94%

[0244] Widthwise stretching recovery: 95%

[0245] Lengthwise snagging: 4.5

[0246] Widthwise snagging: 4.0

[0247] Physical Characteristic Parameters of Finished Product:

[0248] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0249] Lengthwise gripping reading on the technical face of the fabric: 500 gram-force

[0250] Widthwise gripping reading on the technical face of the fabric: 500 gram-force

[0251] Lengthwise gripping reading on the technical back of the fabric: 198 gram-force

[0252] Widthwise gripping reading on the technical back of the fabric: 188 gram-force

[0253] Basic Knitting Parameters:

[0254] Type of knitting machine: 40 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0255] Total number of yarns of the first guide bar: 5010

[0256] Total number of yarns of the second guide bar: 4992

[0257] Runner length of the first guide bar: 980 mm per rack

[0258] Runner length of the second guide bar: 420 mm per rack (at 50% beaming stretch)

[0259] Machine take-up tension: 54 courses per centimeter

Example 5

[0260] Fabric Code: RS1221S

[0261] Color: Purple

[0262] Basic Parameters:

[0263] Non-elastomeric yarns: nylon yarn (20 deniers, 34 filaments, round bright type luster)

[0264] Elastomeric yarns: spandex yarn (40 deniers, clear type luster)

[0265] Proportion of non-elastomeric yarn (nylon): 65%

[0266] Proportion of elastomeric yarn (spandex): 35%

[0267] Weight of the finished product: 173 (gram per square meter)

[0268] Warp density of the finished product: 67 (courses per centimeter)

[0269] Weft density of the finished product: 37 (wales per centimeter)

[0270] Physical Characteristic Parameters of Finished Product:

[0271] (Testing method LTD-03, 7.5 pounds of stretch force)

[0272] Lengthwise stretch ratio: 179% (at 7.5 pounds of stretch force)

[0273] Widthwise stretch ratio: 108% (at 7.5 pounds of stretch force)

[0274] Lengthwise elastic modulus: 0.53 pound (at 40% stretch ratio)

[0275] Widthwise elastic modulus: 0.48 pounds (at 40% stretch ratio)

[0276] Lengthwise elastic modulus: 0.92 pounds (at 60% stretch ratio)

[0277] Widthwise elastic modulus: 0.96 pounds (at 60% stretch ratio)

[0278] Lengthwise stretching recovery: 93%

[0279] Widthwise stretching recovery: 93%

[0280] Lengthwise snagging: 2.0

[0281] Widthwise snagging: 2.0

[0282] Physical Characteristic Parameters of Finished Product:

[0283] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0284] Lengthwise gripping reading on the technical face of the fabric: 765 gram-force

[0285] Widthwise gripping reading on the technical face of the fabric: 653 gram-force

[0286] Lengthwise gripping reading on the technical back of the fabric: 315 gram-force

[0287] Widthwise gripping reading on the technical back of the fabric: 310 gram-force

[0288] Basic Knitting Parameters:

[0289] Type of knitting machine: 40 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0290] Total number of yarns of the first guide bar: 5010

[0291] Total number of yarns of the second guide bar: 4992

[0292] Runner length of the first guide bar: 980 mm per rack

[0293] Runner length of the second guide bar: 420 mm per rack (at 50% beaming stretch)

[0294] Machine take-up tension: 54 courses per centimeter

Example 6

[0295] Fabric Code: RS1249S

[0296] Color: Purple

[0297] Basic Parameters:

[0298] Non-elastomeric yarns: nylon yarn (12 deniers, 6 filaments, round bright type luster)

[0299] Elastomeric yarns: spandex yarn (30 deniers, clear type luster)

[0300] Proportion of non-elastomeric yarn (nylon): 58%

[0301] Proportion of elastomeric yarn (spandex): 42%

[0302] Weight of the finished product: 130 (gram per square meter)

[0303] Warp density of the finished product: 77 (courses per centimeter)

[0304] Weft density of the finished product: 39 (wales per centimeter)

[0305] Physical Characteristic Parameters of Finished Product:

[0306] (Testing method LTD-03, 7.5 pounds of stretch force)

[0307] Lengthwise stretch ratio: 227% (at 7.5 pounds of stretch force)

[0308] Widthwise stretch ratio: 106% (at 7.5 pounds of stretch force)

[0309] Lengthwise elastic modulus: 0.50 pound (at 40% stretch ratio)

[0310] Widthwise elastic modulus: 0.80 pounds (at 40% stretch ratio)

[0311] Lengthwise elastic modulus: 0.83 pounds (at 60% stretch ratio)

[0312] Widthwise elastic modulus: 1.68 pounds (at 60% stretch ratio)

[0313] Lengthwise stretching recovery: 96%

[0314] Widthwise stretching recovery: 95%

[0315] Lengthwise snagging: 2.0

[0316] Widthwise snagging: 2.0

[0317] Physical Characteristic Parameters of Finished Product:

[0318] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0319] Lengthwise gripping reading on the technical face of the fabric: 658 gram-force

[0320] Widthwise gripping reading on the technical face of the fabric: 585 gram-force

[0321] Lengthwise gripping reading on the technical back of the fabric: 88 gram-force

[0322] Widthwise gripping reading on the technical back of the fabric: 50 gram-force

[0323] Basic Knitting Parameters:

[0324] Type of knitting machine: 40 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0325] Total number of yarns of the first guide bar: 5010

[0326] Total number of yarns of the second guide bar: 4992

[0327] Runner length of the first guide bar: 900 mm per rack

[0328] Runner length of the second guide bar: 430 mm per rack (at 50% beaming stretch)

[0329] Machine take-up tension: 54 courses per centimeter

Example 7

[0330] Fabric Code: RS1275S

[0331] Color: Black

[0332] Basic Parameters:

[0333] Non-elastomeric yarns: nylon yarn (30 deniers, 34 filaments, round bright type luster)

[0334] Elastomeric yarns: spandex yarn (55 deniers, clear type luster)

[0335] Proportion of non-elastomeric yarn (nylon): 61%

[0336] Proportion of elastomeric yarn (spandex): 39%

[0337] Weight of the finished product: 210 (gram per square meter)

[0338] Warp density of the finished product: 56 (courses per centimeter)

[0339] Weft density of the finished product: 28 (wales per centimeter)

[0340] Physical Characteristic Parameters of Finished Product:

[0341] (Testing method LTD-03, 7.5 pounds of stretch force)

[0342] Lengthwise stretch ratio: 161% (at 7.5 pounds of stretch force)

[0343] Widthwise stretch ratio: 88% (at 7.5 pounds of stretch force)

[0344] Lengthwise elastic modulus: 0.97 pound (at 40% stretch ratio)

[0345] Widthwise elastic modulus: 0.90 pounds (at 40% stretch ratio)

[0346] Lengthwise elastic modulus: 1.55 pounds (at 60% stretch ratio)

[0347] Widthwise elastic modulus: 1.86 pounds (at 60% stretch ratio)

[0348] Lengthwise stretching recovery: 95%

[0349] Widthwise stretching recovery: 97%

[0350] Lengthwise snagging: 2.5

[0351] Widthwise snagging: 2.5

[0352] Physical Characteristic Parameters of Finished Product:

[0353] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0354] Lengthwise gripping reading on the technical face of the fabric: 635 gram-force

[0355] Widthwise gripping reading on the technical face of the fabric: 610 gram-force

[0356] Lengthwise gripping reading on the technical back of the fabric: 200 gram-force

[0357] Widthwise gripping reading on the technical back of the fabric: 175 gram-force

[0358] Basic Knitting Parameters:

[0359] Type of knitting machine: 32 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0360] Total number of yarns of the first guide bar: 4032

[0361] Total number of yarns of the second guide bar: 4020

[0362] Runner length of the first guide bar: 1200 mm per rack

[0363] Runner length of the second guide bar: 650 mm per rack (at 50% beaming stretch)

[0364] Machine take-up tension: 48 courses per centimeter

Example 8

[0365] Fabric Code: RS1277S

[0366] Color: Black

[0367] Basic Parameters:

[0368] Non-elastomeric yarns: nylon yarn (40 deniers, 34 filaments, dull type luster)

[0369] Elastomeric yarns: spandex yarn (70 deniers, clear type luster)

[0370] Proportion of non-elastomeric yarn (nylon): 68%

[0371] Proportion of elastomeric yarn (spandex): 32%

[0372] Weight of the finished product: 249 (gram per square meter)

[0373] Warp density of the finished product: 47 (courses per centimeter)

[0374] Weft density of the finished product: 27 (wales per centimeter)

[0375] Physical Characteristic Parameters of Finished Product:

[0376] (Testing method LTD-03, 7.5 pounds of stretch force)

[0377] Lengthwise stretch ratio: 96% (at 7.5 pounds of stretch force)

[0378] Widthwise stretch ratio: 70% (at 7.5 pounds of stretch force)

[0379] Lengthwise elastic modulus: 2.13 pound (at 40% stretch ratio)

[0380] Widthwise elastic modulus: 1.74 pounds (at 40% stretch ratio)

[0381] Lengthwise elastic modulus: 3.51 pounds (at 60% stretch ratio)

[0382] Widthwise elastic modulus: 4.55 pounds (at 60% stretch ratio)

[0383] Lengthwise stretching recovery: 96%

[0384] Widthwise stretching recovery: 95%

[0385] Lengthwise snagging: 3.5

[0386] Widthwise snagging: 3.5

[0387] Physical Characteristic Parameters of Finished Product:

[0388] (Testing method PTL gripping tester, fabric being pulled at a constant speed of 10 centimeters per minute under the weight of 200 grams)

[0389] Lengthwise gripping reading on the technical face of the fabric: 507 gram-force

[0390] Widthwise gripping reading on the technical face of the fabric: 575 gram-force

[0391] Lengthwise gripping reading on the technical back of the fabric: 142 gram-force

[0392] Widthwise gripping reading on the technical back of the fabric: 180 gram-force

[0393] Basic Knitting Parameters:

[0394] Type of knitting machine: 32 gauges, 2 guide bars, Tricot type warp-knitting machine (HKS 2-3E)

[0395] Total number of yarns of the first guide bar: 4032

[0396] Total number of yarns of the second guide bar: 4020

[0397] Runner length of the first guide bar: 1300 mm per rack

[0398] Runner length of the second guide bar: 700 mm per rack (at 50% beaming stretch)

[0399] Machine take-up tension: 46 courses per centimeter

[0400] While the warp knitted fabric and the method of manufacturing the same disclosed in the present application have been shown and described with particular references to a number of preferred embodiments thereof, it should be noted that various other changes or modifications may be made without departing from the scope of the appending claims.

What is claimed is:

1. A method of manufacturing warp knitted fabrics comprising the steps of:

(a) selecting a machine gauge of a Tricot type warp knitting machine based on a required fabric weight in the unit of gram per square meter; and

(b) selecting an aggregate linear mass density of a non-elastomeric yarn with first formulated effective ranges for an applicable yarn fineness, corresponding to the gauge of the warp knitting machine being adopted; and

(c) selecting an aggregate linear mass density of an elastomeric yarn with second formulated effective ranges for an applicable yarn fineness, corresponding to the gauge of the warp knitting machine being adopted; and

(d) selecting a runner length of the non-elastomeric yarn with first formulated effective ranges for an applicable yarn runner length, corresponding to the gauge of the warp knitting machine being adopted; and

(e) selecting a runner length of the elastomeric yarn with second formulated effective ranges for an applicable yarn runner length, corresponding to the gauge of the warp knitting machine being adopted; and

(f) knitting a set of the non-elastomeric yarns of substantially the same type, fully threaded from a first guide bar at a front side of the Tricot type warp knitting machine and knitted in a close 2×1 stitch pattern; and

(g) knitting a set of the elastomeric yarns of substantially the same type, fully threaded from a second guide bar at a rear side of the Tricot type warp knitting machine and knitted in an open 1×1 pillar stitch pattern;

(h) wherein the gripping and gummy characteristics on a technical face of the knitted fabric comprised of the non-elastomeric and elastomeric yarns are firmly accomplished and quantifiably uncovered.

2. The method as claimed in claim **1**, wherein major processes of manufacturing the warp knitted fabrics comprise the techniques of:

(a) establishing the first formulated effective ranges of the aggregate linear mass density, in the unit of denier, of the non-elastomeric yarn(s) against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine where:

I. the aggregate linear mass density at a high side boundary equals 1398×e-0.1×(machine gauge) with rounded off decimal; and

II. the aggregate linear mass density at a low side boundary equals 466×e-0.1×(machine gauge) with rounded off decimal; and

III. the ranges of the effective linear mass densities are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 2(a)I and the low side boundary in 2(a)II; and

(b) establishing the second formulated effective ranges of the aggregate linear mass density, in the unit of denier, of the elastomeric yarn(s) against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, of the Tricot type warp knitting machine where:

I. the aggregate linear mass density at a high side boundary equals 1463×e-0.0832×(machine gauge) with rounded off decimal; and

II. the aggregate linear mass density at a low side boundary equals 488×e-0.0832×(machine gauge) with rounded off decimal; and

III. the ranges of the effective linear mass densities are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 2(b)I and the low side boundary in 2(b)II.

3. The method as claimed in claim **1**, wherein major processes of manufacturing the warp knitted fabrics comprise the techniques of:

(a) establishing the first formulated effective ranges of the runner length, in the unit of millimeter per rack, of the non-elastomeric yarn(s), fully threaded from a guide bar at the front side of the Tricot type warp knitting machine,

against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

I. the yarn runner length at a high side boundary equals 4213×e-0.0344×(machine gauge) with rounded off decimal; and

II. the yarn runner length at a low side boundary equals 3447×e-0.0344×(machine gauge) with rounded off decimal; and

III. the ranges of the effective yarn runner lengths are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 3(a)I and the low side boundary in 3(a)II; and

(b) establishing the second formulated effective ranges of the runner length, in the unit of millimeter per rack, of the elastomeric yarn, wrapped on the warp beam(s) with 50% accumulated beaming stretch and fully threaded from a guide bar at the rear side of the Tricot type warp knitting machine, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

I. the yarn runner length at a high side boundary equals 3246×e-0.0456×(machine gauge) with rounded off decimal; and:

II. the yarn runner length at a low side boundary equals 2399×e-0.0456×(machine gauge) with rounded off decimal; and

III. the ranges of the effective yarn runner lengths are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 3(b)I and the numerical solution at the low side boundary in 3(b)II.

4. The method as claimed in claim **1**, wherein major processes of manufacturing the warp knitted fabrics comprise the techniques of:

(a) establishing effective ranges of fabric pulling tension immediately after the fabric being formed on the Tricot type warp knitting machine, also known as take-up tension, in the unit of course per centimeter, against the machine gauges, ranged inclusively from 28 needles per inch through 50 needles per inch, where:

I. the take-up tension at a high side boundary equals the numerical solution, with rounded off decimal, of the product of the positive rational number of "1.15" and the positive integer number of the machine gauge being adopted, added by the positive integer number of "16"; and

II. the take-up tension at a low side boundary equals the numerical solution, with rounded off decimal, of the product of the positive rational number of "0.85" and the positive integer number of the machine gauge being adopted, added by the positive integer number of "12"; and

III. the ranges of the effective take-up tensions are laid between the numerical solutions, with rounded off decimal, at the high side boundary in 4(a)I and the low side boundary in 4(a)II.

5. The method as claimed in claim **1**, wherein the knitting of the non-elastomeric and elastomeric yarns is carried out by a Tricot type warp knitting machine.

6. The method as claimed in claim **1**, wherein the non-elastomeric yarns are nylon yarns.

7. The method as claimed in claim **1**, wherein the elastomeric yarns are spandex yarns.

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