STRETCHABLE WARP KNIT FABRIC FOR CLOTHES, BOTTOM GARMENT, AND TUBULAR CLOTHES

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Pub. No.: US 2015/0292129 A1
Pub. Date: Oct. 15, 2015

Publication Classification
Int. Cl.
D04B 21/18 (2006.01)
A41C 1/02 (2006.01)
D04B 21/20 (2006.01)
A41C 1/00 (2006.01)
D04B 21/83 (2006.01)
A41C 1/02 (2006.01)
D04B 21/20 (2006.01)
A41C 1/00 (2006.01)

ABSTRACT
Between one course and the other course adjacent to each other, an amount of elastic yarns for the other course is set smaller than that for the one course so that the elastic yarn knitted into the other course is stretched by a resilience of the elastic yarn knitted into the one course contracting from a stretched state when being knitted. When making a power-enhanced knit fabric, elastic yarns are knitted under tension, so as to generate a difference in amounts of stretch of the elastic yarns during knitting, thereby producing a difference between repulsive forces of the elastic yarns for each pair of adjacent courses.
Fig. 2
Fig. 3

20

60A

X

70B

Y-6

Y-5

Y-4

Y-3

Y-2

Y-1

3 2 1 0 3 2 1 0
Fig. 9
Fig. 12
STRETCHABLE WARP KNIT FABRIC FOR CLOTHES, BOTTOM GARMENT, AND TUBULAR CLOTHES

TECHNICAL FIELD

[0001] The present invention relates to a stretchable warp knit fabric for clothes which is employable for garments and formed so as to come into close contact with a skin by being stretched upon wearing, a bottom garment, and a tubular garment.

BACKGROUND ART

[0002] Conventionally known in such a field is a stretchable knit fabric continuously knitted such that its tightening power varies locally (see, for example, Patent Literature 1). The technique described in Patent Literature 1 discloses a warp knit fabric in which a main knit fabric and a power-enhanced fabric are continuously knitted, while a runner of a yarn constituting the power-enhanced knit fabric and a runner of a yarn constituting the main knit fabric supply different amounts of yarns, respectively, so as to produce a power difference.

[0003] When knitting the same course, it is typically difficult for a knitting machine for knitting a warp knit fabric to change amounts of supply of yarns reeled out from only a part of runners. This makes it necessary to modify the knitting machine greatly in order to employ the warp knit fabric knitting method described in the above-mentioned Patent Literature 1.

[0004] In general, warp knit fabrics, which are knit fabrics formed by knitting yarns longitudinally, are relatively easy to produce fabrics having favorable elasticity in the longitudinal direction serving as the knitting direction. On the other hand, knit fabrics having excellent elasticity in the lateral direction, which is orthogonal to the yarn knitting direction, are harder to form than those for the longitudinal direction, thus leaving a problem.

CITATION LIST

Patent Literature


SUMMARY OF INVENTION

Technical Problem

[0006] In view of the problem of the above-mentioned conventional warp knit fabrics, it is an object of the present invention to provide a stretchable warp knit fabric for clothes, a bottom garment, and a tubular garment having improved elasticity in the lateral direction by producing a relatively mild power in a power-enhanced knit fabric at the beginning of stretching of the knit fabric and increasing the power in the middle.

Solution to Problem

[0007] The present invention provides a stretchable warp knit fabric for clothes, the warp knit fabric being employable for garments and formed so as to come into close contact with a skin by being stretched upon wearing, at least a part of the warp knit fabric including a power-enhanced knit fabric hav-
stretchable warp knit fabric for clothes is adapted to come into close contact with a front of an abdomen of a wearer. [0015] The present invention provides a method for manufacturing a stretchable warp knit fabric for clothes, the warp knit fabric being employable for garments and formed so as to come into close contact with a skin by being stretched at the time of wearing, the method comprising knitting at least a part of the warp knit fabric including a power-enhanced knit fabric having one course and the other course adjacent to each other such that an amount of an elastic yarn for the other course is set smaller than that for the one course so that the elastic yarn knitted into the other course is stretched by a resilience of the elastic yarn knitted into the one course contracting from a stretched state when being knitted. [0016] This method for manufacturing a stretchable warp knit fabric for clothes sets, in one course and the other course adjacent to each other, the amount of the elastic yarn knitted into the other course smaller than the amount of the elastic yarn knitted into the one course so that the elastic yarn knitted into the other course is stretched by a resilience of the elastic yarn knitted into the one course contracting from a stretched state when being knitted. [0017] Between courses adjacent to each other, knitted elastic yarns having different amounts by changing their thicknesses or numbers, for example, vary their amounts of stretch when being knitted. The thicker yarn (the elastic yarn having the greater diameter) is knitted under a higher tension. As a consequence, when the forces of the elastic yarns are in balance with each other after the lapse of a predetermined time from the knitting of a warp knit fabric (when the fabric is relaxed), the thinner yarn is stabilized in a less tensed state (i.e., under a weaker tension) by a stronger resilience (restoring force) of the thicker yarn. This can produce a difference between repulsive forces of the elastic yarns for each pair of adjacent courses in the state where no external force acts on the warp knit fabric. As a result, at the beginning of stretching when the warp knit fabric is stretched in the lateral direction, a power is generated in the thinner yarn, while no power substantially occurs in the thicker yarn, whereby a relatively mild power can be produced. When the amount of stretch of the warp knit fabric further increases, on the other hand, a power also occurs in the thicker yarn.

Advantageous Effects of Invention [0018] The present invention can provide a stretchable warp knit fabric for clothes, a bottom garment, and a tubular garment which can produce a relatively mild power in a power-enhanced knit fabric at the beginning of stretching of the knit fabric and increase the power in the middle, so as to improve elasticity in the lateral direction.

BRIEF DESCRIPTION OF DRAWINGS [0019] FIG. 1 is a front view of the stretchable warp knit fabric for clothes in accordance with a first embodiment of the present invention; [0020] FIG. 2 is a structural diagram of a first region in FIG. 1; [0021] FIG. 3 is a structural diagram illustrating the arrangement of elastic and nonelastic yarns in the first region; [0022] FIG. 4 is a structural diagram of a second region in FIG. 1; [0023] FIG. 5 is a plan view illustrating the arrangement of elastic and nonelastic yarns in the second region; [0024] FIG. 6 is a structural diagram of a third region in FIG. 1; [0025] FIG. 7 is a plan view illustrating the arrangement of elastic and nonelastic yarns in the third region; [0026] FIG. 8 is a structural diagram of a fourth region in FIG. 1; [0027] FIG. 9 is a plan view illustrating the arrangement of elastic and nonelastic yarns in the fourth region; [0028] FIG. 10 is a schematic view illustrating arrangements of yarns in a knit fabric in a relaxed state; [0029] FIG. 11 is a front view of the stretchable warp knit fabric for clothes in accordance with a second embodiment of the present invention; [0030] FIG. 12 is a perspective view of a girdle in accordance with a third embodiment of the present invention; and [0031] FIG. 13 is a front view of a waist nipper in accordance with a fourth embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS [0032] In the following, preferred embodiments of the stretchable warp knit fabric for clothes, bottom garment, and tubular garment will be explained with reference to the drawings. In the explanation of drawings, the same or equivalent parts will be referred to with the same signs while omitting their overlapping descriptions. [0033] Stretchable Knit Fabric for Clothes [0034] A knit fabric 10 illustrated in FIG. 1 has base parts 11 (main knit fabrics) and a power-enhanced part 12 (power-enhanced knit fabric) having a power stronger than that of the base parts 11. The knit fabric 10 is a stretchable warp knit fabric for clothes employable for garments and formed so as to come into close contact with a skin by being stretched upon wearing. The base parts 11 and power-enhanced part 12 are adjacent to each other in a wale direction. By the wale direction is meant the lateral direction indicated by arrow X. By a course direction is meant the vertical direction indicated by arrow Y, i.e., the direction in which yarns constituting each knit structure are knitted. In the structural diagrams of FIGS. 2, 4, 6, and 8, black dots indicate the width of progress of each course and illustrate how a yarn is knitted in each course when knitted in the direction of arrow Y. [0035] The knit fabric 10 can be knitted by a warp knitting machine such as a Jacquard Raschel machine (not depicted), for example. [0036] The base parts 11 are basic structures of warp knitting in which stitches (loops) are formed by a ground yarn. The base parts 11 can employ Denbigh stitch, Atlas stitch, and the like as its basic structure, for example. The stitches of the base parts may be either closed or open. [0037] The power-enhanced part 12 has a plurality of regions 20, 30, 40, 50 having different structures. FIG. 1 illustrates an arrangement of regions of regions 20, 30, 40, 50. The first region 20 is arranged in a center portion of the power-enhanced part 12. The second region 30 is arranged outside of the first region 20. The third region 40 is arranged so as to surround the first region 20. A plurality of fourth regions 40, each having a circular form, for example, are arranged along the third region 40. [0038] The first region 20 is formed into a diamond shape (rhomboid), for example, in planar view. The second region 30 is formed into an inverted triangle, for example, in planar view. [0039] In this embodiment, the fourth region 50, second region 30, first region 20, and third region 40 are in ascending
order of the power of the knit fabric. The fourth region 50 has the weakest power, whereas the third region 40 has the strongest power. By a knit fabric having a strong power is meant that the amount of stretch is small when a force acts on the knit fabric. That is, the tensile force required for obtaining the same amount of stretch is large.

[0040] Power-Enhanced Part: First Region

[0041] In FIG. 2, the courses are sequentially labeled as X-1, X-2, X-3, X-4, X-5, and X-6 from left to right (as in FIGS. 4, 6, and 8 in the following). Also, signs Y-1, Y-2, Y-3, Y-4, Y-5, and Y-6 are sequentially provided in increments of 1 course from the lower side to the upper side: Y-6, Y-5, Y-4, . . . are knitted in this order, while the position of Y-1 indicates a location at which each knit structure is knitted by a reed which is not depicted.

[0042] The first region 20 in the power-enhanced part 12 has a knit structure A (nonelastic yarn: 60A) and an insertion structure B (elastic yarn: 70B).

[0043] FIG. 3 is a structural diagram illustrating the structures in the first region 20 in FIG. 2. In order to represent knitting of yarns by needle positions, the structural diagram of FIG. 3 assigns 0 to the rightmost position between courses where each yarn passes as being guided by a guide bar and numbers 1, 2, 3, . . . sequentially leftward therefrom. It also provides signs Y-1, Y-2, Y-3, . . . , in increments of 1 course from the lower side to the upper side (as in FIGS. 5, 7, and 9 in the following).

[0044] In the movement of the reed knitting the knit structure A (60A), one repetition unit can be represented by 32/12/ 21/01/21/12/. The knitting yarn of the knit structure A is constituted by a nonelastic yarn.

[0045] The knit structure A forms a loop as it progresses by 1 course. Examples of the nonelastic yarn used in the knit structure A include nylon and polyester yarns.

[0046] The knit structure A forms an open stitch at the position Y-1 and progresses rightward by 1 course as a swing width of 1 wale, so as to reach the position Y-2. The knit structure A forms an open stitch at the position Y-2 and progresses by 1 course without moving in the wale direction, so as to reach the position Y-3. The knit structure A forms an open stitch at the position Y-3 and progresses rightward by 1 course as a swing width of 1 wale, so as to reach the position Y-4.

[0047] The knit structure A forms an open stitch at the position Y-4 and progresses leftward by 1 course as a swing width of 1 wale, so as to reach the position Y-5. The knit structure A forms an open stitch at the position Y-5 and progresses by 1 course without moving in the wale direction, so as to reach the position Y-6. The knit structure A forms an open stitch at the position Y-6 and progresses leftward by 1 course as a swing width of 1 wale, so as to reach the position Y-7. By using these as a repetition unit, the knit structure A is formed.

[0048] The movement of the reed at the time of knitting the insertion structure B (70B) can be represented by 11/33/11/ 22/00/22/. The knitting yarn of the insertion structure B (70B) is constituted by an elastic yarn. Examples of the elastic yarn used in the insertion structure B include spandex (elastic) yarns such as polyurethane yarns.

[0049] The insertion structure B progresses leftward from the position Y-1 by 1 course as a swing width of 2 wales, so as to reach the position Y-2. The insertion structure B progresses rightward from the position Y-2 by 1 course as a swing width of 2 wales, so as to reach the position Y-3. The insertion structure B progresses leftward from the position Y-3 by 1 course as a swing width of 1 wale, so as to reach the position Y-4.

[0050] The insertion structure B (70B) progresses rightward from the position Y-4 by 1 course as a swing width of 2 wales, so as to reach the position Y-5. The insertion structure B progresses leftward from the position Y-5 by 1 course as a swing width of 2 wales, so as to reach the position Y-6. By using these as a repetition unit, the insertion structure B is formed.

[0051] In the knit structure A (60A) of the first region 20 illustrated in FIG. 2, the knitting yarn is located at the positions X-1, X-2, X-3, X-4, X-5, X-6, . . . , on the courses at the position Y-1. At the position Y-1 in the insertion structure B (70B) of the first region 20, the knitting yarn is not arranged at the position X-1 on the course but at the position X-2 on the course. In the insertion structure B, the knitting yarn is arranged at the positions X-2, X-3, X-4, X-5, X-6, . . . , on the courses at the position Y-1.

[0052] The insertion structure B is formed such that the knitting yarns in courses adjacent to each other have counts different from each other. In the insertion structure B, elastic yarns are inserted such that the number of knitting yarns varies between the adjacent courses. For example, one elastic yarn is inserted in the insertion structure B at the positions X-2, X-4, and X-6 on the courses at the position Y-1. Two elastic yarns are inserted at the positions X-3 and X-5 on the courses at the position Y-1. In the courses (X-2, X-3) adjacent to each other, knitting two elastic yarns into one course (X-3) and one elastic yarn into the other course (X-2) sets the amount of elastic yarns in the other course (X-2) smaller than that in the one course (X-3).

[0053] In the first region 20, 6 blind laps are formed in one repetition unit (6 courses) of the same course without evasion laps. The elasticity of the knit fabric becomes greater as the number of evasion laps increases and smaller as the number of blind laps increases.

[0054] Power-Enhanced Part: Second Region

[0055] The second region 30 of the power-enhanced part 12 illustrated in FIGS. 4 and 5 has a knit structure A (nonelastic yarn: 61A) and an insertion structure B (elastic yarn: 70B).

[0056] FIG. 5 is a structural diagram illustrating the structures in the second region 30 in FIG. 4. In the movement of the reed at the time of knitting the knit structure A (61A), one repetition unit can be represented by 10/12/10/01/10/01/12/10/12/10/01/10/01/12/. The knitting yarn of the knit structure A is constituted by a nonelastic yarn. The knit structure A forms a loop each time it progresses by 1 course.

[0057] The knit structure A forms a closed stitch at the position Y-1 and progresses leftward by 1 course as a swing width of 1 wale, so as to reach the position Y-2. The knit structure A forms a closed stitch at the position Y-2 and progresses rightward by 1 course as a swing width of 1 wale, so as to reach the position Y-3. The knit structure A forms an open stitch at the position Y-3 and progresses by 1 course without moving in the wale direction, so as to reach the position Y-4.

[0058] The knit structure A forms an open stitch at the position Y-4 and progresses by 1 course without moving in the wale direction, so as to reach the position Y-5. The knit structure A forms an open stitch at the position Y-5 and progresses by 1 course as a swing width of 2 wales, so as to reach the position Y-6. The knit structure A forms an open stitch at the position Y-6 and progresses by 1 course without
moving in the wale direction, so as to reach the position Y-7. By using these as a repetition unit, the knit structure A is formed.

At the position Y-1 in the knit structure A (61A) of the second region 30 illustrated in FIG. 4, the knitting yarn is not arranged at the position X-1 on the course but at the position X-2 on the course. In the knit structure A, the knitting yarn is arranged at the positions X-2, X-3, X-4, X-5, X-6, . . . on the courses at the position Y-1. At the position Y-1 in the insertion structure B (70B) of the second region 30, the knitting yarn is not arranged at the position X-1 on the course but at the position X-2 on the course. In the insertion structure B, the knitting yarn is arranged at the positions X-2, X-3, X-4, X-5, X-6, . . . on the courses at the position Y-1.

In the second region 30, 4 blind laps and 2 evasion laps are formed in one repetition unit (6 courses) of the same course.

Power-Enhanced Part: Third Region

The third region 40 of the power-enhanced part 12 illustrated in FIGS. 6 and 7 has a knit structure A (nonelastic yarn: 62A) and an insertion structure B (elastice yarn: 70B).

FIG. 7 is a structural diagram illustrating the structures in the third region 40 in FIG. 6. The movement of the reed at the time of knitting the knit structure A (62A) can be represented by 32/12/32/01/21/01/. The knitting yarn of the knit structure A is constituted by a nonelastic yarn. The knit structure A forms a loop each time it progresses by 1 course.

The knit structure A forms an open stitch at the position Y-1 and progresses rightward by 1 course as a swing width of 1 wale, so as to reach the position Y-2. The knit structure A forms an open stitch at the position Y-2 and progresses leftward by 1 course as a swing width of 1 wale, so as to reach the position Y-3. The knit structure A forms an open stitch at the position Y-3 and progresses leftward by 1 course as a swing width of 2 wales, so as to reach the position Y-4.

The knit structure A forms an open stitch at the position Y-4 and progresses leftward by 1 course as a swing width of 1 wale, so as to reach the position Y-5. The knit structure A forms an open stitch at the position Y-5 and progresses rightward by 1 course as a swing width of 1 wale, so as to reach the position Y-6. The knit structure A forms an open stitch at the position Y-6 and progresses by 1 course without moving in the wale direction, so as to reach the position Y-7. By using these as a repetition unit, the knit structure A is formed.

At the position Y-1 in the knit structure A (62A) of the third region 40 illustrated in FIG. 6, the knitting yarn is arranged at the positions X-1, X-2, X-3, X-4, X-5, X-6, . . . on the courses at the position Y-1. At the position Y-1 in the insertion structure B (70B) of the third region 40, the knitting yarn is not arranged at the position X-1 on the course but at the position X-2 on the course. In the insertion structure B, the knitting yarn is arranged at the positions X-2, X-3, X-4, X-5, X-6, . . . on the courses at the position Y-1.

In the third region 40, 6 blind laps are formed in one repetition unit (6 courses) of the same course without evasion laps.

Power-Enhanced Part: Fourth Region

The fourth region 50 of the power-enhanced part 12 illustrated in FIGS. 8 and 9 has a knit structure A (nonelastic yarn: 63A) and an insertion structure B (elastic yarn: 70B).

FIG. 9 is a structural diagram illustrating the structures in the fourth region 50 in FIG. 8. In the movement of the reed at the time of knitting the knit structure A (63A), one repetition unit can be represented by 12/23/21/12/10/12/. The knitting yarn of the knit structure A is constituted by a nonelastic yarn. The knit structure A forms a loop each time it progresses by 1 course.

The knit structure A forms a closed stitch at the position Y-1 and progresses leftward by 1 course as a swing width of 1 wale, so as to reach the position Y-2. The knit structure A forms a closed stitch at the position Y-2 and progresses rightward by 1 course as a swing width of 1 wale, so as to reach the position Y-3. The knit structure A forms an open stitch at the position Y-3 and progresses by 1 course without moving in the wale direction, so as to reach the position Y-4.

The knit structure A forms a closed stitch at the position Y-4 and progresses rightward by 1 course as a swing width of 1 wale, so as to reach the position Y-5. The knit structure A forms a closed stitch at the position Y-5 and progresses leftward by 1 course as a swing width of 1 wale, so as to reach the position Y-6. The knit structure A forms an open stitch at the position Y-6 and progresses by 1 course without moving in the wale direction, so as to reach the position Y-7. By using these as a repetition unit, the knit structure A is formed.

At the position Y-1 in the knit structure A (63A) of the fourth region 50 illustrated in FIG. 8, the knitting yarn is not arranged at the position X-1 on the course but at the position X-2 on the course. In the knit structure A, the knitting yarn is arranged at the positions X-2, X-3, X-4, X-5, X-6, . . . on the courses at the position Y-1. At the position Y-1 in the insertion structure B (70B) of the fourth region 50, the knitting yarn is not arranged at the position X-1 on the course but at the position X-2 on the course. In the insertion structure B, the knitting yarn is arranged at the positions X-2, X-3, X-4, X-5, X-6, . . . on the courses at the position Y-1.

In the fourth region 50, 2 blind laps and 4 evasion laps are formed in one repetition unit (6 courses) of the same course.

A state where the knit fabric is relaxed will now be explained with reference to FIG. 10. FIG. 10 is a schematic view illustrating arrangements of yarns in the knit fabric in the relaxed state, in which FIGS. 10(a), 10(b), 10(c), and 10(d) represent the first, second, third, and fourth regions 20, 30, 40, 50, respectively.

In the state where the knit fabric is relaxed, the insertion structure B (elastic yarn, an example of which is a polyurethane yarn) which was in a stretched state at the time of knitting draws in the knit structure A (nonelastic yarn) so as to return to its original form (linear form) as illustrated in FIG. 10. This causes the insertion structure B to form waves linearly. Knitting yarns traveling between the waves are jacquard yarns, which are nonelastic yarns of the knit structure A. In the fourth region 50 illustrated in FIG. 10(d), the nonelastic yarn of the knit structure A (63A) moves along the elastic yarn of the insertion structure B (70B).

In general, the feed rate of a yarn supplied from a beam corresponding to each reed is set according to the knit structure knitted by the reed. Here, yarns having the same length are uniformly wound about respective beams.

Therefore, in the knitting of the knit fabric 10, the Jacquard yarns (nonelastic yarns of the knit structure A) are supplied at the same feed rate by the beams.

When drawing a design which can be expressed by Jacquard weaving (figured textile), amounts of delivery of
individual yarns are hard to change even when the yarns are knitted in different movements. Therefore, when a large amount of yarns is needed in Jacquard weaving, the Jacquard yarns may be in short supply, whereby the knit fabric may be squeezed or tightened.

In FIG. 10, the amount of Jacquard yarns traveling between the wales is the largest in the third region 40 and the smallest in the fourth region 50. Therefore, wale intervals are squeezed and narrowed in the third region 40, whereas there is no sinker loop passage in the fourth region 50 so that its wale intervals become wider. Consequently, it is seen from FIG. 10 that the third region 40, first region 20, second region 30, and fourth region 50 are in descending order of the power of the knit fabric.

In FIG. 10, a broken line indicates the insertion structure B formed by one elastic yarn, whereas a solid line indicates the insertion structure B formed by two elastic yarns. The insertion structure B formed by one elastic yarn uses an elastic yarn of 310 denier, for example, whereas the insertion structure B formed by two elastic yarns uses two yarns of 310 denier, for example. In the insertion structure B (70B), one elastic yarn and a bundle of two elastic yarns are alternately arranged in the respective courses.

Thus, in the knit fabric 10 in accordance with this embodiment, elastic yarns of the insertion structure B (70B) are inserted such that the total thickness (which can also be expressed as the cross-sectional area) of elastic yarns varies between the courses adjacent to each other. When producing the knitted fabric 10, elastic yarns under tension are knitted into elastic yarns serving as knitting yarns. At this time, since the thickness of elastic yarns varies between the adjacent courses, a difference occurs between the amounts of stretch of the elastic yarns in the adjacent courses during knitting.

The thicker elastic yarn (the course having the thicker yarn) is knitted in a state where a higher tension acts on the elastic yarn than the thinner elastic yarn. After the lapse of a predetermined time from the knitting of the knit fabric 10, the forces of the elastic yarns are in balance with each other, whereby the knit fabric 10 is relaxed. Consequently, in the relaxed state, the thinner yarn is pulled by the greater resilience of the thicker elastic yarn, whereby the knit fabric is stabilized under some tension. This produces a difference between repulsive forces of the elastic yarns for each pair of adjacent courses in the knit fabric 10 in the relaxed state, so that a power is likely to occur in the thinner elastic yarn alone.

In this knit fabric 10, at the beginning of stretching, a power can be generated in the thinner elastic yarn but not in the thicker elastic yarn, whereby a relatively mild power can be produced. That is, as the amount of stretch of the knit fabric 10 increases, a power occurs in the thinner yarn at the beginning and gradually arises in the thicker elastic yarn. As a result, a relatively mild power can be generated at the beginning of stretching of the knit fabric 10, and then the power can be enhanced gradually. The power difference between the base part 11 and power-enhanced part 12 can be changed in the knitted fabric 10.

The course having two elastic yarns can catch the reed more strongly than the course having one elastic yarn, whereby a greater difference can be produced between tensions acting on the elastic yarns at the time of knitting the knit fabric 10. This can increase the change in power difference in the knit fabric 10.

The power-enhanced part 12 of the knit fabric 10 is formed with a plurality of regions having different knit structures in the course direction. Thus altering the knit structure in the course direction can provide a power difference within the power-enhanced part 12. By changing the combination (ratios) of evasion laps and blind laps in a plurality of regions, the knit fabric 10 varies its elasticity. While this embodiment sets forth an example in which the power-enhanced part 12 is knitted in a part of the knit fabric 10, the present invention is not limited thereto. For example, the knit fabric 10 as a whole may be knitted by the power-enhanced part 12.

**Second Embodiment**

The stretchable warp knit fabric for clothes in accordance with the second embodiment of the present invention will now be explained. The same explanations as those of the above-mentioned embodiment will be omitted. FIG. 11 is a front view of the stretchable warp knit fabric for clothes in accordance with the second embodiment of the present invention. The knit fabric 10B of the second embodiment illustrated in FIG. 11 differs from the knit fabric 10 of the first embodiment illustrated in FIG. 1 in the arrangement of regions 20, 30, 40, 50 in the power-enhanced part 12.

In the power-enhanced part 12 of the second embodiment, a third region 40 is formed in a V shape along the lower side of a second region 30 having a substantially triangular form. Fourth regions 50, each having an elliptical form, are arranged within the third region 40. A first region 20 is formed into a substantially rhombic form. A second region 30 or base part 11 is formed like a band along edges of the first region 20. On the outside of the band-like second region 30 and base part 11, a first region 20 is arranged so as to form a substantially rhombic frame corresponding to the form of the first region 20 at the center. Similarly, on the outer side, first regions 20 are arranged while interposing band-like second regions 30 and base parts 11 so as to form substantially rhombic frames.

The knit fabric 10B of the second embodiment like this also exhibits the same operations and effects as those of the knit fabric 10 of the first embodiment.

**Third Embodiment**

A bottom garment (girdle) in accordance with the third embodiment of the present invention will now be explained. The same explanations as those of the above-mentioned embodiments will be omitted. FIG. 12 is a perspective view illustrating the girdle in accordance with the third embodiment of the present invention as seen from the front side.

The girdle 210 (bottom garment) illustrated in FIG. 12 has a body part 211 for covering the lower body of a wearer. An upper end part 212 of the body part 211 is a waist finish formed by a rubber material which stretches well or the like. The upper end part 212 forms a portion of a waist part corresponding to the waist of the wearer.

The girdle 210 employs the knit fabric 10B (10) stated in the above-mentioned embodiment as a fabric for the body part 211. The power-enhanced part 12 is arranged at the center on the front face of the girdle 210. The power-enhanced part 12, which is a replacement for a conventionally known tummy structure of a girdle, is constituted by a single knitted fabric. The conventional tummy structure for the girdle has produced power differences by sewing a plurality of fabrics (panels) together.
The girdle 210 in accordance with this embodiment, in which the power-enhanced part 12 is formed by the single knit fabric 10, makes it unnecessary to sew a plurality of fabrics together and thus can cut down man-hours during manufacture. As a result, the manufacturing cost can be suppressed. Cutting down the man-hours can also improve quality.

Since the girdle 210 employs the knit fabric 10, when the girdle 210 is worn, a relatively mild power can be generated and then gradually enhanced. Therefore, a comfortable power to wear can be felt depending on the wearer. The girdle 210 can generate a mild power when started wearing and produce a power securely so as to correct the figure of the wearer favorably. The power-enhanced part 12 inhibits a part coming into close contact therewith from bulging outward and thus can correct the figure of the wearer.

In the girdle 210, the upper side of the second region 30 arranged like an inverted triangle in the power-enhanced part 12 forms a portion of the waist part. Arranging the second region 30, which has a power weaker than that of the first region 20, at the waist part enables the waist part to stretch favorably.

While the girdle 210 in accordance with the above-mentioned embodiment has the power-enhanced part 12 arranged on the front side, girdles may have the power-enhanced part 12 formed on other parts, examples of which include flanks and the back side. A bottom garment may have the power-enhanced part 12 formed in a part corresponding to thighs of the wearer. The bottom garment is not limited to the girdles but may be leggings and the like.

Fourth Embodiment

A waist nipper (tubular garment) in accordance with the fourth embodiment of the present invention will now be explained. The same explanations as those of the above-mentioned embodiments will be omitted. FIG. 13 is a front view of the waist nipper in accordance with the fourth embodiment. The waist nipper 400 is a corrective garment which corrects the figure about the waist. In the waist nipper 400 of this example, a body part 401 (main body) is formed so as to cover an area extending from the bust under the body about the waist.

The waist nipper 400 employs the knit fabric 103 (10) stated in the above-mentioned embodiment as a fabric for the body part 401. The power-enhanced part 12 is arranged at the center on the front face of the waist nipper 400.

The waist nipper 400 like this can correct the protrusion of the abdomen of the wearer. The position of the power-enhanced part 12 can be changed according to specifications of the tubular garment. More specifically, the power-enhanced part 12 may be provided only in left and right flanks, parts extending from the back center to the left and right flanks, and other parts where flab is likely to bulge in the worn state. In this case, the correcting force of the body part 401 can smooth the bulged flab, so that a silhouette in the worn state becomes a smoother curve.

This embodiment is explained as a waist nipper by way of example but can be applied to other tubular garments, examples of which include socks, stockings, supporters, bodysuits, and swimsuits. By the tubular garment is meant a garment having a tubular part.

The present invention is explained specifically according to its embodiments in the foregoing, but is not limited to the above-mentioned embodiments. For example, the power-enhanced part may be constituted by a plurality of regions having different knit structures or a single knit structure.

The stretchable warp knit fabric for clothes in accordance with the present invention is not limited to those used in bottom garments and tubular garments, but may be applied to other garments. For example, the stretchable warp knit fabric for clothes in accordance with the present invention may be applied to a part of an upper body garment, a garment having cups, and the like.

While a course having two elastic yarns inserted therein and a course having one elastic yarn inserted therein are arranged alternately in the above-mentioned embodiments, other arrangements may be employed. For example, a course having three elastic yarns inserted therein and a course having one elastic yarn inserted therein may be arranged alternately. A course having three elastic yarns inserted therein, a course having two elastic yarns inserted therein, and a course having one elastic yarn inserted therein may be arranged in sequence.

The amount of elastic yarns, which is changed by varying the number of elastic yarns between courses adjacent to each other in the above-mentioned embodiments, may be changed by varying the thickness of yarns (cross-sectional area of elastic yarns) while using the same number of yarns.

The repetition unit of the knit fabric, which is constituted by 6 courses in the above-mentioned embodiments, may be constituted by 5 courses or less or 7 courses or more.

INDUSTRIAL APPLICABILITY

The present invention can produce a relatively mild power at the beginning of stretching of a knit fabric and increase the power in the middle, so as to improve elasticity in the lateral direction.

REFERENCE SIGNS LIST

10, 103: fabric (stretchable warp knit fabric for clothes)
11: base part (main knit fabric)
12: power-enhanced part (power-enhanced knit fabric)
20: first region (power-enhanced knit fabric)
30: second region (power-enhanced knit fabric)
40: third region (power-enhanced knit fabric)
50: fourth region (power-enhanced knit fabric)
60A, 61A, 62A, 63A: knit structure A (nonelastic yarn)
70B: insertion structure B (elastic yarn)
210: girdle (bottom garment)
400: waist nipper (tubular garment)

1. A stretchable warp knit fabric for clothes, the warp knit fabric being employable for garments and formed so as to come into close contact with a skin by being stretched upon wearing;

at least a part of the warp knit fabric including a power-enhanced knit fabric having one course and the other course adjacent to each other, an amount of an elastic yarn for the other course being set smaller than that for the one course so that the elastic yarn knitted into the other course is stretched by a resilience of the elastic yarn knitted into the one course contracting from a stretched state when being knitted.
2. A stretchable warp knit fabric for clothes according to claim 1, comprising:
   a main knit fabric; and
   the power-enhanced knit fabric having a power higher than that of the main knit fabric;
   wherein the power-enhanced knit fabric has elastic yarns knitted therein so as to have respective thicknesses different from each other in courses adjacent to each other.

3. A stretchable warp knit fabric for clothes according to claim 1, wherein the power-enhanced knit fabric has the elastic yarns knitted therein such that the number of yarns varies between the courses adjacent to each other.

4. A stretchable warp knit fabric for clothes according to claim 1, wherein the power-enhanced knit fabric is constructed such that a course having two such elastic yarns inserted therein and a course having one such elastic yarn inserted therein are adjacent to each other.

5. A stretchable warp knit fabric for clothes according to claim 1, wherein the power-enhanced knit fabric changes the power of the knit fabric by altering a knit structure in a direction of the courses.

6. A bottom garment comprising the stretchable warp knit fabric for clothes according to claim 1, wherein the power-enhanced knit fabric of the stretchable warp knit fabric for clothes is adapted to come into close contact with a front of an abdomen of a wearer.

7. A tubular garment comprising the stretchable warp knit fabric for clothes according to claim 1, wherein the power-enhanced knit fabric of the stretchable warp knit fabric for clothes is adapted to come into close contact with a front of an abdomen of a wearer.

8. A method for manufacturing a stretchable warp knit fabric for clothes, the warp knit fabric being employable for garments and formed so as to come into close contact with a skin by being stretched upon wearing:
   the method comprising knitting at least a part of the warp knit fabric including a power-enhanced knit fabric having one course and the other course adjacent to each other such that an amount of an elastic yarn for the other course is set smaller than that for the one course so that the elastic yarn knitted into the other course is stretched by a resilience of the elastic yarn knitted into the one course contracting from a stretched state when being knitted.