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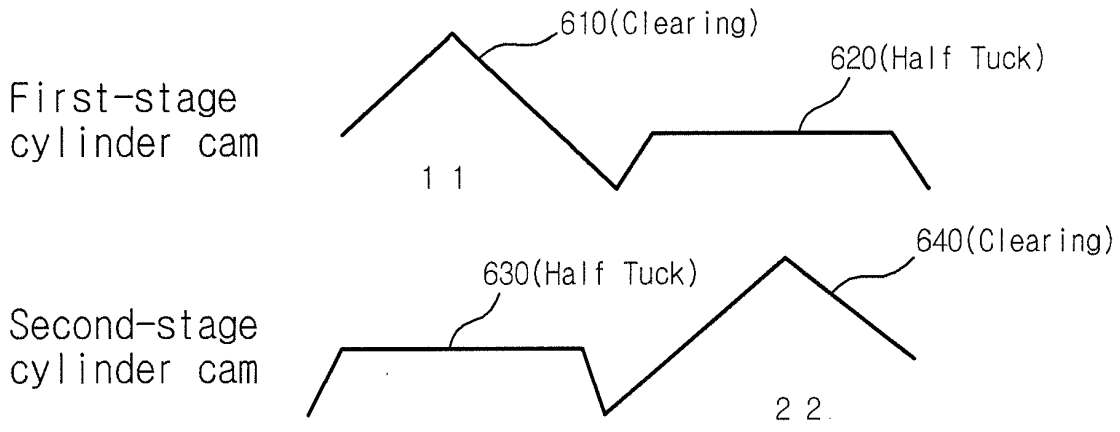
(54) METHOD FOR WEAVING SINGLE FABRIC AND SINGLE FABRIC WOVEN THEREBY

(57) The present invention relates to a method for weaving a single fabric, the method comprising: alternately forming a clearing position and a half-tuck position at a first-stage cylinder cam; and forming a half-tuck position and a clearing position at a second-stage cylinder cam formed under the first-step cylinder cam, wherein the half-tuck position of the second-stage cylinder cam is positioned under the clearing position of the first-stage cylinder cam, and the clearing position of the second-stage cylinder cam is positioned under the half-tuck position of the first-stage cylinder cam, and wherein a non-covered yarn is supplied to the clearing position of the first-stage cylinder cam, and a covered yarn is supplied to the half-tuck position of the first-stage cylinder cam.

Fig. 2



EP 3 453 792 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a method for weaving a single fabric and a single fabric woven thereby, and more particularly, to a method for weaving a single fabric in which a non-covered yarn protrudes upwards and a covered yarn is tucked downwards so that a fraise effect can be exhibited when viewed from a cross-section or a front using a special yarn such as a slub yarn or a nap yarn and general yarns such as the non-covered yarn and the covered yarn, and to a single fabric woven thereby.

BACKGROUND ART

[0002] In general, the kind of a fabric is classified variously depending on weaving pattern and thickness, and flexibility, and examples of the kind of the fabric which is widely known include single, fraise, chirimen, and the like.

[0003] The single fabric can commonly be found in underwear or T-shirts, and is flexible in the transverse direction.

[0004] In addition, the fraise fabric is a fabric which is similar to the single fabric, but is very good in flexibility. It is a fabric which is low in elasticity that allows the fabric to return to its original position when it is stretched and then is released.

[0005] The fraise fabric is a fabric which has the same weaving pattern on the front and rear surfaces thereof, and can be found most frequently in children's underwear or baby goods.

[0006] The chirimen fabric is a fabric which can be found most frequently in hood T-shirts or zip-up jumpers for autumn and winter seasons.

[0007] In the meantime, a fabric knitted in the fraise manner in a circular knitting machine has a shape in which concavo-convex patterns are repeatedly formed on the top and bottom surfaces of the fabric.

[0008] A general ring yarn can be woven in the fraise pattern, but the special yarn such as the slub yarn or the nap yarn involves a problem in that it cannot be woven in the fraise pattern in terms of textural properties, making it impossible to provide a fabric with excellent flexibility.

DISCLOSURE OF INVENTION

TECHNICAL PROBLEM

[0009] Accordingly, the present invention has been made in order to solve the above-described problems occurring in the prior art, and it is an object of the present invention is to provide a method for weaving a single fabric, which can provide a fabric with excellent flexibility using a special yarn such as a slub yarn or a nap yarn, and a single fabric woven by the method.

TECHNICAL SOLUTION

[0010] To achieve the above object, in one aspect, the present invention provides a method for weaving a single fabric, the method including: alternately forming a clearing position and a half-tuck position at a first-stage cylinder cam; and forming a half-tuck position and a clearing position at a second-stage cylinder cam formed under the first-step cylinder cam, wherein the half-tuck position of the second-stage cylinder cam is positioned under the clearing position of the first-stage cylinder cam, and the clearing position of the second-stage cylinder cam is positioned under the half-tuck position of the first-stage cylinder cam, and wherein a non-covered yarn is supplied to the clearing position of the first-stage cylinder cam, and a covered yarn is supplied to the half-tuck position of the first-stage cylinder cam.

[0011] In the method for weaving a single fabric, a plurality of first needles may be moved along the first-stage cylinder cam while forming a pair, and a plurality of second needles may be moved along the second-stage cylinder cam while forming a pair.

[0012] In the method for weaving a single fabric, the supplied yarn is may be caught on the needles at the clearing positions, but the supplied yarn may pass through the needles in a state of not being caught on the needles at the half-tuck positions.

[0013] To achieve the above object, in another aspect, the present invention provides a single fabric woven by a method for weaving a single fabric, the method including: alternately forming a clearing position and a half-tuck position at a first-stage cylinder cam; and forming a half-tuck position and a clearing position at a second-stage cylinder cam formed under the first-step cylinder cam, wherein the half-tuck position of the second-stage cylinder cam is positioned under the clearing position of the first-stage cylinder cam, and the clearing position of the second-stage cylinder cam is positioned under the half-tuck position of the first-stage cylinder cam, and wherein a non-covered yarn is supplied to the clearing position of the first-stage cylinder cam, and a covered yarn is supplied to the half-tuck position of the first-stage cylinder cam.

ADVANTAGEOUS EFFECTS

[0014] The method for weaving a single fabric and a single fabric woven thereby according to the present invention has an advantageous effect in that a convex portion is formed only at one side based on a covered yarn, thereby exhibiting an effect of giving a superior wearing feeling, compared to a fabric woven by a conventional fraise method.

[0015] In addition, the pattern shapes of the front surface and the rear surface of the single fabric woven by the inventive single fabric weaving method are different from each other, thereby exhibiting an effect in that **the single fabric** woven by the method can be used as a

material for making a reversible garment that can be worn upside down.

[0016] Further, when a fabric is woven in the fraise manner, it has a weight of 400 g per yard whereas the single fabric woven by the inventive single fabric weaving method is made lightweight (i.e., 250 g per yard), resulting in a lightweightness and a reduction in the manufacturing cost.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The above and other objects, features and advantages of the present invention will be apparent from the following detailed description of the preferred embodiments of the invention in conjunction with the accompanying drawings, in which:

FIG. 1 is a schematic view showing main parts of a knitting unit of a single circular knitting machine used in the present invention;
FIG. 2 is a schematic conceptual view showing a structure of a cylinder cam of the present invention;
FIG. 3 is a schematic, cross-sectional view showing a cross section of a fabric woven by the single fabric weaving method of the present invention; and
FIG. 4 is a photograph showing a fabric woven by the single fabric weaving method of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

[0018] Hereinafter, the preferred embodiments of the present invention will be described in further detail with reference to the accompanying drawings. It will be easily understood by a person of ordinary skill in the art that the accompanying drawings are merely illustrated to more easily describe the spirit of the present invention, but they do not limit the scope of the present invention.

[0019] In addition, in the following description, the same reference numerals are used for the same elements in different drawings, and thus an additional description thereof will be omitted.

[0020] Moreover, the terms used herein are intended to merely describe specific embodiments, but not intended to limit the scope of the present invention. As used herein, the singular forms "a," "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises," "comprising," "includes", "including, "has" and/or "having" when used herein, specify the presence of stated features, integers, steps, operations, elements, components, and/or combinations thereof, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or combinations thereof.

[0021] FIG. 1 is a schematic view showing main parts of a knitting unit of a single circular knitting machine used in the present invention.

[0022] A single circular knitting machine used in the single fabric weaving method of the present invention includes a cylinder 100, a yarn carrier 200, a cam holder 110, and a sinker cam unit 300.

[0023] The cylinder 100 has a plurality of needle grooves formed on an outer circumference thereof so that a cylinder needle 400 is slidingly moved vertically along the needle grooves.

[0024] A sinker dial 310 is firmly attached to an upper portion of the cylinder 100, and has a plurality of sinker grooves formed on the top thereof so that a sinker 500 slides freely radially along the sinker grooves. A sinker cam 501 is mounted on the underside of one side of the sinker cam unit 300 so as to control the sinker 500.

[0025] The cylinder 100 is rotated at the same speed as that of a driving device 600 mounted at a bottom portion thereof , and the yarn carrier 200 is intended to supply a yarn to the cylinder needle 400. A cylinder cam (C-CAM) 20 for controlling the cylinder needle 400 is mounted at one side wall of the cam holder 110.

[0026] The cylinder cam is formed as a two-stage structure composed of a first-stage cylinder cam formed at an upper portion of the one side wall of the cam holder 110 and a second-stage cylinder cam positioned below the first-stage cylinder cam. A first needle is positioned at the first-stage cylinder cam and a second needle is positioned at the second-stage cam.

[0027] FIG. 2 is a schematic conceptual view showing a structure of a cylinder cam of the present invention, FIG. 3 is a schematic cross-sectional view showing a cross section of a fabric woven by the single fabric weaving method of the present invention, and FIG. 4 is a photograph showing a fabric woven by the single fabric weaving method of the present invention.

[0028] The cylinder cam of the present invention has a structure in which a clearing position 610 and a half-tuck position 620 are alternately formed at the first-stage cylinder cam, and a half-tuck position 630 and a clearing position 640 are formed at the second-stage cylinder cam as shown in FIG. 2.

[0029] In addition, the half-tuck position 630 of the second-stage cylinder cam is positioned under the clearing position 610 of the first-stage cylinder cam, and the clearing position 640 of the second-stage cylinder cam is positioned under the half-tuck position 620 of the first-stage cylinder cam.

[0030] The supplied yarn is caught on the needles at the clearing positions 610 and 640, but the needles pass through the half-tuck positions 620 and 630 in a state in which the supplied yarn is not caught on the needles at the half-tuck positions 620 and 630.

[0031] A yarn applied to the present invention is classified into two types: one is a nap yarn, a slub yarn, or a non-covered yarn as a general yarn, and the other is a covered yarn.

[0032] The nap yarn is a yarn in which a basic thread and a mass of fiber with different colors or a mass of cotton are sparsely blended together, and the slub yarn

is a yarn which has either partially thicker areas along its length to have a small number of twists or substantially untwisted areas along its length.

[0033] In addition, the covered yarn is a uniform yarn in which the length of fiber is short but is relatively smooth and creates less fluff compared to other spun yarns. The covered yarn mostly has a cotton count of 10 to 60 in terms of its thickness.

[0034] In the present invention, two first needles are moved along the first-stage cylinder cam while forming a pair, and two second needles are moved along the second-stage cylinder cam while forming a pair.

[0035] A non-covered yarn is supplied to the clearing position 610 of the first-stage cylinder cam, and a covered yarn is supplied to the half-tuck position 629 of the first-stage cylinder cam.

[0036] Thus, the non-covered yarn is supplied to the half-tuck position 630, and the covered yarn is supplied to the clearing position 640 in the second-stage cylinder cam.

[0037] A single fabric weaving method according to the present invention will be described below.

[0038] When two first needles are supplied with a non-covered yarn while passing through the clearing position 610 of the first-stage cylinder cam, the non-covered yarn is caught on the two first needles to form a loop and create a flexible portion in terms of the properties of the non-covered yarn. On the contrary, when the two first needles pass through the half-tuck position 620, they are supplied with the covered yarn but pass through the half-tuck position 620 in which the supplied covered yarn is not caught on the first needles.

[0039] In addition, when two second needles pass through the half-tuck position 630, they are supplied with the non-covered yarn but pass through the half-tuck position 630 in which the supplied non-covered yarn is not caught on the second needles. On the contrary, when the two second needles pass through the clearing position 640, they are supplied with the covered yarn and the covered yarn is caught on the two second needles to form a loop and create a non-flexible portion in terms of the properties of the covered yarn.

[0040] The cross section of a single fabric woven as described above is as shown in FIG. 3, and the non-covered yarn forms a convex portion 720 to give a feeling of volume but the covered yarn is tucked downwards to form a flat portion 710.

[0041] If necessary, the first needles may be modified such that three or more first needles form a pair, and the second needles may be modified such that three or more first needles form a pair.

[0042] In addition, the first needles and the second needles may be configured such that the number of the first needles constituting a pair is different from the number of the second needles constituting a pair.

[0043] The single fabric woven by the single fabric weaving method of the present invention has a textural pattern as shown in FIG. 4.

[0044] The method for weaving a single fabric and the single fabric woven thereby according to the present invention have an advantageous effect in that a convex portion is formed only at one side based on a covered yarn, thereby exhibiting an effect of giving a superior wearing feeling, compared to a fabric woven by a conventional fraise method.

[0045] In addition, the pattern shapes of the front surface and the rear surface of the yarn woven by the inventive single fabric weaving method are different from each other, thereby exhibiting an effect in that the yarn woven by the method can be used as a material for making a reversible garment that can be worn reversibly.

[0046] Further, when a fabric is woven in the fraise manner, it has a weight of 400 g per yard whereas the single fabric woven by the inventive single fabric weaving method is made lightweight (i.e., 250 g per yard), resulting in a lightweightness and a reduction in the manufacturing cost.

[0047] While the specific exemplary embodiments according to the present invention have been described and illustrated with reference to the accompanying drawings, it will be obvious to those skilled in the art that the present invention can be embodied in other specific forms without departing from the spirit or scope thereof. The presently disclosed embodiments are therefore considered in any respects to be illustrative but not restrictive. The scope of the invention is defined by the appended claims rather than the foregoing description, and all changes which fall within the meaning and range of equivalents thereof are intended to be embraced therein.

Claims

1. A method for weaving a single fabric, the method comprising:

   alternately forming a clearing position and a half-tuck position at a first-stage cylinder cam; and
   forming a half-tuck position and a clearing position at a second-stage cylinder cam formed under the first-step cylinder cam,
   wherein the half-tuck position of the second-stage cylinder cam is positioned under the clearing position of the first-stage cylinder cam, and the clearing position of the second-stage cylinder cam is positioned under the half-tuck position of the first-stage cylinder cam, and
   wherein a non-covered yarn is supplied to the clearing position of the first-stage cylinder cam, and a covered yarn is supplied to the half-tuck position of the first-stage cylinder cam.

2. The method according to claim 1, wherein a plurality of first needles is moved along the first-stage cylinder cam while forming a pair, and
   wherein a plurality of second needles is moved along

the second-stage cylinder cam while forming a pair.

3. The method according to claim 1 or 2, wherein the supplied yarn is caught on the needles at the clearing positions, but the needles pass through the half-tuck positions in a state in which the supplied yarn is not caught on the needles at the half-tuck positions.

4. A single fabric woven by a method for weaving a single fabric, the method comprising:

alternately forming a clearing position and a half-tuck position at a first-stage cylinder cam; and
forming a half-tuck position and a clearing position at a second-stage cylinder cam formed under the first-step cylinder cam,
wherein the half-tuck position of the second-stage cylinder cam is positioned under the clearing position of the first-stage cylinder cam, and the clearing position of the second-stage cylinder cam is positioned under the half-tuck position of the first-stage cylinder cam, and
wherein a non-covered yarn is supplied to the clearing position of the first-stage cylinder cam, and a covered yarn is supplied to the half-tuck position of the first-stage cylinder cam.

Fig. 1

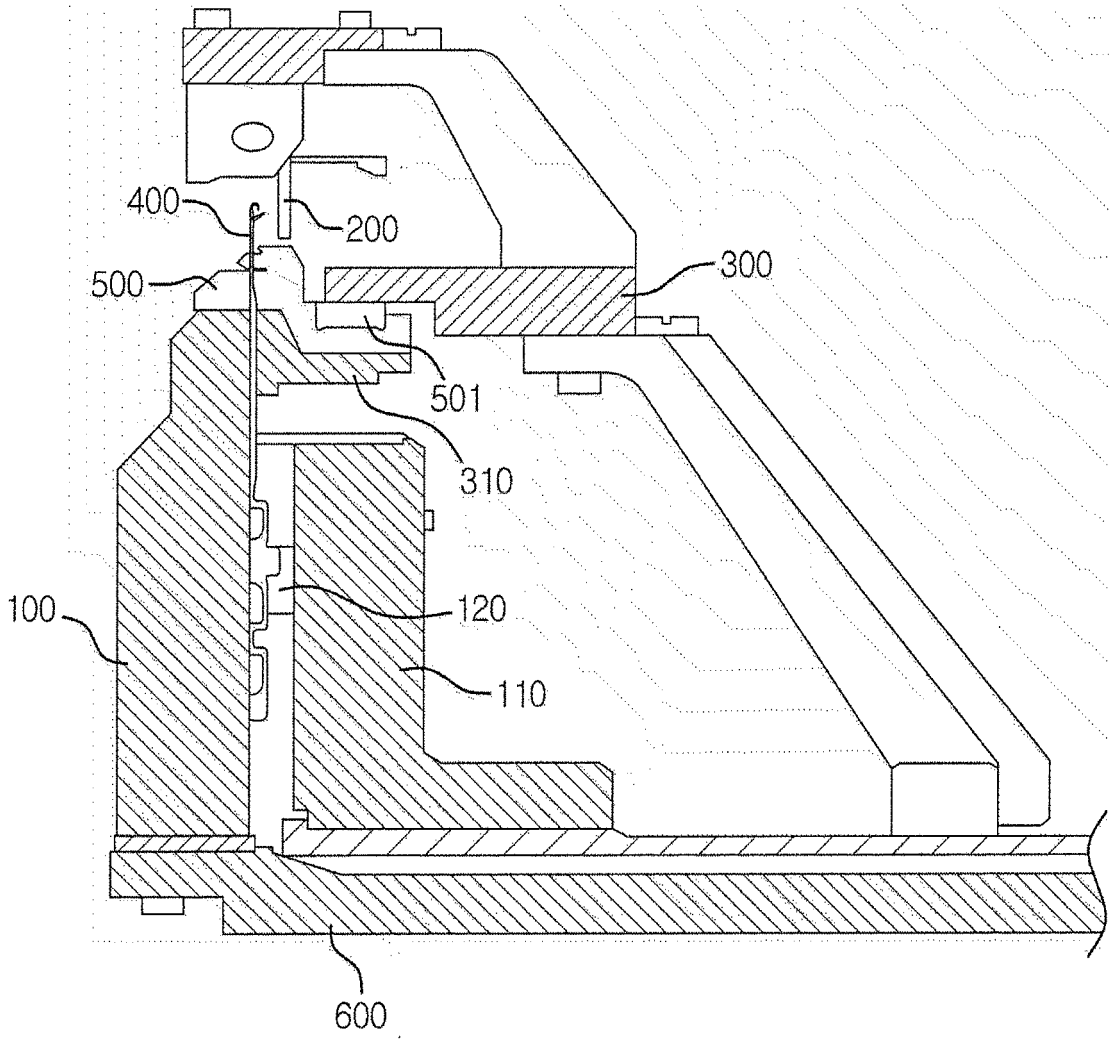

400
200
500
300
501
310
100
120
110
600

Fig. 2

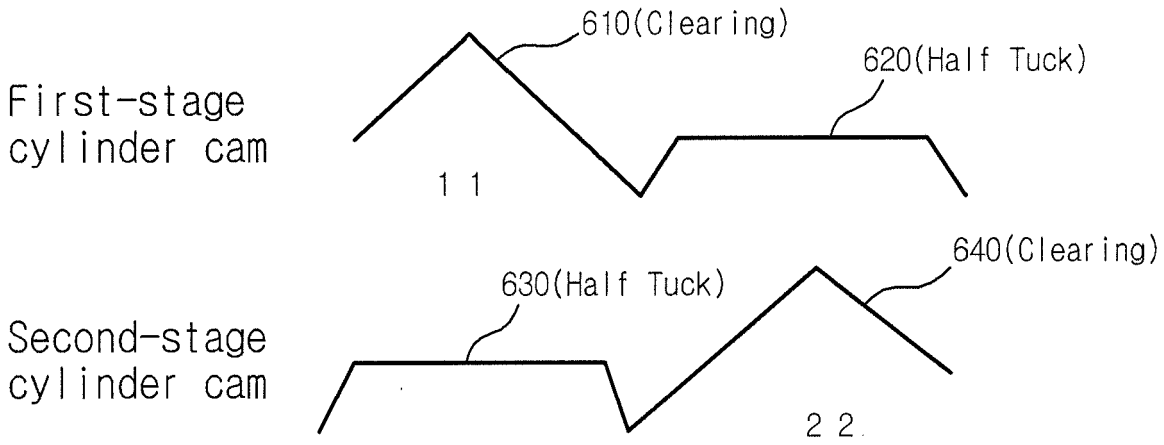

First-stage cylinder cam
610(Clearing)
620(Half Tuck)
1 1
Second-stage cylinder cam
630(Half Tuck)
640(Clearing)
2 2

Fig. 3

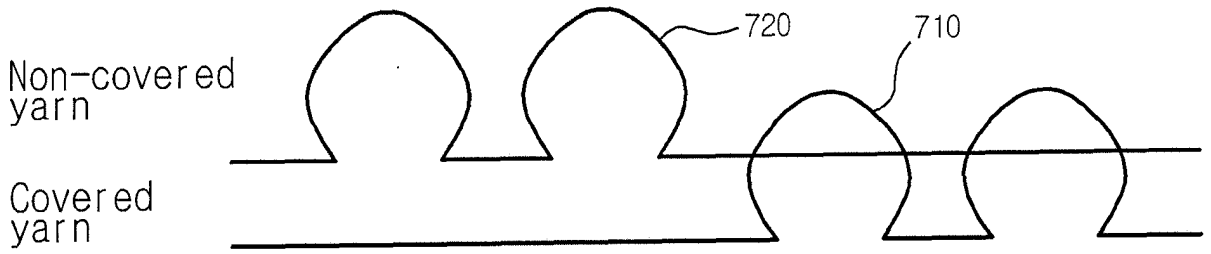
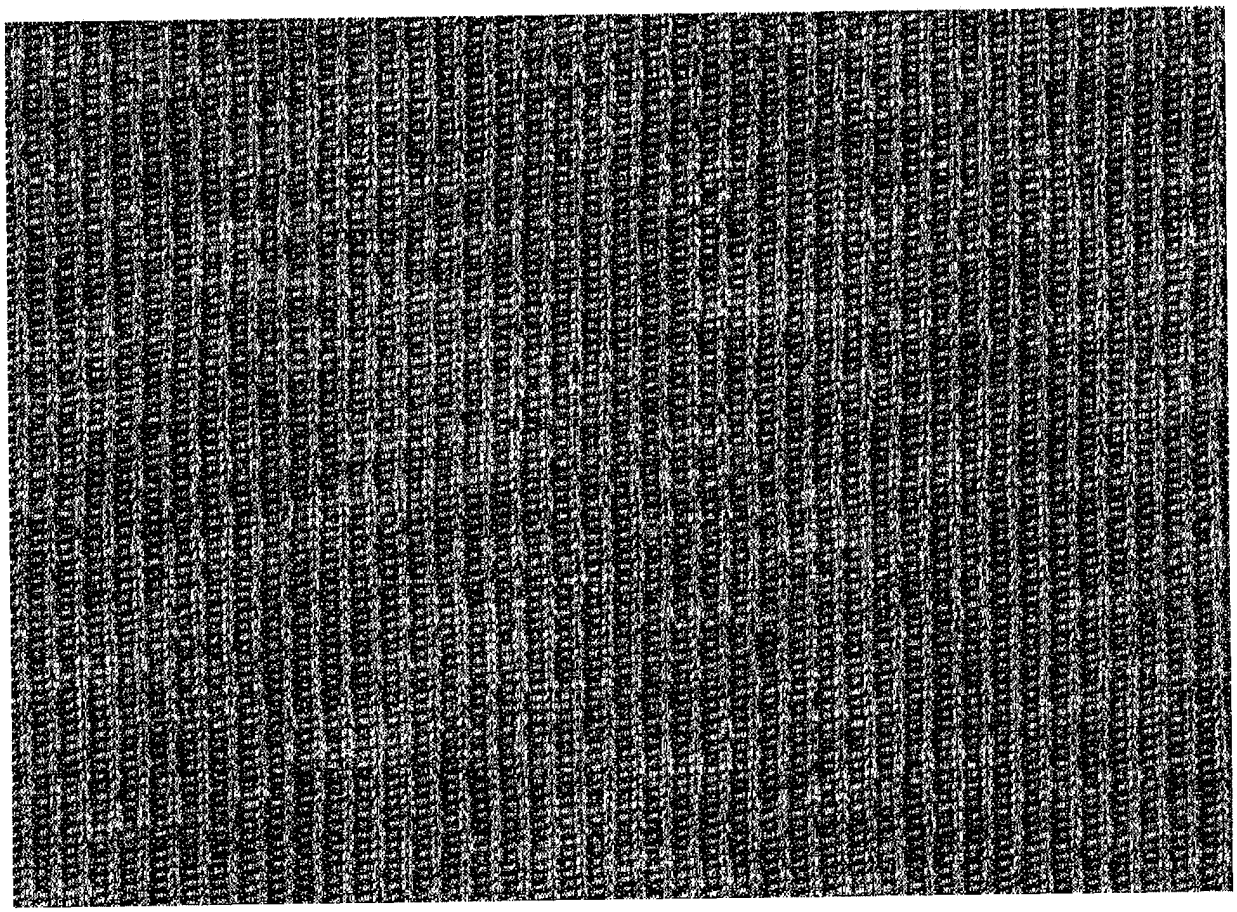


Fig. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2016/014454

A. CLASSIFICATION OF SUBJECT MATTER
D04B 9/26(2006.01)i, D04B 9/42(2006.01)i, D04B 1/10(2006.01)i, D04B 1/24(2006.01)i, D04B 9/06(2006.01)i, D04B 15/32(2006.01)i
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D04B 9/26; D04B 21/02; D04B 15/82; D04B 15/58; D04B 15/32; D04B 1/02; D04B 1/04; D04B 21/04; D04B 9/42; D04B 1/10; D04B 1/24; D04B 9/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models: IPC as above
Japanese Utility models and applications for Utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS (KIPO internal) & Keywords: half tuck, half tuck, clearing, cylinder cam, single fabric, covering yarn, weaving

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 08-100353 A (UNITIKA LTD.) 16 April 1996 See claim 1; and figure 1.	4
A		1-3
A	KR 10-2006-0135261 A (LEE, Jae-Dong) 29 December 2006 See the entire document.	1-4
A	KR 10-2004-0097117 A (N.I.TEIJIN SHOJI CO., LTD.) 17 November 2004 See the entire document.	1-4
A	KR 10-0981060 B1 (HANATECH. CO., LTD.) 08 September 2010 See the entire document.	1-4
A	KR 10-1035542 B1 (LEE, Sung Il) 23 May 2011 See the entire document.	1-4

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 APRIL 2017 (07.04.2017)	**11 APRIL 2017 (11.04.2017)**

Name and mailing address of the ISA/KR	Authorized officer
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2016/014454

Patent document cited in search report	Publication date	Patent family member	Publication date
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KR 10-1035542 B1	23/05/2011	NONE	

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