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(54) WOVEN OR KNITTED FABRIC

(57) There is provided a technology with which mold processability can be imparted to even a woven and knitted fabric containing natural fibers or regenerated fibers having no thermoplasticity, and with which even a woven and knitted fabric containing thermoplastic fibers having low heat resistance, such as nylon or polypropylene, shows no yellowing or hardening after processing with the result that a light-colored fabric can also be subjected to mold processing.

A woven and knitted fabric according to an embodiment of the present invention includes a yarn containing elastic fibers and at least one kind of non-elastic fibers. The woven and knitted fabric is subjected to mold processing. The elastic fibers contain heat-fusible polyurethane elastic filaments each having a fineness of 17 dtex or more, and at least part of the heat-fusible polyurethane elastic filaments is heat-fused in the woven and knitted fabric. The woven and knitted fabric is subjected to the mold processing at 120 to 190°C.

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Description

Technical Field

[0001] The present invention relates to a woven and knitted fabric subjected to mold processing. In particular, the present invention relates to a woven and knitted fabric having imparted there to satisfactory mold processability through use of heat-fusible polyurethane elastic filaments.

Background Art

[0002] There is known an approach to imparting mold processability to a woven fabric or a knitted fabric by providing the fabric with thermoplastic fibers. JP 2001-98446 A (Patent Literature 1) discloses a technology for mold processing, involving using polyurethane elastic filaments each having a high heat setting rate. JP 2006-225817 A (Patent Literature 2) discloses a technology for mold processing, involving using polyurethane elastic filaments and nylon fibers.

[0003] However, it cannot be said that any of the technologies is sufficient in actual mold processability. In addition, according to such technology, the mold processing is performed by applying excessive heat, and hence thermoplastic fibers of a face yarn harden. As a result, the woven fabric or knitted fabric to be obtained is poor in fabric feeling and takes on a shine in some cases.

[0004] In the technology described in Patent Literature 2, it is assumed that, when a woven and knitted fabric containing elastic fibers (polyurethane elastic filaments) is subjected to the mold processing, synthetic fibers (e.g. nylon or polyester) having high thermoplasticity are mixed and used in the face yarn and the processing is performed at high temperature. The reason for this is to set the synthetic fibers mixed and used at a certain rate by heat, thereby reducing a shrinking force of the polyurethane elastic filaments. When such high-temperature processing is assumed, it is substantially impossible to subject a fabric mainly containing natural fibers or regenerated fibers having no thermoplasticity to the mold processing.

[0005] Further, in the case of the high-temperature processing as described above, when a fabric after dyeing processing is subjected to the mold processing, heat at the time of the mold processing causes a dye to sublime. Hence, a color of the processed part changes and fastness is deteriorated in many cases. Thus, there is provided only a product having low commercial product performance. In addition, in the case of the high-temperature processing, the fabric undergoes yellowing owing to the heat, and hence the processing cannot be employed for a light-colored fabric. Therefore, only part of the fabric subjected to the mold processing may be cut out and used, but it is impossible to subject only a desired part of the fabric as a whole to molding and then use the whole as a product.

[0006] In addition, in the case where a fabric mainly containing the natural fibers or the regenerated fibers and containing no polyurethane elastic filaments is subjected to the mold processing, it is necessary to apply heat at 200°C or more. This results in yellowing of the natural fibers or the regenerated fibers. On the other hand, when the polyurethane elastic filaments are used in combination with the natural fibers or the regenerated fibers, elasticity of the polyurethane causes shrinkage. Hence, it is practically impossible to subject a fabric using the natural fibers or the regenerated fibers and the polyurethane elastic filaments to the mold processing.

[0007] JP 2008-138298 A (Patent Literature 3) discloses a technology for mold processing, involving using a yarn that is excellent in low-temperature setting property. Although this yarn provides excellent formability from a low temperature region, a proper range of a processing temperature is narrow. Therefore, there are many limitations in a dyeing processing step in preparation of a base fabric to be subjected to the mold processing and fibers usable therewith are limited. In addition, when a heat treatment temperature, the mold processing temperature, or the like is shifted to high temperatures in the preparation of the base fabric, there arises a problem in that breakage of the polyurethane elastic filaments occurs, for example. Owing to the breakage of the polyurethane elastic filaments, a fabric after forming is liable to lose shape, has no stretching property, and is inferior in appearance as well.

[0008] The applicant of the present application has proposed a technology involving using heat-fusible polyurethane elastic filaments in a woven and knitted fabric containing polyurethane elastic filaments, thereby trying to achieve heat setting property, misalignment prevention, and the like (Patent Literatures 4 and 5). However, this technology achieves only misalignment prevention and fray prevention.

Citation List

Patent Literature

[0009]

[PTL 1] JP 2001-98446 A

[PTL 2] JP 2006-225817 A
[PTL 3] JP 2008-138298 A
[PTL 4] WO 2004/53218 A1
[PTL 5] JP 2007-182649 A

Summary of Invention

Technical Problem

[0010] The present invention has been made in order to solve the problems of the conventional technologies. An object of the present invention is to provide a technology with which mold processability can be imparted to even a woven and knitted fabric containing natural fibers or regenerated fibers having no thermoplasticity, and with which even a woven and knitted fabric containing thermoplastic fibers having low heat resistance, such as nylon or polypropylene, shows no yellowing or hardening after processing with the result that a light-colored fabric can also be subjected to mold processing.

Solution to Problem

[0011] The inventor of the present invention has made extensive studies in order to achieve the object, and as a result, has found that given heat-fusible polyurethane can be used to provide mold processability even when used in combination with natural fibers or regenerated fibers having no thermoplasticity. Thus, the present invention has been completed.

[0012] A woven and knitted fabric according to an embodiment of the present invention includes a yarn containing elastic fibers and at least one kind of non-elastic fibers, and the woven and knitted fabric being subjected to mold processing. The elastic fibers contain heat-fusible polyurethane elastic filaments each having a fineness of 17 dtex or more, and at least part of the heat-fusible polyurethane elastic filaments is heat-fused in the woven and knitted fabric; and the woven and knitted fabric is subjected to the mold processing at 120 to 190°C.

In one embodiment of the present invention, the elastic fibers include polyurethane elastic filaments; a mixture ratio of the polyurethane elastic filaments in the woven and knitted fabric is 5% or more; and a mixture ratio of the heat-fusible polyurethane elastic filaments in the polyurethane elastic filaments is 50% or more.

In one embodiment of the present invention, the woven and knitted fabric subjected to the mold processing after dyeing processing has a color change resistance grade according to JIS L0804 of Grade 3 or more.

In one embodiment of the present invention, the woven and knitted fabric has a forming rate of 20% or more after the mold processing.

Advantageous Effects of Invention

[0013] According to the present invention, mold processability can be imparted to even a woven and knitted fabric containing natural fibers or regenerated fibers having no thermoplasticity, and even a woven and knitted fabric containing thermoplastic fibers having low heat resistance, such as nylon or polypropylene, shows no yellowing or hardening after processing with the result that a light-colored fabric can also be subjected to mold processing.

[0014] The woven and knitted fabric subjected to mold processing of the present invention has the following functions and effects.

(1) Formability can be secured without impairing fabric feeling of a face yarn and hardening the yarn.
(2) Natural fibers or regenerated fibers can be used for the face yarn, and polypropylene fibers or a yarn having a special function such as cool feeling or heat generation, which can be used in only low-temperature processing, can be used in combination.
(3) A fabric having a high color change resistance grade after mold processing can be obtained.
(4) Even when a fabric after dyeing processing is subjected to mold processing, the fabric undergoes little change in fabric feeling and little yellowing, and hence a whole including all parts can be obtained as a product. That is, only a part such as a front portion or a back portion can be obtained through mold processing without cutting out a part, subjecting the part to separate treatment, and performing sewing.
(5) As a result of having a heat-fusible fabric, the fabric has preventive effects on a fray, a run, and a curl, and can be used with its cut portion subjected to no treatment.

Description of Embodiments

[0015] Hereinafter, the present invention is described in more detail.

A woven and knitted fabric of the present invention includes a yarn containing elastic fibers and at least one kind of non-elastic fibers, the woven and knitted fabric being subjected to mold processing. The elastic fibers contain heat-fusible polyurethane elastic filaments each having a fineness of 17 dtex or more, and at least part of the heat-fusible polyurethane elastic filaments is heat-fused in the woven and knitted fabric. The woven and knitted fabric is subjected to the mold processing at 120 to 190°C.

[0016] As the elastic fibers, elastic fibers well known in the art may be used. The elastic fibers are preferably polyurethane elastic filaments. As the polyurethane elastic filaments, polyurethane elastic filaments well known in the art may be used.

[0017] The heat-fusible polyurethane elastic filaments to be used in the present invention are not particularly limited as to their composition, production method, and the like as long as the heat-fusible polyurethane elastic filaments are polyurethane elastic filaments having such heat-fusion property as to allow the filaments at crossover points therebetween to be heat-fused each other.

[0018] The heat-fusible polyurethane elastic filaments may be obtained by, for example: (1) a method involving allowing a polyol to react with an excess molar amount of a diisocyanate to produce a polyurethane intermediate polymer having isocyanate groups at both ends, allowing the intermediate polymer to react with a low-molecular-weight diamine or low-molecular-weight diol having active hydrogen capable of easily reacting with the isocyanate groups of the intermediate polymer in an inert organic solvent to produce a polyurethane solution (polymer solution), and then removing the solvent to form the solution into a string; (2) a method involving solidifying a polymer obtained through a reaction among a polyol, a diisocyanate, and a low-molecular-weight diamine or a low-molecular-weight diol, dissolving the solidified polymer in a solvent, and then removing the solvent to form the solution into a string; (3) a method involving forming the solidified polymer into a string by heating without dissolving the polymer in a solvent; (4) a method involving allowing the polyol, the diisocyanate, and the low-molecular-weight diol to react with each other to produce a polymer, and forming the polymer into a string without solidifying the polymer; or (5) a method involving mixing the polymer or polymer solution obtained in each of the methods, and then removing the solvent from a mixed polymer solution to form the mixed polymer solution into a string.

[0019] The heat-fusible polyurethane elastic filaments may be preferably obtained by a method involving melt spinning the following polymer. The polymer is obtained by allowing a prepolymer (A) having isocyanate groups at both ends, which is obtained through a reaction between a polyol and a diisocyanate, to react with a prepolymer (B) having hydroxyl groups at both ends, which is obtained through a reaction among a polyol, a diisocyanate, and a low-molecular-weight diol. This method is suitable from an economic or environmental viewpoint as well because the method does not involve recovering a solvent.

[0020] In addition, a composition including 50 mass% or more of a polyether polyol in the polyol component in the raw materials is preferably adopted. With such composition, a polymer excellent in alkali resistance can be obtained, and hence limitations on conditions for the dyeing processing of fibers to be used in combination can be reduced.

[0021] With regard to the heat-fusion performance of each of the heat-fusible polyurethane elastic filaments to be used in the present invention, a heat-fusion force is preferably 0.15 cN/dtex or more, and more preferably 0 . 30 cN/dtex or more. If the heat-fusion force is less than 0.15 cN/dtex, satisfactory mold processability may not be obtained.

[0022] For example, in the case of a knitted fabric, the heat-fusion force is measured in the following manner. The knitted fabric is cut in a course direction, and an unraveling tension is measured for heat-fusible polyurethane elastic filaments or a yarn containing heat-fusible polyurethane elastic filaments, the fibers or yarn being knitted within the cut portion. An unraveling speed is set at 100 mm/min, and an average unraveling tension during a period of 1 minute is measured. When continuous unraveling is possible, average unraveling tensions are measured before and after heat treatment. Then, the average unraveling tension (cN) after the heat treatment is divided by the initial fineness (dtex) of the heat-fusible polyurethane elastic filaments to determine the heat-fusion force (cN/dtex). It should be noted that the heat-fusion force is so strong in some cases that the unraveling of the heat-fusible polyurethane elastic filaments is difficult. The heat-fusion force in those cases, which is needless to say 0.15 cN/dtex or more, is judged as "complete fusion."

[0023] The fineness of each of the heat-fusible polyurethane elastic filaments to be used in the present invention is, from the viewpoint of the fabric feeling of the woven and knitted fabric to be obtained, preferably 17 dtex or more, more preferably 22 to 311 dtex, still more preferably 28 to 156 dtex. If the polyurethane elastic filaments are thinner than 17 dtex, the area of a part to be heat-fused (i.e., a heat-fusion area), which is a crossover point between the polyurethane elastic filaments in contact with each other, decreases. As a result, the setting property of the fabric decreases, and hence desired moldability may be difficult to obtain. An upper limit for the fineness is not particularly limited. However, when the fineness of the fibers is large, the fabric becomes like rubber, and hence there is such a general tendency that fibers having small fineness are preferred.

[0024] As the heat-fusible polyurethane elastic filaments to be used in the present invention, a yarn formed of only the heat-fusible polyurethane elastic filaments (bare yarn) may be adopted, or a composite yarn such as a covered yarn (a single covered yarn or a double covered yarn), a double twist yarn, or an air interlaced yarnmaybe adopted. Of those,

a covered yarn is preferred because the heat-fusible polyurethane elastic filaments may be placed at the center of the composite yarn, and the coverage of the heat-fusible polyurethane elastic filaments can be easily controlled and uniform covering can be achieved.

[0025] When the composite yarn (e.g., covered yarn) is used as the heat-fusible polyurethane elastic filaments, non-elastic fibers for covering the heat-fusible polyurethane elastic filaments are not particularly limited. As such non-elastic fibers, there may be used, for example: natural fibers such as cotton, hemp, wool, and silk; regenerated fibers such as rayon, cupra, and polynosic; semi-regenerated fibers such as an acetate; and chemical synthetic fibers such as nylon, polyester, acryl, and polypropylene.

[0026] In the woven and knitted fabric of the present invention, as described above, the elastic fibers in the fabric are preferably polyurethane elastic filaments. In addition, the mixture ratio of the polyurethane elastic filaments in the fabric is preferably 5% or more, more preferably 8% or more, and still more preferably 10% or more. An upper limit for the mixture ratio of the polyurethane elastic filaments is preferably 35%, and more preferably 25%. In addition, the mixture ratio of the heat-fusible polyurethane elastic filaments in the polyurethane elastic filaments is preferably 50% or more, more preferably 80% or more, and still more preferably 100%. When the mixture ratio of the heat-fusible polyurethane elastic filaments falls within such range, a heat-fusion area between the polyurethane elastic filaments can be increased to provide a fabric having higher formability.

[0027] As the non-elastic fibers for constituting the woven and knitted fabric of the present invention, non-elastic fibers well known in the art may be used. Specific examples of the non-elastic fibers include those described above for the case where a composite yarn is used as heat-fusible polyurethane elastic filaments.

[0028] The woven and knitted fabric subjected to mold processing of the present invention is produced in substantially the following manner.

First, at least one kind of the non-elastic fibers and the elastic fibers containing a bare yarn of the heat-fusible polyurethane elastic filaments or a composite yarn containing the heat-fusible polyurethane elastic filaments are prepared. The elastic fibers and the non-elastic fibers are used to provide a woven and knitted fabric through weaving, knitting, or the like. The fabric then is subjected to heat setting or heat treatment of mold processing, thereby heat-fusing at least parts of the heat-fusible polyurethane elastic filaments with each other.

[0029] The woven and knitted fabric of the present invention may be constructed of a woven fabric or a knitted fabric depending on its applications. For example, when the woven and knitted fabric of the present invention is constructed of the woven fabric, any one of plain weaving, twill weaving, satin weaving, and the like may be employed. Further, when the knitted fabric is used, a well-known knitting method such as warp knitting or weft knitting may be appropriately employed.

[0030] For example, when the woven and knitted fabric of the present invention is constructed of the knitted fabric, a knitted fabric obtained by plating knitting the heat-fusible polyurethane elastic filaments and at least one kind of non-elastic fibers is preferred. The knitted fabric obtained by the plating knitting allows the heat-fusible polyurethane elastic filaments to be stably heat-fused with each other at a crossover point of knit stitches at the time of heat treatment, and thus the knit stitches can be fixed.

[0031] As a weft knitted fabric to be used in the present invention, plain knitting, rib knitting, double knitting, or the like may be appropriately employed. Plain knitting is preferred because a fabric is finished into a thin product and the fabric undergoes no significant change in shape of each of a needle loop and a sinker loop even when the fabric is partially stretched in molding.

[0032] The draft rate of the heat-fusible polyurethane elastic filaments at the time of the weaving or knitting of the fabric is preferably 1.0 to 3.6 times, and more preferably 2.0 to 3.0 times.

[0033] Next, the fabric is processed through general steps. For example, a series of processing steps "refinement-bleaching-presetting-dyeing-final setting" is performed. Then, the processed fabric is subjected to mold processing. The mold processing is preferably performed at a temperature of 120 to 190°C. Through the mold processing at such temperature, the woven and knitted fabric of the present invention subjected to the mold processing after dyeing processing may have a color change resistance grade of Grade 3 or more. If the temperature is less than 120°C, formability may be insufficient. If the temperature is 190°C or more, a face yarn undergoes yellowing or hardening, and hence the fabric may not clear the color change resistance grade. It shouldbe noted that the color change resistance grade may be determined according to JIS L0804.

[0034] Treatment of the mold processing is typically performed as follows. Further, a forming rate is calculated as follows.

A spherical jig made of iron (diameter: 105 mm, weight: 1.5 kg) as a mold processing jig is heated with a dryer to a given processing temperature. When the temperature of the jig becomes stable, the jig is pressed against a fabric, which is unstretched and left to stand still, for 1 minute to form the fabric. In this case, the jig is caused to sink by 70 mm. After having been left to stand still at ordinary temperature for 30 minutes, the depth of a depression in the fabric is measured, and the ratio of the measured value to the depth at the time of the forming, i.e., 70 mm is calculated, which is defined as the forming rate.

[0035] The forming rate of the woven and knitted fabric of the present invention is preferably 20% or more, more preferably 25% or more, and still more preferably 30% or more. The combination of such forming rate (mold processability) and the excellent color change resistance grade is one of the achievements of the present invention.

Examples

[0036] Hereinafter, the present invention is described specifically by way of examples and comparative examples. However, the present invention is not limited to these examples.

<Example 1>

[0037] Plating knitting was performed with a circular knittingmachine (28 gauges), using cotton 60/1 as a face yarn and Mobilon R (22 dtex: bare yarn) as heat-fusible polyurethane elastic filaments to prepare a plain knitted fabric. The plain knitted fabric was subjected to dyeing processing through general steps, and then subjected to mold processing. Table 1 shows the details of the fibers used and the like and the results of the evaluations of the mold processing.

[0038] In the table, "Mobilon R" is a trademark of Nisshinbo Textile Inc. , "ROICA" is a trademark of ASAHI KASEI FIBERS CORPORATION, and "ESPA" is a trademark of TOYOBO CO., LTD. Further, "Bare" represents a polyurethane elastic filament bare yarn, "SCY" represents a single covered yarn, "PP" represents polypropylene, and "PU" represents polyurethane elastic filaments.

<Examples 2 to 6>

[0039] Processing was performed using fibers shown in Table 1 in the same manner as in Example 1. It should be noted that the construction of heat-fusible polyurethane elastic filaments (SCY) used in Example 2 is as follows.
Core: heat-fusible polyurethane elastic filaments (Mobilon R), sheath: nylon (13 dtex)
Draft rate: 2.3 times, number of twists: 600 T/m
Knitting SCY at equal ratios in preparation of fabric
Table 1 shows the details of the fibers used and the like and the results of the evaluations of the mold processing. It should be noted that Examples 2 to 6 were performed changing the fineness of the heat-fusible polyurethane elastic filaments and/or the kind of the non-elastic fibers to be used in combination.

<Comparative Examples 1 to 5>

[0040] Processing was performed using fibers shown in Table 2 in the same manner as in Example 1. Table 2 shows the details of the fibers used and the like and the results of the evaluations of the mold processing. It should be noted that Comparative Examples 1 to 5 were performed using elastic fibers other than the heat-fusible polyurethane elastic filaments. ROICA and ESPA used in the comparative example are both polyurethane fibers having no heat-fusion property.

[0041]

[Table 1]

			Example 1	Example 2	Example 3	Example 4	Example 5	Example 6
Fibers used	Elastic fibers	Kind	Heat-fusible polyurethane	Heat-fusible polyurethane	Heat-fusible polyurethane	Heat-fusible polyurethane	Heat-fusible polyurethane	Heat-fusible polyurethane
		Product name	Mobilon R	Mobilon R	Mobilon R	Mobilon R	Mobilon R	Mobilon R
		Fineness (dtex)	22	44	78	44	33	33
	Non-elastic fibers	Kind	Cotton	Rayon	Cotton	PP	Nylon	Cupra
		Yarn count	60	60	40	84	78	60
	Usage mode of elastic yarn		Bare	SCY	Bare	Bare	Bare	Bare
	Draft rate of PU (times)		2.5	2.3	2.1	2.3	2.6	2.3
	Mixture ratio of PU (%)		8	15	20	19	14	13
Evaluations of mold processing	Processing temperature (°C)		170	160	180	150	180	170
	Forming rate (%)		32	36	56	29	62	40
	Color change resistance grade		5	5	4-5	4	4	3
	Condition of PU		Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory

[0042]

[Table 2]

			Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4	Comparative Example 5
Fibers used	Elastic fibers	Kind	Regular dry yarn	Dry yarn having high setting property	Yarn by melt spinning having high setting property	Regular dry yarn	Regular dry yarn
		Product name	ROICA (regular)	ROICA BX	ESPA M	ROICA (regular)	ROICA (regular)
		Fineness (dtex)	33	22	22	33	22
	Non-elastic fibers	Kind	Cotton	Cotton	Cotton	Cotton	Nylon
		Yarn count	60	60	60	60	78
	Usage mode of elastic yarn		Bare	Bare	Bare	Bare	Bare
	Draft rate of PU (times)		2.5	2.5	2.5	2.5	2.5
	Mixture ratio of PU (%)		12	8	8	12	10
Evaluations of mold processing	Processing temperature (°C)		180	180	160	220	220
	Forming rate (%)		7	12	50	30	40
	Color change resistance grade		4-5	4-5	5	2	2
	Condition of PU		Satisfactory	Satisfactory	Core breakage is present	Satisfactory	Satisfactory

[0043] Further, Table 3 shows the results of a test performed for confirming the formability of the yarns used. The test was performed by the following procedure.
Plating knitting was performed at a draft rate of 2.0 times using polyester 33T10 filaments for a face yarn, using polyurethane elastic filaments in Table 3 for a back yarn, and using a pantyhose knitting machine (L416/R manufactured by Lonati, kettle diameter: 4 inches, number of needles: 400) to prepare a plain knitted fabric. The fabric was stretched 1.2 times in both warp and weft directions and subjected to heat setting at 150°C for 60 seconds to provide a base fabric. The resultant fabric was evaluated for its mold processability in treatment at 120°C and the heat-fusion force of the polyurethane elastic filaments.

[0044]

[Table 3]

	Example 1	Comparative Example 1	Comparative Example 2	Comparative Example 3
Elastic fibers	Heat-fusible polyurethane	Regular dry yarn	Dry yarn having high setting property	Yarn by melt spinning having high setting property
	Mobilon R	Regular ROICA	ROICA BX	ESPA M
Forming rate in processing at 120°C (%)	46	14	21	64
Heat-fusion force (cN/dtex)	1.5	0.05	0.08	1.1

[0045] As evident from Tables 1 and 2, it can be understood that each example of the present invention is excellent in both forming rate and color change resistance grade. Comparative Examples 1 and 2 were inferior in formability, and Comparative Examples 4 and 5 were inferior in color change resistance. Comparative Example 3 was satisfactory in formability, but breakage of polyurethane elastic filaments occurred. As also evident from Tables 1 and 2, according to the present invention, mold processability can be imparted to even a fabric containing natural fibers or regenerated fibers having no thermoplasticity, and even a woven and knitted fabric containing thermoplastic fibers having low heat resistance, such as nylon or polypropylene, does not show yellowing after processing with the result that a light-colored fabric can also be subjected to mold processing. As a result, satisfactory formability can be imparted to a product required to have shape-maintaining property, such as underwear such as a cup portion of a brassiere, or a hip portion of shorts or a girdle, a knitted fabric for indoor sports such as swimming wear, or a woven fabric for outerwear such as a bottom, and the designing of the product can be performed freely. In particular, the face yarn free of hardening provides good fabric feeling of the fabric and the use of the natural fibers or the regenerated fibers causes no skin disorder such as rash even upon direct contact with a delicate portion of skin. In addition to the field of clothing, a wide range of applications are possible, such as a combination with another material to provide a laminate material having stretching property.

Industrial Applicability

[0046] The woven and knitted fabric of the present invention can be suitably utilized in the field of clothing. For example, the woven and knitted fabric can be suitably utilized as underwear such as a cup portion of a brassiere, or a hip portion of shorts or a girdle, a knitted fabric for indoor sports such as swimming wear, or a woven fabric for outerwear such as a bottom. In addition, the woven and knitted fabric of the present invention can also be utilized as, for example, a laminate material having stretching property in other industrial fields.

Claims

1. A woven and knitted fabric, comprising a yarn containing elastic fibers and at least one kind of non-elastic fibers, the woven and knitted fabric being subjected to mold processing,
wherein:

   the elastic fibers contain heat-fusible polyurethane elastic filaments each having a fineness of 17 dtex or more;
   at least part of the heat-fusible polyurethane elastic filaments is heat-fused in the woven and knitted fabric; and
   the woven and knitted fabric is subjected to the mold processing at 120 to 190°C.

2. A woven and knitted fabric according to claim 1,
wherein:

   the elastic fibers comprise polyurethane elastic filaments;
   a mixture ratio of the polyurethane elastic filaments in the woven and knitted fabric is 5% or more; and
   a mixture ratio of the heat-fusible polyurethane elastic filaments in the polyurethane elastic filaments is 50% or more.

3. A woven and knitted fabric according to claim 1 or 2, wherein the woven and knitted fabric subjected to the mold processing after dyeing processing has a color change resistance grade according to JIS L0804 of Grade 3 or more.

4. A woven and knitted fabric according to any one of claims 1 to 3, which has a forming rate of 20% or more after the mold processing.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/073310

A. CLASSIFICATION OF SUBJECT MATTER
D06C7/00(2006.01)i, *D03D15/08*(2006.01)i, *D04B1/18*(2006.01)i, *D04B21/00*(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)
D06B1/00-23/30, D06C3/00-29/00, D06G1/00-5/00, D06H1/00-7/24, D06J1/00-1/12, D03D1/00-27/18, D04B1/00-1/28, D04B21/00-21/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2011
Kokai Jitsuyo Shinan Koho	1971-2011	Toroku Jitsuyo Shinan Koho	1994-2011

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2001-98446 A (Asahi Kasei Corp.), 10 April 2001 (10.04.2001), claims 1, 8; examples (Family: none)	1-4
A	JP 2006-225817 A (Kabushiki Kaisha Soshiaru), 31 August 2006 (31.08.2006), claim 1; paragraph [0027] (Family: none)	1-4
A	JP 2008-138298 A (Toyobo Co., Ltd.), 19 June 2008 (19.06.2008), claims 1 to 2; paragraphs [0016], [0018]; example 4 (Family: none)	1-4

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

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14 March, 2011 (14.03.11)	22 March, 2011 (22.03.11)
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/073310

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004/053218 A1 (Nisshinbo Industries, Inc.), 24 June 2004 (24.06.2004), entire text & US 2006/0030229 A1 & EP 1595987 A1 & KR 10-2005-0085304 A & CN 1723307 A	1-4
A	JP 2007-182649 A (Nisshinbo Industries, Inc.), 19 July 2007 (19.07.2007), entire text (Family: none)	1-4
A	WO 2003/33797 A1 (Asahi Kasei Corp.), 24 April 2003 (24.04.2003), entire text & US 2005/0016223 A1 & EP 1437432 A1 & CN 1571870 A	1-4
A	JP 2003-201654 A (Matsumoto Textile Co., Ltd.), 18 July 2003 (18.07.2003), claims 1, 20 & US 2004/0237597 A1 & EP 1443135 A1 & CN 1464923 A	1-4

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/073310

While the inventions set forth in claims 1-4 specify a heat-bonded polyurethane elastic fiber as an elastic fiber, only a heat-bonded polyurethane elastic fiber, the heat bonding force of which is 1.5 cN/dtex is disclosed within the meaning of PCT Article 5 as shown in the embodiment 1; thus the inventions set forth in claims 1-4 are not fully supported within the meaning of PCT Rule 6.

Consequently, the search has been made on the scope supported and disclosed by the description, namely the heat-bonded polyurethane elastic fiber, the heat-bonding force of which is 1.5 cN/dtex.

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2001098446 A **[0002] [0009]**
- JP 2006225817 A **[0002] [0009]**
- JP 2008138298 A **[0007] [0009]**
- WO 200453218 A1 **[0009]**
- JP 2007182649 A **[0009]**