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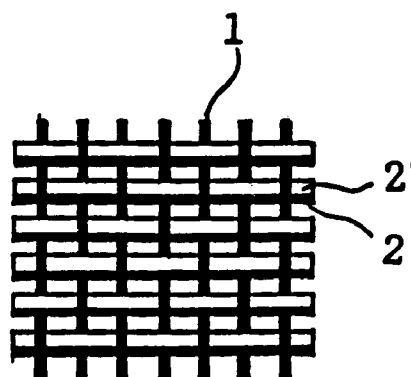
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(54) HEAT-BONDABLE WOVEN OR KNITTED FABRIC

(57) The invention provides an easily heat-bondable woven or knitted fabric for which neither sewing nor an adhesive agent is need. A woven or knitted fabric (A) is textured from warps (1), each consisting of 24 polyester (m.p.: 250°C) filaments of 50 deniers, and wefts (2), each consisting of polypropylene (m.p.: 160°C) filaments, say, 24 filaments of 50 deniers plus 24 filaments of 75 deniers, between which there is a melting point difference of at least 20°C. The sites of the fabric to be bonded together are heated under pressure at a temperature higher than or equal to 160°C and lower than or equal to 250°C. The polypropylene wefts melt to serve as an adhesive agent while the polyester warps remain intact.

FIG. 1



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Description

FIELD OF THE INVENTION

This invention relates to a woven or knitted fabric used for making various textile products such as bags, which enables strong bond strength to be achieved with heat bonding yet with no need of sewing at least two woven or knitted fabric pieces.

BACKGROUND TECHNIQUE

As generally known so far in the art, woven or knitted fabrics are bonded together by machine-sewing.

The bonding of woven or knitted fabrics made of synthetic fibers having thermoplasticity, too, is often carried out by conventional machine-sewing, except when thin woven or knitted fabrics not required to have strong bond strength are bonded together by a combined sealing and cutting technique.

As well known in the art, machine-sewing is labor-intensive operations unsuitable for mass fabrication, and the combined sealing and cutting technique is practically unacceptable for lack of any bond strength, especially for lack of any sealing strength for woven or knitted fabrics of at least 40 g/m² in basis weight.

Thus, what becomes a problem when woven or knitted fabrics are bonded together by heat-bonding yet without recourse to sewing is the bond strength of sites where they are bonded together.

Films are bonded together over certain surfaces, while woven or knitted fabrics are bonded together at points. Under the same conditions, therefore, the woven or knitted fabrics are weaker than the films due to a bonded area difference between them.

In the case of heat-bonding, woven or knitted fabrics must thus be wider in sealing area than films, etc. In other words, it is required to use a wider seal bar for heat-bonding purposes.

Synthetic fibers of thermoplasticity are heat-bonded together with a temperature rise while they shrink by the action of heat. Therefore, when the temperature of a seal bar is kept higher than the heat-bonding temperature, no stable bonding of woven or knitted fabrics is achievable because they shrink concurrently upon coming into contact with the seal bar.

An object of the present invention is to provide a woven or knitted fabric which enables textile products having the necessary and sufficient bond strength to be fabricated by a heat-bonding technique while they are kept from shrinkage.

DISCLOSURE OF THE INVENTION

The present invention provides a woven or knitted fabric which is textured from at least two types of synthetic fiber yarns of thermoplasticity, between which there is a melting point difference of at least 20°C.

In the texture of the woven or knitted fabric, two or

more types of yarns having a certain melting point difference are incorporated. When the sites of the woven or knitted fabric to be bonded together is heated under pressure at a temperature higher than the low melting point of one type of yarns and lower than the high melting point of the other type of yarns, the low-melting yarns melt to have bonding action while the high-melting yarns serve to keep the low-melting yarn from shrinkage that occurs within the period during which the low-melting yarns soften and finally melt, so that the bonded sites can be maintained constant in terms of dimensional stability.

The melting point difference of at least 20°C is here understood to define a temperature difference for keeping the high-melting yarns from softening and shrinkage when the woven or knitted fabric is heated under pressure at the low-melting temperature.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows the texture of one preferable woven or knitted fabric according to this invention.

BEST MODE FOR CARRYING OUT THE INVENTION

The present invention will now be explained more specifically with reference to the accompanying drawing.

FIG. 1 is a partly plan view of the texture of one embodiment of the woven or knitted fabric according to the present invention.

A woven or knitted fabric (A) is textured from yarns which vary in melting point. As an example, the woven or knitted fabric is textured from warps (1), each consisting of 24 polyester (m.p.: 250°C) filaments of 50 deniers, and wefts (2), each consisting of polypropylene (m.p.: 160°C) filaments, say, 24 filaments of 50 deniers plus 24 filaments of 75 deniers.

When the sites of the fabric to be bonded together are heated under pressure at a temperature higher than or equal to 160°C and lower than or equal to 250°C, the polypropylene wefts serve as an adhesive agent while the polyester warps remain intact.

It is here to be understood that while warps (2') lower than in melting point than warps (1) and wefts (2) and warps (1) and wefts (2) may be used, either warps (1) or wefts (2) may be made of a material having a varying melting point.

Referring now to one example of a woven or knitted fabric textured from such yarns, it is textured from warps, each consisting of one polyester filament of 20 deniers, and wefts, each having a combined core and sheath structure consisting of 12 polyester filaments of 30 deniers, the latter being different in melting point from the former.

In this case, the melting point of the sheaths is lower than those of the warps and the cores of the wefts. Upon heated under pressure, the sheaths of the wefts serve as an adhesive agent while the warps and

the cores of the wefts remain intact.

It is to be noted that while FIG. 1 is directed to an example where one yarn is separated into a core and sheath for the purpose of illustration alone, it may be separated any desired parts or the like.

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APPLICABILITY OF THE INVENTION TO INDUSTRY

As explained above, the woven or knitted fabric according to the present invention is textured from yarns varying in melting point, so that it can be heat-bonded while the yarns having a lower melting point are used as an adhesive agent. Over conventional fabrics fabricated by heat-bonding using an adhesive film or otherwise sewing, therefore, the instant fabric is much more improved in terms of fabrication cost and time and, hence, operation efficiency, and so is best suited for products to be bonded at numerous sites, for instance, bags.

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Claims

1. A woven or knitted fabric characterized in that it is textured from at least two types of synthetic yarns of thermoplasticity, between which there is a melting point difference of at least 20°C.

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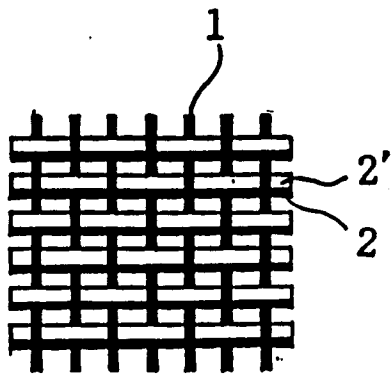
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FIG. 1



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP94/01421

A. CLASSIFICATION OF SUBJECT MATTER Int. Cl ⁵ D03D15/00 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) Int. Cl ⁵ D03D15/00 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922 - 1994 Kokai Jitsuyo Shinan Koho 1971 - 1994 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.
X	JP, U, 57-56780 (Unitika Ltd.), April 2, 1982 (02. 04. 82), Claim, (Family: none)	1
Y	JP, A, 4-33977 (Kuraray Co., Ltd.), February 5, 1992 (05. 02. 92), Claim 2, (Family: none)	1
Y	JP, A, 4-136232 (Kanebo, Ltd.), May 11, 1992 (11. 05. 92), [0011], (Family: none)	1
Y	JP, A, 61-47847 (Chisso Corp.), March 8, 1986 (08. 03. 86), (Family: none)	1
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
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Date of the actual completion of the international search September 7, 1994 (07. 09. 94)		Date of mailing of the international search report September 27, 1994 (27. 09. 94)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.		Authorized officer Telephone No.