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(54) METHOD OF PRODUCING STRETCHABLE FABRICS

VERFAHREN ZUR HERSTELLUNG VON DEHNBAREN GEWEBEN

PROCEDE DE PRODUCTION DE TISSUS EXTENSIBLES

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Description

[0001] This invention relates to a process for treating fabric particularly but not exclusively for application in clothing manufacture, which enables a certain degree and type of stretch to be imparted to, for example, a waistband.

[0002] Conventionally, waistband interlining can be elasticated and the outer fabric of the waistband "rouched" or "gathered" providing for a degree of stretch but at the expense of compromising the "tailored" look and fit of the garment to which such an elasticated waistband is attached. Alternatively, it comprises a "non-stretch" interlining which acts as a stiffener stabilising the outer fabric, affording some degree of reinforcement and perhaps providing added resilience. The disadvantage of the latter system of construction is that there is little "give" or "ease" in that area of the garment incorporating the waistband, and the fit of the garment may become uncomfortable to the wearer for example after meals when the waist expands. In prolonged wear, the top of the waistband can be forced to "give way" and effectively "roll over", rendering the look of the garment unsightly. In addition, a wearer falling mid-way between sizing of "off the peg" waistbanded garments selects a garment which is either too tight or too loose in wear.

[0003] In our European patent publication EP-B-0705356 (preamble of claim 1) we disclose a method of treating a woven fabric characterised in the combination of two stages - a first stage which includes applying heat and pressure to the fabric in such a manner that the yarn strands substantially across the width of the fabric are forced closer together thus imparting generally semi-permanent "ease" or "stretch" into the fabric, and a subsequent, second stage which includes affixing to the fabric treated according to the first stage of the method a selected interlining and/or interlining combination having inherent stretch whereby the semi-permanent "ease" or "stretch" imparted to the fabric during the first stage is made substantially permanent during the second stage.

[0004] The interlining or interlining combination used in the method of the above European patent publication must itself have sufficient stretch characteristics, and sufficiently powerful elasticity, in order to ensure that the woven fabric in the finished combination is brought back to its original length after stretching.

[0005] Such interlinings or interlining combinations are available but are relatively expensive to produce and may involve relatively expensive stretch yarns such as "Lycra" yarns.

[0006] GB-A-2256785 discloses a waistband formed of a non-elastic fabric adhered to an elastic material. The non-elastic fabric is able to retract slightly owing to the natural looseness of the weave.

[0007] The present invention seeks to provide a method of producing a combined fabric with similar stretch characteristics to that described in our above-men-

tioned European patent publication, initially employing less resilient and less expensive interlinings or interlining combinations, and additionally to provide a method capable of producing such fabrics in a single step process.

[0008] According to the present invention there is provided a method of treating a woven fabric to produce a stretchable fabric combination as set out in the appended claims.

[0009] Preferably, the bonding is carried out employing a stretchable bonding agent or film.

[0010] While not restricted thereto, the woven fabric employed in the method of the invention will usually be of a non-synthetic textile material, for example wool or cotton, which can not normally be permanently set by heat alone. By contrast, the interlining material will normally be a synthetic material which is thermoplastic and can be heat set, such as a polyester or polyamide textile material.

[0011] The bonding coating or film is preferably material which as well as bonding will impart stretch to the final combined product and it is preferred for this purpose to use a polyurethane material. The material may be coated on either the woven non-synthetic fabric or the interlining fabric or may be a film interposed between the two. This is employed where additional 'pull' is required to give the necessary stretch and recovery to the final product. Where, for example, it is desired to attach a (non-stretch) interlining to a stretch fabric, then this may not be necessary, as discussed more fully herein-after.

[0012] The method of the invention is preferably carried out by the machine as described in our above-mentioned European patent publication which comprises means for applying heat and pressure to a woven fabric, and transport means for effecting relative movement between the heat and pressure application means and the fabric whereby passage of the fabric through the apparatus results in the yarn strands substantially across the width of the fabric being forced closer together thus imparting semi-permanent stretch into the fabric. This process may be described as "compressive shrinking" for the purposes of simplicity in the present description. When applied to a non-synthetic woven fabric, compressive shrinking produces stretch but this is not permanent in the sense that it is gradually lost or, if a subsequent heat or steam treatment is applied, will be lost completely at once. Thus, in the process of our above-mentioned European patent publication, the second stage was used to fix, or render "permanent", the stretch characteristics.

[0013] In the process of the present invention the interlining material is both fixed to the woven non-synthetic fabric and at the same time is itself set so that the compressive shrinking applied to it is "permanent". Being bonded to the woven fabric it renders the stretch imparted to that fabric "permanent" also.

[0014] The interlining material used may be a fine wo-

ven polyamide or polyester fabric, preferably the latter, although other fabric structures could be used, such as needled or water entangled non-wovens. While the interlining supplied for use with our above-mentioned European patent publication needed to have a considerable degree of stretch and high elastic modulus, that used initially in the present invention may be of less stretchable and much cheaper material. The additional stretchability is supplied by the compressive shrinking and the extra elastic modulus may be supplied by the bonding material which is why polyurethane is preferred.

[0015] One passage through the machine may be sufficient to produce the finished product in that the bond produced by the bonding coating or film is sufficiently strong for the combination to withstand subsequent wear. Alternatively, if this is not the case, the combined fabric can be passed through a subsequent means such as that described in our above mentioned patent publication for affixing the fabric previously treated in the compressive shrinking area by a second application of heat and pressure to effect complete bonding.

[0016] As before, the fabric may be treated in full width form but typically it is treated in strips which are then formed into trouser or skirt waistbands. Clearly the cost of a machine to treat such strips of material is considerably less than that required to treat fabric in full width. It is therefore an advantage of the invention that, with the interlining necessary to stabilise the stretch in the woven fabric being effectively produced at the same time as it is affixed to the woven fabric, the interlining is produced in narrow width, and a full-width production machine for the interlining is rendered unnecessary.

[0017] There are, however, many applications where this process could be used in a wide width form, e.g. from 1.5 metres to 5 metres width, where there is a requirement to convert rigid fabrics into ones with linear stretch.

[0018] It has been found that, at the temperature normally used in the compressive shrinking process the interlining fabric, a thermoplastic synthetic material, typically a polyester fabric, is heat set so that the extra elasticity imparted to it by the compressive shrinking process is rendered "permanent".

[0019] Where stretch fabrics are utilised in the production of stretch trouser or skirt waistbands, the majority of manufacturers prefer to affix, e.g. fuse, a stretch interlining to the surface of the waistband. This stretch interlining is generally, although not always, of a non-woven material and is significantly more expensive than its 'rigid' equivalent. The interlining in this case is not required to impart elastic recovery properties to the waistband as the waistband fabric is already a stretch variety. The stretch interlining is used to make the waistband fabric more substantial and easier to handle in subsequent processing.

[0020] In accordance with a further embodiment of the invention a standard rigid fusible non-woven or other relatively rigid knitted material may be processed in narrow

width form with the stretch waistband fabric through the above-mentioned compressive shrinking machine to convert the two into a laminate which has stretch characteristics in the length direction. As the waistband fabric is a stretch material, the interlining needs only to move with the fabric and is not required to provide additional stretch recovery, and thus a stretchable bonding agent is not required (although a bonding agent may be used).

[0021] In addition, the stretch fabric may be tensioned during processing with the 'rigid' interlining so that it is compressively 'shrunk' back to its original dimensions. That is, if the process achieves 20% shrinkage in the interlining, the waistband fabric would be pre-tensioned out by 25% of its length prior to compressive shrinking. After processing it would then shrink back to its original length.

[0022] While the fabric of the invention is primarily useful for waistbands for skirts, trousers and the like it is not so-limited. Other uses will become apparent to those skilled in the art. For example, as disclosed in our PCT application GB99/01146 (EP-A 1 071 349) parts of the woven fabric can be left unstabilised, or stabilised to a lesser degree, so that on subsequent relaxation the composite assumes a desired shape, for example a curved shape, which may be useful in many areas in garment construction.

Claims

1. A method of treating a woven fabric, which is a non-synthetic textile material, for example wool or cotton, which cannot normally be permanently set by heat alone, to produce a stretchable fabric combination which comprises applying heat and pressure to the fabric in such a manner that the yarn strands substantially across the width of the fabric are forced closer together, thus imparting generally semi-permanent stretch into the fabric; **characterised by** simultaneously at least partially bonding thereto a synthetic interlining fabric which is a synthetic material which is thermoplastic and can be heat set, such as a polyester or polyamide textile material.
2. A method as claimed in claim 1, in which the bonding is carried out by coating or film which as well as bonding will impart stretch to the final combined product.
3. A method as claimed in claim 2, in which the bonding coating or film is a polyurethane material.
4. A method as claimed in claims 2 or 3 in which the bonding coating or film is coated on either the woven non-synthetic fabric or the interlining fabric or is a film interposed between the two.

5. A method as claimed in any of claims 1 to 4 wherein the interlining material used is a fine woven polyamide or polyester fabric.
6. A method of combining a standard rigid fusible non-woven or other relatively rigid knitted material in narrow width form with a stretch waistband fabric to produce a laminate which has stretch characteristics in the length direction, whereby the stretch waistband fabric is produced by the method according to claim 1.
7. A method as claimed in claim 5 wherein the stretch fabric is tensioned during processing with the interlining so that it is compressively "shrunk" back to its original dimensions.

Patentansprüche

1. Verfahren zum Behandeln eines Webstoffs, der ein nichtsynthetisches Textilmaterial ist, z.B. Wolle oder Baumwolle, das normalerweise nicht mit Wärme allein permanent fixiert werden kann, um eine dehnbare Stoffkombination herzustellen, das das derartige Anwenden von Wärme und Ausüben von Druck auf den Stoff umfasst, dass die Garnfasern im Wesentlichen über die Breite des Stoffs enger zusammengedrückt werden, wodurch dem Stoff allgemein teilpermanente Dehnbarkeit verliehen wird, **gekennzeichnet durch** gleichzeitiges wenigstens teilweises Binden eines synthetischen Verstärkungsstoffs daran, der ein synthetisches Material ist, das thermoplastisch ist und thermofixiert werden kann, wie z.B. Polyester- oder Polyamid-Textilmaterial.
2. Verfahren nach Anspruch 1, bei dem das Binden durch Beschichtung oder Film durchgeführt wird, das zusätzlich zum Verbund dem Endkombinationsprodukt auch Dehnbarkeit verleiht.
3. Verfahren nach Anspruch 2, bei dem die Verbundbeschichtung oder der Verbundfilm ein Polyurethanmaterial ist.
4. Verfahren nach Anspruch 2 oder Anspruch 3, bei dem die Verbundbeschichtung oder der Verbundfilm entweder auf die gewirkte nichtsynthetische Ware oder den Verstärkungsstoff aufgetragen ist oder ein zwischen die beiden zwischengelegter Film ist.
5. Verfahren nach einem der Ansprüche 1 bis 4, bei dem der verwendete Verstärkungsstoff ein feiner Polyamid- oder Polyester-Webstoff ist.
6. Verfahren des Kombinierens eines normalen stei-

fen schmelzbaren Vliesstoffes oder eines anderen relativ steifen gewirkten Materials in schmaler Breite mit einem Stretch-Bundstoff, um einen Schichtstoff herzustellen, der in der Längsrichtung Dehnbarkeitseigenschaften hat, wobei der Stretch-Bundstoff mit dem Verfahren nach Anspruch 1 hergestellt wird.

7. Verfahren nach Anspruch 5, bei dem der Stretchstoff während des Verarbeitens mit dem Verstärkungsstoff gespannt wird, sodass er stauchend auf seine ursprünglichen Maße "zurück" geschrumpft wird.

Revendications

1. Procédé destiné à traiter un tissu, qui est une matière textile non synthétique, par exemple de la laine ou du coton, qui normalement ne peut pas être fixé par la chaleur uniquement, pour produire une combinaison de tissu extensible, procédé qui comporte l'application de chaleur et de pression sur le tissu d'une telle manière que les brins de fil se trouvant dans une large mesure en travers de la largeur du tissu sont forcés de se rapprocher, pour communiquer ainsi une extensibilité généralement semi-permanente dans le tissu ; **caractérisé par** le liage simultané au moins partiellement dessus d'un tissu de renfort synthétique qui est un matière synthétique, qui est un thermoplastique et qui peut être fixé par la chaleur, tel qu'une matière textile en polyester ou en polyamide.
2. Procédé selon la revendication 1, dans lequel le liage est réalisé par revêtement ou par pelliculage qui en plus du collage communique une extensibilité au produit combiné final.
3. Procédé selon la revendication 2, dans lequel le revêtement ou le pelliculage de liage est une matière de polyuréthane.
4. Procédé selon la revendication 2 ou la revendication 3, dans lequel le revêtement ou le pelliculage de liage est revêtu soit sur le tissu non synthétique soit sur le tissu de renfort ou est une pellicule interposée entre les deux.
5. Procédé selon l'une quelconque des revendications 1 à 4, dans lequel la matière de renfort utilisée est un tissu fin en polyamide ou en polyester.
6. Procédé de combinaison d'une matière non tissée fusible rigide standard ou autre matière tricotée relativement rigide ayant une forme de largeur étroite avec un tissu de ceinture extensible afin de produire un stratifié qui présente des caractéristiques d'ex-

tensibilité dans le sens de la longueur, ce par quoi, le tissu de ceinture extensible est produit par le procédé selon la revendication 1.

7. Procédé selon la revendication 5, dans lequel le tissu extensible est contraint au cours du traitement avec le tissu de renfort de telle manière qu'il est "rétracté" par compression de retour à ses dimensions d'origine.

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