

[54] LAMINATED FABRIC

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428/236

[51] Int. Cl.² D06M 17/00

[58] Field of Search 156/62.4, 167; 28/1 SM

[56] References Cited

UNITED STATES PATENTS

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3,110,642 11/1963 Harrington et al. 156/167 X

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3,562,771 2/1971 Fridrichsen 156/167

3,676,242 7/1972 Prentice 156/62.4

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[57] ABSTRACT

A laminated fabric is disclosed comprising a woven or knitted web of textile fibers reinforced by a backing directly united thereto of a spun bonded non-woven web.

4 Claims, No Drawings

LAMINATED FABRIC

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to laminated fabrics and more particularly to a reinforced woven or knotted textile fabric.

2. Description of the Prior Art

It has been common practice to reinforce woven and knitted textile fabrics, including pile fabrics, with backings primarily of polymers in latex form. Fabrics of this nature are widely used as upholstery fabrics. Such backings materially strengthen the face fabric and increase its useful life. The reinforced fabric is usually considerably increased in weight, often does not have a good hand, and may present difficulties if attempts are made to remove spots or to clean the fabric with solvents which are destructive of the backing.

It has also been proposed by Schoenberger, U.S. Pat. No. 2,755,535 to provide a knitted fabric with an adherent fabric or layer of vinyl plastic but this is subject to similar objections as those applicable to the rubber or latex backed fabrics.

In Guthrie, U.S. Pat. No. 3,152,949, a laminate of woven and non-woven fibers is shown with a plastic resin base.

In Burnett, U.S. Pat. No. 3,440,113, a knitted fabric is disclosed with a substrate of synthetic fiber yarns with interposed adhesives.

Sugarman, in U.S. Pat. No. 3,554,852, shows a laminate which has a woven fabric with a heat bonded non-woven fabric on one face.

Secrist, in U.S. Pat. No. 2,774,127, shows laminates of woven fabrics and fibrous sheets.

It has also been proposed to form webs of textile fibers known as spun-bonded non-woven fabrics. Typical illustrations are shown in U.S. Patents to McIntire, No. 3,304,220; Blades, No. 3,081,519; Kinney, No. 3,341,394; Wagle, No. 3,499,810; Dorchner et al., No. 3,692,618; and Werner et al. No. 3,687,759. These patents and similar disclosures provide for the formation of the web as a finished product although Kinney suggests bonding the fibers to a thermoplastic or other film or to metal foils.

The prior art, insofar as known to the applicant, has not heretofore, suggested the deposition onto the back face of a knitted or woven fabric, of textile fibers to directly form on the back face a spun-bonded non-woven fabric in adherent and reinforcing relation thereto so as to provide a new and improved laminated fabric having properties not heretofore available.

SUMMARY OF THE INVENTION

In accordance with the invention, a laminated fabric is provided having a face web of knitted or woven fabric of ornamental character and which may be of low seam strength with a reinforcement or backing of spun-bonded non-woven textile fibers directly applied onto the rear of the face web at the time of the delivery of the filaments from the spinnerets or veiling nozzles.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The nature and characteristic features of the invention will be more readily understood from the following description although it should of course be understood that the description is illustrative merely and that vari-

ous modifications and changes can be made without departing from the invention.

In accordance with the invention a knitted or woven fabric made of yarns of natural fibers but especially of synthetic plastic materials such as polyester, polypropylene or nylon, is utilized as a face fabric. The face fabric may be of such character that the yarns in the fabric have a tendency to slip and accordingly has a low seam strength. Such fabrics may be of attractive appearance with pattern effects desirable in upholstery fabrics but lack dimensional stability and related physical requirements and as woven or knitted are not satisfactory for such use. Such fabrics, in conventional widths such as those employed for upholstery, and of an indefinite length many times that of the width can be rendered useful. Such fabric is continuously advanced past a backing application station with its back face exposed and disposed upwardly. The face fabric may be preheated, if desired, but not to an extent to injure the fabric and dependent upon the material to be applied to the face fabric or may be precooled to aid in the setting of the applied material.

The upwardly facing back surface then has directly and continuously applied thereto, as the face fabric is advanced, fibers which form a spun bonded non-woven fabric lamina.

Numerous plastic materials, synthetic and natural including copolymers and blends of the same, are available for the filaments of the spun bonded non-woven fabric laminate, and these include styrene, butadiene, polyisoprene, natural rubber, butadiene acrylonitrile, acrylic, vinyl chloride, vinyl acetate, vinyl alcohol, polyurethane, polyester, polyamide, mod-acrylic, epichlorhydrin, chloroprene, hypalon, butyl, olefin, vinylidene chloride and ethylene.

Various spinning techniques may be used, employing emulsions, solutions or hot melts, to supply fibers onto the back surface, interrupted from time to time if desired during filament application, with the filaments randomly arranged and lightly dispersed, bonded at the filament crossings and bonded to the back face.

The fluid delivered through spinnerets or veiling nozzles may be such that the fibers are formed upon their extrusion, although the fluid for fiber formation may contain volatile solvents which disperse and leave the fibers, or a solution may be employed which upon delivery coagulates to form fibers. The nozzles or extrusion orifices may be fixed but preferably oscillate to provide the desired distribution of filaments to develop, on the back of the face fabric, a web or sheet of porous fibrous nature and in which the strength is derived from the bonding of the filaments at their junctions and the bonding of the filaments to the face fabric. Such web or sheet has high tensile strength, minimal elongation, excellent tear strength, good bulk, non-raveling edges and excellent dimensional stability. These characteristics greatly enhance the qualities of the laminated fabric.

While it is possible to crimp the filaments between their ejection and their deposit onto the back surface of the face fabric this may result in undue cooling or prolongation of the time intervening prior to the deposition and bonding of the filaments.

Any of the well known processes for deposition of spunbonded non-woven filaments can be employed so long as there is direct application of the filaments onto the face fabric. If compaction of the filaments is desired

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this may be effected by high velocity air or inert gas streams or by passing between rolls or belts.

It may be noted that the filaments, individually considered, found most suitable are hard materials, with high strength, derived from polymers of high modulus of elasticity, although elastomers may provide suitable filament materials.

The resulting laminated fabric has been found to have greatly improved characteristics over those of the face fabric alone. Specifically the laminated fabric has an attractive appearance, provides a fabric suited to the hard treatment and wear to which upholstery fabrics are subjected, has a good hand, has good breathing qualities, and other good qualities.

I claim:

1. The method of making a laminated fabric which comprises advancing a band of low seam strength knitted or

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woven textile fabric with the back surface exposed, and

spin bonding filaments onto said back surface while the band is being advanced and forming thereon with said filaments a spun bonded non-woven lamina in adhered engagement with the back surface.

2. The method as defined in claim 1 which comprises compacting the filaments of the spun bonded fabric during their deposition.

3. The method as defined in claim 2 which further comprises

directing gaseous jets onto the web of applied filaments for compaction of the spun bonded lamina.

4. The method as defined in claim 2 which further includes passing the web of applied filaments and textile fabric between pressure rollers for such compaction.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,904,455 Dated September 9, 1975

Inventor(s) Daniel S. Goldman

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1,

Line 48, after "bonded", "now" should be - non -

Signed and Sealed this

sixteenth Day of December 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks