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División de Nuevas Creaciones

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71. SOLICITANTE Polymer Group Inc.

DOMICILIO Estados Unidos de America.

74. APODERADO Mauricio Pinzon Pinzon.

22. BOGOTÁ, D. C.,

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SUPERINTENDENCIA

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① SOLICITUD DE : ☒ Patente de Invención. ☐ Patente de Modelo de Utilidad. ☒ Capítulo I. ☐ Capítulo II.			
② SOLICITANTE (71)	Nombre: POLYMER GROUP INC Dirección: 4050 FABER PLACE DRIVE SUITE 201, NORTH CHARLESTON SC 29405 Nacionalidad o Domicilio: ESTADOS UNIDOS Lugar de Constitución: ESTADOS UNIDOS. Teléfono: 8 762020 Fax: E-mail:	IDENTIFICACIÓN C.C. ☐ NT ☐ C.E. ☐ Otro ☐ Cual _____ Número _____	
③ REPRESENTANTE O APODERADO	Nombre: MAURICIO PINZON PINZON Dirección: CALLE 99 NO. 12-39 P 4 Teléfono: 6219721 Fax: 6 219671 E-mail: pinzonpinzonapinzonpinzon.com	IDENTIFICACIÓN C.C. ☒ NT ☐ C.E. ☐ Otro ☐ Cual _____ Número 79145527 TP37230	
④ INVENTOR (ES) (72)	Nombre: HARTGROVE, HERBERT P. / CARTER, NICK, M. * TINDALL, RUSSELL / MCNAULL, CYNTHIA DAWSON. Dirección: 193, FRANCIS DRIVE, DUNN, NC 27012 / 121 WEST 14 TH, HUTCHINSON, KS 67501 / 4861 HEARTHSTONE ROAD CLE MMONS, NC 27012 / 6113 CLAIRIDGE ROAD, WILMINGTON NC 28403 Nacionalidad o Domicilio: ESTADOS UNIDOS DE AMERICA.		
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⑥ Título (54) <u>REFUERZO SECUNDARIO NO TEJIDO ANTIACUSTICO PARA</u> <u>ALFOMBRAS.</u>			
⑦ Clasificación Internacional (51) _____			
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Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página.

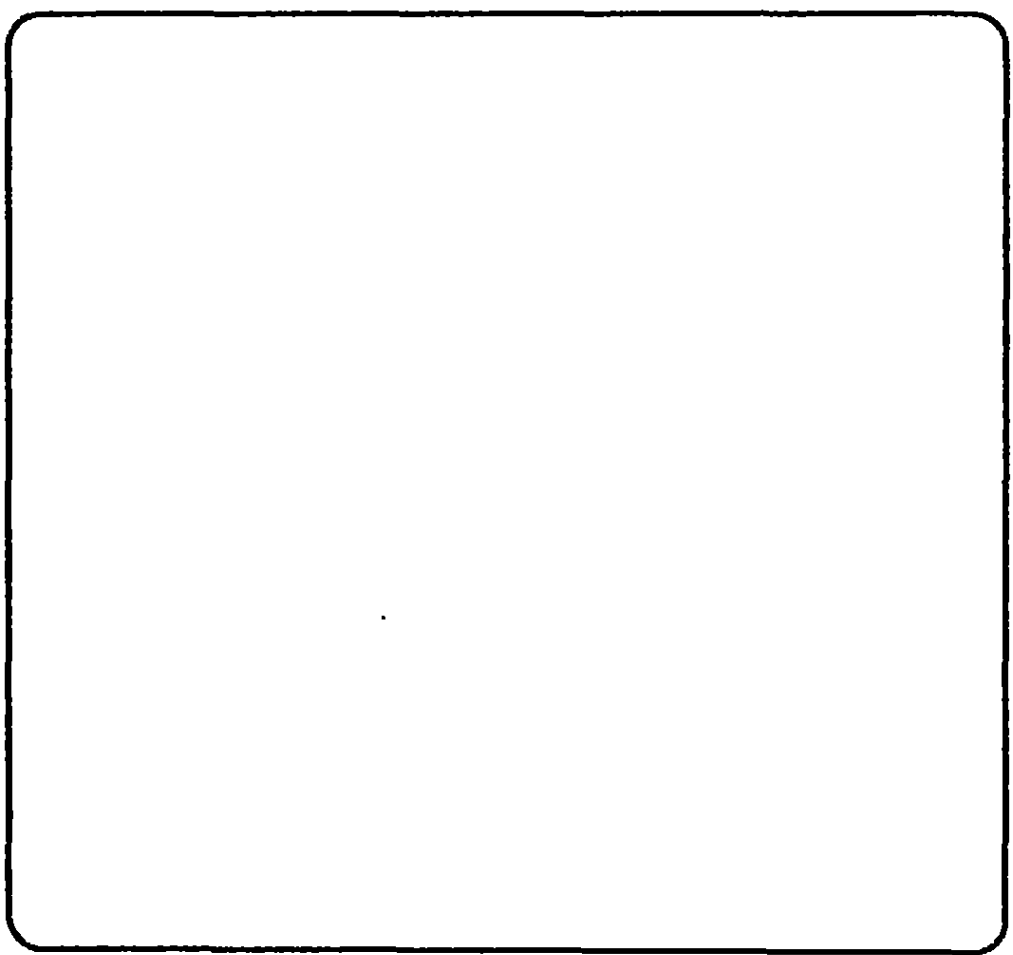
10

ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica
- ☒ Poderes, si fuere el caso. (EXP . 06 - 18 . 630)
- ☒ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen Preliminar (IPEA)
- ☐ Traducción del examen preliminar internacional efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico
- ☐ Arte final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☐ De ser el caso, modificaciones efectuadas a la solicitud internacional
- ☐ Otros

11

FIGURA CARACTERÍSTICA:



12

Solicito la concesión de la patente,

NOMBRE: MAURICIO PINZON PINZON

FIRMA:

C.C.79.145.527 T.P37.230 C.S. de J.

Instrucciones para la presentación de los anexos, ver reverso de esta página.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

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Eve: 378 FASENACIONALI
Act 411 PRESENTACION Folio 72

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	Nº. PAGO	FECHA PGO	VR. PAGO
PINZON PINZON ASOC.	CONSIGNACION	BANCO POPULAR	050-00110-6	54384420	15/08/2006	1,638,000.00
PINZON PINZON ASOC.	CONSIGNACION	BANCO POPULAR	050-00110-6	55646469	15/08/2006	926,000.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	463,000.00
		TOTAL :	463,000.00

SON: CUATROCIENTOS SESENTA Y TRES MIL PESOS

RESPONSABLE : 

BO DE CAJA APLICADO AL EXPEDIENTE No. _____

P616044P3021CO

STATE OF NORTH CAROLINA



Department of The
Secretary of State

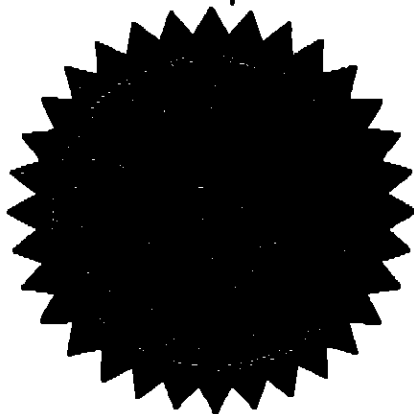
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2. This Public Document
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CERTIFIED

5. at Raleigh, North Carolina
6. the 26TH DAY OF JUNE, 2006
7. by Secretary of State or Deputy Secretary of State, State of North Carolina
8. No. 14985
9. Seal/Stamp
10. Signature



by:

Rodney S. Maddox
RODNEY S. MADDOX
Chief Deputy Secretary of State

Elaine J. Marshall

Secretary of State

POWER OF ATTORNEY

Be it known that

Valerie Calloway, Esq.

Legally representing and acting on behalf of

Polymer Group Inc.

a corporation addressed in

4055 Faber Place Dr., Suite 201
North Charleston, SC 29405
United States

does hereby grant **GENERAL POWER OF ATTORNEY** to:

MAURICIO PINZON PINZON
SOFIA RODRIGUEZ MORENO
SILVIA GARCIA CHACON

Lawyers in practice, of legal age, residing in Bogota D.C., Republic of Colombia, so that they may act in his own name and representation in order to carry out all the necessary steps and processes before the judicial, administrative and other authorities of the Republic of Colombia and the other Latin American Countries, as well as before third persons or parties in order to:

1) Obtain the registration and or protection of the Intellectual Property Rights such as trademarks, industrial designs, utility models, patents, commercial names and ensigns, copyrights, domain names, including all the steps, procedures and actions necessary for their defense, protection and conservancy, including the capability of granting licenses and to assign registrations.

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FIRMA: Valerie Calloway
(Signature) Valerie Calloway
Assistant Secretary, Chief Intellectual Property Counsel

CERTIFICACION NOTARIAL – SOCIEDAD
Como Notario Público certifico que:
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existe y se encuentra organizada de acuerdo con las leyes de este país / estado/

(Notary certificate – Corporation or Company)

The undersigned Notary Public, certifies that: POLYMER GROUP INC.

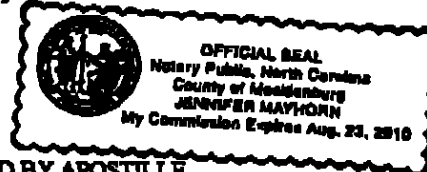
The above mentioned Company / exists and is organized in accordance with the Laws of this Country / State /

y la persona que en su representación suscribe el presente mandato cuenta con las debidas facultades para representarla en este acto.

/and the person who executed the foregoing document is the authorized representative of said Corporation / Company and is empowered to execute this document on its behalf.

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Jennifer Mayhorne
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PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING
TRANSMITTAL OF COPY OF INTERNATIONAL
APPLICATION AS PUBLISHED OR REPUBLISHED

To:

GEIMER, Stephen, D.
Wood, Phillips, Katz, Clark & Mortimer
Suite 3000
500 West Madison
Chicago, IL 60661-2502
ETATS-UNIS D'AMERIQUE

RECEIVED
SEP 13 2005
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Date of mailing (day/month/year)
25 August 2005 (25.08.2005)

Applicant's or agent's file reference
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PCT/US2005/003222

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04 February 2004 (04.02.2004)

Applicant
POLYMER GROUP, INC.

The International Bureau transmits herewith the following documents:

- ☒ copy of the international application as published by the International Bureau on 25 August 2005 (25.08.2005) under No. WO 2005/076885
- ☐ copy of international application as republished by the International Bureau on under No. WO
- For an explanation as to the reason for this republication of the international application, reference is made to INID codes (15), (48) or (88) (as the case may be) on the front page of the attached document.

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(74) Agent: GEIMER, Stephen, D.; Wood, Phillips, Katz, Clark & Mortimer, Suite 3800, 500 West Madison, Chicago, IL 60661-2562 (US).

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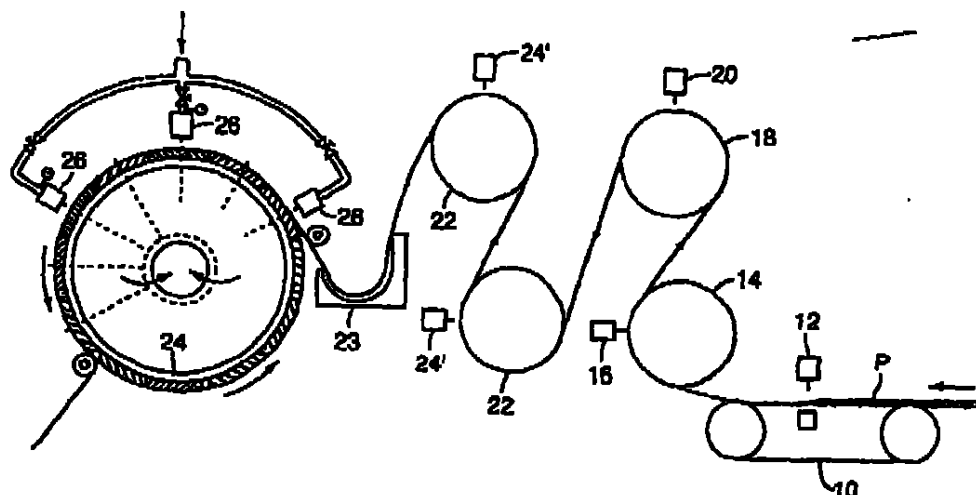
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(54) Title: SOUND ABSORBING SECONDARY NONWOVEN CARPET BACKING



(57) Abstract: The present invention is directed to methods of making a sound absorbing secondary carpet backing, and more particularly, to a method of manufacturing a nonwoven fabric exhibiting a durable three-dimensional image, permitting use of the fabric in secondary carpet backing systems so as to reduce deformation under normal use (walking), increase absorption of sound, and improve the amount of coverage provided to the secondary carpet backing system applications.

WO 2005/076865 A2

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

SOUND ABSORBING SECONDARY NONWOVEN CARPET BACKING

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the priority of Provisional Application No. 60/541,742, which was filed on February 4, 2004, and the disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The present invention relates generally to methods of making a sound absorbing secondary carpet backing, and more particularly, to a method of manufacturing a nonwoven fabric exhibiting a durable three-dimensional image, permitting use of the fabric in secondary carpet backing systems so as to reduce deformation under normal use (walking), increase absorption of sound, and improve the amount of coverage provided to the secondary carpet backing system applications.

BACKGROUND OF THE INVENTION

[0003] The production of conventional textile fabrics is known to be a complex, multi-step process. The production of fabrics from staple fibers begins with the carding process whereby the fibers are opened and aligned into a feedstock referred to in the art as "sliver". Several strands of sliver are then drawn multiple times on a drawing frames to; further align the fibers, blend, improve uniformity and reduce the sliver's diameter. The drawn sliver is then fed into a roving frame to produce roving by further reducing its diameter as well as imparting a slight false twist. The roving is then fed into the spinning frame where it is spun into yarn. The yarns are next placed onto a winder where they are transferred into larger packages. The yarn is then ready to be used to create a fabric.

[0004] For a woven fabric, the yarns are designated for specific use as warp or fill yarns. The fill yarns (which run on the y-axis and are known as picks) are taken straight to the loom for weaving. The warp yarns (which run on the x-axis and are known as ends) must be further processed. The large packages of yarns are placed onto a warper frame and are wound onto a section beam where they are aligned parallel to each other. The section beam is then fed into a slasher where a size is applied to the yarns to make them stiffer and more abrasion resistant, which is required to withstand the weaving process. The yarns are wound onto a loom beam

as they exit the slasher, which is then mounted onto the back of the loom. The warp yarns are threaded through the needles of the loom, which raises and lowers the individual yarns as the filling yarns are interlaced perpendicular in an interlacing pattern thus weaving the yarns into a fabric. Once the fabric has been woven, it is necessary for it to go through a scouring process to remove the size from the warp yarns before it can be dyed or finished. Currently, commercial high-speed looms operate at a speed of 1000 to 1500 picks per minute, where a pick is the insertion of the filling yarn across the entire width of the fabric. Sheeting and bedding fabrics are typically counts of 80x80 to 200x200, being the ends per inch and picks per inch, respectively. The speed of weaving is determined by how quickly the filling yarns are interlaced into the warp yarns, therefore looms creating bedding fabrics are generally capable of production speeds of 5 inches to 18.75 inches per minute.

[0005] In contrast, the production of nonwoven fabrics from staple fibers is known to be more efficient than traditional textile processes, as the fabrics are produced directly from the carding process.

[0006] Nonwoven fabrics are suitable for use in a wide variety of applications where the efficiency with which the fabrics can be manufactured provides a significant economic advantage for these fabrics versus traditional textiles. However, nonwoven fabrics have commonly been disadvantaged when fabric properties are compared to conventional textiles, particularly in terms of resistance to elongation, in applications where both transverse and co-linear stresses are encountered. Hydroentangled fabrics have been developed with improved properties, by the formation of complex composite structures in order to provide a necessary level of fabric integrity. Subsequent to entanglement, fabric durability has been further enhanced by the application of binder compositions and/or by thermal stabilization of the entangled fibrous matrix.

[0007] Nonwoven composite structures typically improve physical properties, such as elongation, by way of incorporation of a support layer or scrim. The support layer material can comprise an array of polymers, such as polyolefins, polyesters, polyurethanes, polyamides, and combinations thereof; and take the form of a film, fibrous sheeting, or grid-like meshes. Metal screens, fiberglass, and vegetable fibers are also utilized as support layers. The support layer is commonly

incorporated either by mechanical or chemical means to provide reinforcement to the composite fabric. Reinforcement layers, also referred to as a "scrim" material, are described in detail in U.S. Patent No. 4,636,419, which is hereby incorporated by reference. The use of scrim material, more particularly, a spunbond scrim material is known to those skilled in the art.

[0008] Spunbond material comprises continuous filaments typically formed by extrusion of thermoplastic resins through a spinneret assembly, creating a plurality of continuous thermoplastic filaments. The filaments are then quenched and drawn, and collected to form a nonwoven web. Spunbond materials have relatively high resistance to elongation and perform well as a reinforcing layer or scrim. U.S. Patent No. 3,485,706 to Evans, et al., which is hereby incorporated by reference, discloses a continuous filament web with an initial random staple fiber batt mechanically attached via hydroentanglement, then a second random staple fiber batt is attached to the continuous filament web, again, by hydroentanglement. A continuous filament web is also utilized in U.S. Patents No. 5,144,729; No. 5,187,005; and No. 4,190,695. These patents include a continuous filament web for reinforcement purposes or to reduce elongation properties of the composite.

[0009] More recently, hydroentanglement techniques have been developed which impart images or patterns to the entangled fabric by effecting hydroentanglement on three-dimensional image transfer devices. Such three-dimensional image transfer devices are disclosed in U.S. Patent No. 5,098,764, which is hereby incorporated by reference; with the use of such image transfer devices being desirable for providing a fabric with enhanced physical properties as well as functional dimension.

[0010] A three-dimensionally imaged nonwoven fabric exhibits a combination of specific physical characteristics so as to be beneficial in carpet backing applications. Further, three-dimensionally imaged nonwoven fabrics used in industrial applications require sufficient resistance to elongation so as to resist deformation of the image when the fabric is converted into a final end-use article and when used in the final application.

[0011] Heretofore, nonwoven fabrics have been advantageously employed for manufacture of secondary carpet backing. Generally, nonwoven fabrics employed

for this type of application have been entangled and integrated by mechanical needle-punching, sometimes referred to as "needle-felting", which entails repeated insertion and withdrawal of barbed needles through a fibrous web structure. While this type of processing acts to integrate the fibrous structure and lend integrity thereto, the barbed needles inevitably shear large numbers of the constituent fibers, and undesirably create perforations in the fibrous structure, which act to compromise the integrity of the carpet backing and can inhibit proper coverage. Needle-punching can also be detrimental to the strength of the resultant fabric, requiring that a suitable nonwoven fabric have a higher basis weight in order to exhibit sufficient strength for secondary carpet backing applications.

[0012] Notwithstanding various attempts in the prior art to develop a sound absorbing secondary carpet backing for carpet systems, a need continues to exist for a nonwoven fabric, which provides a pronounced image for increased resistance against deformation under normal wear, such as walking.

SUMMARY OF THE INVENTION

[0013] The present invention is directed to methods of making a sound absorbing secondary carpet backing, and more particularly, to a method of manufacturing a nonwoven fabric exhibiting a durable three-dimensional image, permitting use of the fabric in secondary carpet backing systems so as to reduce deformation under normal use (walking), increase absorption of sound, and improve the amount of coverage provided to the secondary carpet backing system applications.

[0014] In particular, the present invention contemplates that a sound absorbing secondary carpet backing fabric is formed from a precursor web comprising a spunbond and/or cast scrim, which when subjected to hydroentanglement on an imaging surface, an enhanced product is achieved. By formation in this fashion, hydroentanglement of the precursor web results in a fabric with a more pronounced three-dimensional image; an image that is durable to abrasion and distortion, producing a fabric suitable for secondary carpet backing that also reduces the amount of noise by absorbing sound.

[0015] In accordance with the present invention, a method of making a nonwoven fabric embodying the present invention includes the steps of providing a

precursor web comprising a fibrous matrix. While use of staple length fibers is typical, the fibrous matrix may comprise substantially continuous filaments. In a particularly preferred form, the fibrous matrix comprises staple length fibers, which are carded and cross-lapped to form a precursor web. In one embodiment of the present invention, the precursor web is subjected to pre-entangling on a foraminous-forming surface prior to juxtaposition of a continuous filament and /or cast scrim and subsequent three-dimensional imaging. Alternately, one or more layers of fibrous matrix are juxtaposed with one or more continuous filament and/or cast scrims, then the layered construct is pre-entangled to form a precursor web which is imaged directly, or subjected to further fiber, filament, support layers, or scrim layers prior to imaging.

[0016] The present method further contemplates the provision of a three-dimensional image transfer device having a movable imaging surface. In a typical configuration, the image transfer device may comprise a drum-like apparatus, which is rotatable with respect to one or more hydroentangling manifolds.

[0017] The precursor web is advanced onto the imaging surface of the image transfer device. Hydroentanglement of the precursor web is effected to form a three-dimensionally imaged fabric. Significantly, the incorporation of at least one continuous filament or cast scrim acts to focus the fabric tension therein, allowing for improved imaging of the staple fiber layer or layers, and resulting in a more pronounced three-dimensional image.

[0018] Subsequent to hydroentanglement, the three-dimensionally imaged fabric may be subjected to one or more variety of post-entanglement treatments. Such treatments may include application of a polymeric binder composition, mechanical compacting, application of additives or electrostatic compositions, and like processes.

[0019] A further aspect of the present invention is directed to a method of forming a durable nonwoven fabric, which exhibits a pronounced and resilient three-dimensionality, while providing the necessary resistance to distortion, to facilitate use in a wide variety of industrial applications. The fabric exhibits a high degree of fiber retention, thus permitting its use in those applications in which the fabric is used as a secondary carpet backing in carpet backing systems. Further, the scrim

aids in preventing the distortion of the imprinted image upon the application of tension to the composite fabric during routine processing and use.

[0020] A method of making the present durable nonwoven fabric comprises the steps of providing a precursor web, which is subjected to hydroentangling. The precursor web is formed into a three-dimensionally imaged nonwoven fabric by hydroentanglement on a three-dimensional image transfer device. The image transfer device defines three-dimensional elements against which the precursor web is forced during hydroentanglement, whereby the fibrous constituents of the web are imaged by movement into regions between the three-dimensional elements and surface asperities of the image transfer device.

[0021] In the preferred form, the precursor web is hydroentangled on a foraminous surface prior to hydroentangling on the imaging surface. This pre-entangling of the precursor web acts to integrate the fibrous components of the web, but does not impart a three-dimensional image as can be achieved through the use of the three-dimensional image transfer device.

[0022] Optionally, subsequent to three-dimensional imaging, the imaged nonwoven fabric can be treated with a performance or aesthetic modifying composition to further alter the fabric structure or to meet end-use article requirements. A polymeric binder composition can be selected to enhance durability characteristics of the fabric or an antimicrobial additive may be used utilized to deter the growth of fungus and mold.

[0023] The nonwoven fabric of the present invention is utilized as a secondary carpet backing and exhibits sound absorption properties that were tested according to ASTM E1050 for normal incidence sound absorption and normal incidence transmission loss. Test results are provided in Tables 1 and 2.

[0024] Other features and advantages of the present invention will become readily apparent from the following detailed description, the accompanying drawings, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] FIGURE 1 is a diagrammatic view of an apparatus for manufacturing a durable nonwoven fabric, embodying the principles of the present invention;

DETAILED DESCRIPTION

[0025] While the present invention is susceptible of embodiment in various forms, there is shown in the drawings, and will hereinafter be described, a presently preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as an exemplification of the invention, and is not intended to limit the invention to the specific embodiment illustrated.

[0027] The present invention is directed to a method of forming a durable three-dimensionally imaged nonwoven suitable for use as sound absorbing secondary carpet backing for carpet backing systems wherein the three-dimensional imaging of the fabrics is enhanced by the incorporation of at least one continuous filament support layer and/or cast scrim. Enhanced imaging can be achieved utilizing various techniques, one such technique involves minimizing and eliminating tension in the overall precursor web as the web is advanced onto a moveable imaging surface of the image transfer device, as represented by co-pending U.S. patent application, Ser. No. 60/344,259 to Putnam et al, entitled *Nonwoven Fabrics Having a Durable Three-Dimensional Image*, and filed on December 28, 2002, which is hereby incorporated by reference. By use of a continuous filament support layer or scrim, cast scrim, or the combination thereof, enhanced fiber entanglement is achieved, with the physical properties, both aesthetic and mechanical, of the resultant fabric being desirably enhanced. It is reasonably believed that the internal support of the precursor web provided by the support layer or scrim, as the precursor web is advanced onto the image transfer device, desirably acts to focus tension to the support layer or scrim. Without tension, the fibers or filaments of the fibrous matrix, from which the precursor web is formed, can more easily move and shift during hydroentanglement, thus resulting in improved three-dimensional imaging on the image transfer device. A more clearly defined and durable image is achieved.

[0028] With reference to FIGURE 1, therein is illustrated an apparatus for practicing the present method for forming a nonwoven fabric. The fabric is formed from a fibrous matrix, which typically comprises staple length fibers, but may comprise substantially continuous filaments. The fibrous matrix is preferably carded and cross-lapped to form a fibrous batt, designated F. In a current embodiment, the fibrous batt comprises 100% cross-lap fibers, that is, all of the fibers of the web have

been formed by cross-lapping a carded web so that the fibers are oriented at an angle relative to the machine direction of the resultant web. U.S. Patent No. 5,475,903, hereby incorporated by reference, illustrates a web drafting apparatus.

[0029] A continuous filament support layer or scrim, cast scrim, or a combination thereof, is then placed in face to face to face juxtaposition with the fibrous web and hydroentangled to form precursor web P. Alternately, the fibrous web can be hydroentangled first to form precursor web P, and subsequently, at least one support layer or scrim is applied to the precursor web, and the composite construct optionally further entangled with non-imaging hydraulic manifolds, then imparted a three-dimensional image on an imaging surface.

[0030] FIGURE 1 further illustrates a hydroentangling apparatus for forming nonwoven fabrics in accordance with the present invention. The apparatus includes a foraminous-forming surface in the form of belt 10 upon which the precursor web P is positioned for pre-entangling by entangling manifold 12. Pre-entangling of the precursor web, prior to three-dimensional imaging, is subsequently effected by movement of the web P sequentially over a drum 14 having a foraminous-forming surface, with entangling manifold 16 effecting entanglement of the web. Further entanglement of the web is effected on the foraminous forming surface of a drum 18 by entanglement manifold 20, with the web subsequently passed over successive foraminous drums 20, for successive entangling treatment by entangling manifolds 24', 24'.

[0031] The entangling apparatus of FIGURE 1 includes a three-dimensional imaging drum 24 comprising a three-dimensional image transfer device for effecting imaging of the now-entangled precursor web. The image transfer device includes a moveable imaging surface which moves relative to a plurality of entangling manifolds 28 which act in cooperation with three-dimensional elements defined by the imaging surface of the image transfer device to effect imaging and patterning of the fabric being formed.

[0032] The present invention contemplates that the support layer or scrim be any such suitable continuous filament nonwoven material, cast scrim, or combination thereof, including, but not limited to a spunbond fabric, a spunbond-meltblown laminate, or a spunbond-spunbond laminate, which exhibit low elongation

performance. A particularly preferred embodiment of support layer or scrim is a thermoplastic spunbond nonwoven fabric. The support layer may be maintained in a wound roll form, which is then continuously fed into the formation of the precursor web, and/or supplied by a direct spinning beam located in advance of the three-dimensional imaging drum 24.

[0033] Manufacture of a durable nonwoven secondary carpet backing fabric embodying the principles of the present invention is initiated by providing the fibrous matrix, which can include the use of staple length fibers, continuous filaments, and the blends of fibers and/or filaments having the same or different composition.

Fibers and/or filaments are selected from natural or synthetic composition, of homogeneous or mixed fiber length. Suitable natural fibers include, but are not limited to, cotton, wood pulp and viscose rayon. Synthetic fibers, which may be blended in whole or part, include thermoplastic and thermoset polymers.

Thermoplastic polymers suitable for blending with dispersant thermoplastic resins include polyolefins, polyamides and polyesters. The thermoplastic polymers may be further selected from homopolymers; copolymers, conjugates and other derivatives including those thermoplastic polymers having incorporated melt additives or surface-active agents. Staple lengths are selected in the range of 0.25 inch to 10 inches, the range of 1 to 3 inches being preferred and the fiber denier selected in the range of 1 to 22, the range of 1.2 to 6 denier being preferred for general applications. The profile of the fiber and/or filament is not a limitation to the applicability of the present invention.

EXAMPLES

Comparative Example 1

[0034] Using a forming apparatus as illustrated in FIGURE 1, a nonwoven fabric was made by providing a precursor web comprising 100 weight percent polypropylene fibers. The web had a basis weight of 3 ounces per square yard (plus or minus 7%). The precursor web was 100% carded and cross-lapped, with a draft ratio of 2.5 to 1.

[0035] Prior to three-dimensional imaging of the precursor web, the web was entangled by a series of entangling manifolds such as diagrammatically illustrated in FIGURE 1. FIGURE 1 illustrates disposition of precursor web P on a foraminous

forming surface in the form of belt 10, with the web acted upon by an entangling manifold 12. The web then passes sequentially over a drum 14 having a foraminous forming surface, for entangling by entangling manifold 16, with the web thereafter directed about the foraminous forming surface of a drum 18 for entangling by entanglement manifold 20. The web is thereafter passed over successive foraminous drums 22, with successive entangling treatment by entangling manifolds 24, 24'. In the present examples, each of the entangling manifolds included 120 micron orifices spaced at 42.3 per inch, with the manifolds successively operated at 100, 300, 700, and 1300 pounds per square inch, with a line speed of 45 yards per minute. A web having a width of 72 inches was employed.

[0036] The entangling apparatus of FIGURE 1 further includes a three-dimensional imaging drum 24 comprising a three-dimensional image transfer device for effecting imaging and patterning of the now-entangled precursor web. The entangling apparatus includes a plurality of entangling manifolds 26, which act in cooperation with the three-dimensional image transfer device of drum 24 to effect patterning of the fabric. In the present example, the imaging manifolds 26 were successively operated at 2800, 2800, and 2800 pounds per square inch, at a line speed which was the same as that used during pre-entanglement.

Example 1

[0037] A three-dimensionally imaged nonwoven fabric was manufactured by a process as described in Comparative Example 1, wherein in the alternative, and in accordance with the present invention, a lighter 1.5 ounce per square yard polyester staple fiber web was juxtaposed with a 1.5 ounce polyester spunbond web of approximately 2.0 denier. The staple fiber web/spunbond web layered matrix was then subjected to equivalent hydraulic pressures as described in Comparative Example 1.

[0038] The imaged nonwoven fabrics made in accordance with the present invention exhibit greater three-dimensional image clarity and are more pronounced than the image imparted to equivalent basis weight materials without the support layer or scrim. Imaged nonwoven fabrics, such as Example 1, exhibit a significantly reduced elongation performance, resulting in improved image retention during mechanical processing and use.

[0039] The material of the present invention may be utilized as a sound absorbing secondary carpet backing as well as provide for backing material of various floor systems, including floating laminate floor systems, and other end use products where a three-dimensionally imaged nonwoven fabric can be employed. The sound absorbing properties of the secondary carpet backing were tested according to ASTM E1050 for normal incidence sound absorption and normal incidence transmission loss. At 1/3 octave center frequency ranges of 63 Hz – 200 Hz, 250 Hz – 1,000 Hz, and 1,250 Hz – 4,000 Hz, the secondary carpet backing preferably exhibits respective sound absorption ranges of 0.02 dB – 0.06 dB, 0.07 dB – 0.19 dB, and 0.25 dB – 0.72 dB. Further, at 1/3 octave center frequency ranges of 125 Hz – 400 Hz, 500 Hz – 1,250 Hz, and 1,600 Hz – 4,000 Hz, the secondary carpet backing preferably exhibits respective normal incidence transmission loss (NI-TL) values of 7.3 dB – 8.8 dB, 9.3 dB – 10.7 dB, and 14.0 dB – 17.5 dB. Test results are provided in Tables 1 and 2.

[0040] In addition, the nonwoven secondary carpet backing of the present invention was tested in comparison to a woven polypropylene secondary carpet backing. Results show a noise reduction coefficient (NRC) of 0.17 dB for the woven substrate versus a 0.21 dB NRC for the nonwoven substrate, which is approximately a 20% improvement over the woven substrate. The sound transmission class (STC) was also tested with the woven substrate receiving a value of 7, while the nonwoven substrate of the present invention received a value of 13. The nonwoven secondary carpet backing demonstrates an approximate 50% improvement over the woven carpet backing when tested beneath carpets of comparable weights.

[0041] Other end uses include; fabrication into acoustic wall systems, automotive applications, wet or dry hard surface wipes, which can be readily hand-held for cleaning and the like, protective wear for industrial uses, such as gowns or smocks, shirts, bottom weights, lab coats, face masks, and the like, and protective covers, including covers for vehicles such as cars, trucks, boats, airplanes, motorcycles, bicycles, golf carts, as well as covers for equipment often left outdoors like grills, yard and garden equipment, such as mowers and roto-tillers, lawn furniture, floor coverings, table cloths and picnic area covers.

[0042] From the foregoing, it will be observed that numerous modifications and variations can be affected without departing from the true spirit and scope of the novel concept of the present invention. It is to be understood that no limitation with respect to the specific embodiments illustrated herein is intended or should be inferred. The disclosure is intended to cover, by the appended claims, all such modifications as fall within the scope of the claims.

[0043]

TABLE 1

Normal Incidence Sound Absorption	
1/3 Octave (Hz)	Absorption
63	0.02
80	0.04
100	0.04
125	0.05
160	0.05
200	0.06
250	0.07
315	0.08
400	0.09
500	0.10
630	0.12
800	0.14
1,000	0.19
1,250	0.25
1,600	0.32
2,000	0.43
2,500	0.58
3,150	0.70
4,000	0.72

[0044]

TABLE 2

Normal Incidence Transmission Loss	
1/3 octave (Hz)	NI-TL (dB)
125	7.3
160	7.7
200	8.0
250	8.2
315	8.4
400	8.8
500	9.3
630	9.9
800	10.8
1,000	11.1
1,250	10.7
1,600	14.0
2,000	19.5
2,500	22.3
3,150	19.4
4,000	17.5

WHAT IS CLAIMED IS:

1. A method of making a sound absorbing secondary carpet backing fabric, comprising the steps of:

providing a fibrous matrix;

providing a support layer;

providing a foraminous surface;

juxtaposing said fibrous matrix and said support layer and applying hydraulic energy to entangle said fibrous matrix and said support layer into a precursor web; and

hydroentangling said precursor web on said foraminous surface to form a three-dimensionally imaged nonwoven fabric;

wherein said carpet backing exhibits normal incidence transmission loss (NI-TL) values of 7.3 dB – 8.8 dB, 9.3 dB – 10.7 dB, and 14.0 dB – 17.5 dB at respective 1/3 octave center frequency ranges of 125 Hz – 400 Hz, 500 Hz – 1,250 Hz, and 1,600 Hz – 4,000 Hz., and normal incidence sound absorption ranges of 0.02 dB – 0.06 dB, 0.07 dB – 0.19 dB, and 0.25 dB – 0.72 dB at respective 1/3 octave center frequency ranges of 63 Hz – 200 Hz, 250 Hz – 1,000 Hz, and 1,250 Hz – 4,000 Hz.

2. A sound absorbing secondary nonwoven carpet backing fabric comprising a fibrous matrix and a support layer comprising a continuous filament layer hydroentangled on a foraminous surface to impart at least one three-dimensional image into said nonwoven carpet backing fabric, wherein said carpet backing exhibits normal incidence transmission loss (NI-TL) values of 7.3 dB – 8.8 dB, 9.3 dB – 10.7 dB, and 14.0 dB – 17.5 dB at respective 1/3 octave center frequency ranges of 125 Hz – 400 Hz, 500 Hz – 1,250 Hz, and 1,600 Hz – 4,000 Hz., and normal incidence sound absorption ranges of 0.02 dB – 0.06 dB, 0.07 dB – 0.19 dB, and 0.25 dB – 0.72 dB at respective 1/3 octave center frequency ranges of 63 Hz – 200 Hz, 250 Hz – 1,000 Hz, and 1,250 Hz – 4,000 Hz.

3. A sound absorbing secondary nonwoven carpet backing fabric comprising a fibrous matrix and a support layer comprising a cast scrim hydroentangled on a foraminous surface to impart at least one three-dimensional image into said nonwoven carpet backing fabric, wherein said carpet backing exhibits normal incidence transmission loss (NI-TL) values of 7.3 dB – 8.8 dB, 9.3

dB – 10.7 dB, and 14.0 dB – 17.5 dB at respective 1/3 octave center frequency ranges of 125 Hz – 400 Hz, 500 Hz – 1,250 Hz, and 1,600 Hz – 4,000 Hz, and normal incidence sound absorption ranges of 0.02 dB – 0.06 dB, 0.07 dB – 0.19 dB, and 0.25 dB – 0.72 dB at respective 1/3 octave center frequency ranges of 63 Hz – 200 Hz, 250 Hz – 1,000 Hz, and 1,250 Hz – 4,000 Hz.

4. A sound absorbing secondary nonwoven carpet backing fabric in accordance with claim 1, wherein said foraminous surface is a three-dimensional image transfer device.

5. A sound absorbing secondary nonwoven carpet backing fabric in accordance with claim 1, wherein said fibrous matrix comprises staple length fibers.

6. A sound absorbing secondary nonwoven carpet backing fabric in accordance with claim 1, wherein said fibrous matrix comprises substantially continuous filaments.

7. A sound absorbing secondary nonwoven carpet backing fabric in accordance with claim 1, wherein said fibrous matrix is carded and crosslapped.

8. A sound absorbing secondary nonwoven carpet backing fabric in accordance with claim 1, wherein said support layer is a spunbond fabric.

9. A sound absorbing secondary nonwoven carpet backing fabric in accordance with claim 1, wherein said support layer is a spunbond fabric and cast scrim laminate.

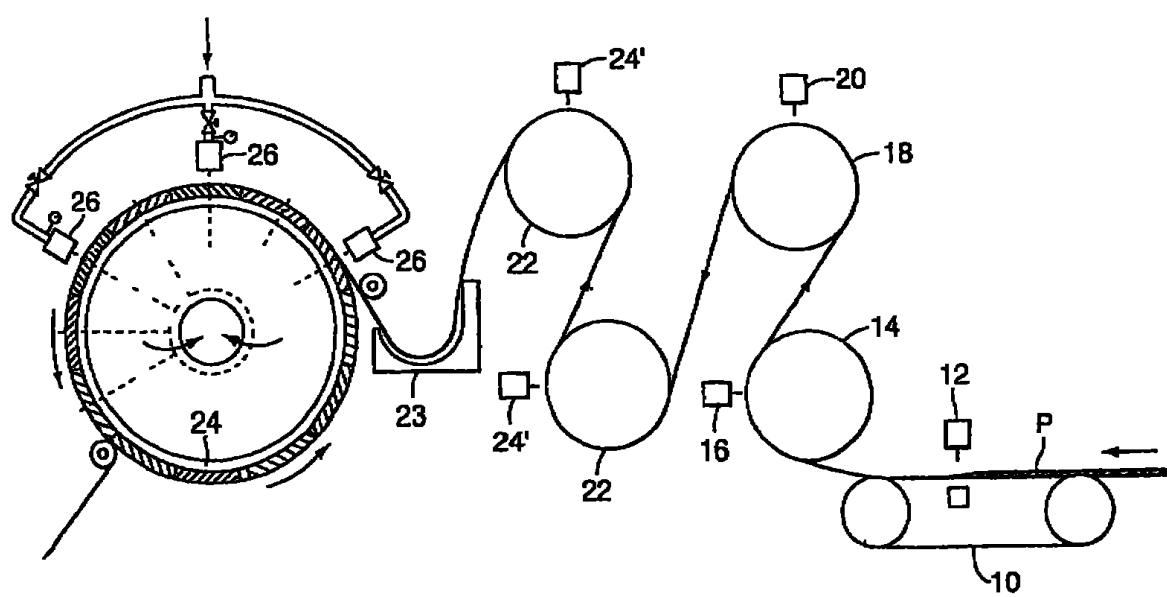


FIG. 1

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(54) Título:

REFUERZO SECUNDARIO NO TEJIDO ANTIACÚSTICO PARA ALFOMBRAS

(SOUND ABSORBING SECONDARY NONWOVEN CARPET BACKING)

(57) Resumen. En términos generales, la presente invención se refiere a métodos para hacer un refuerzo secundario no tejido antiacústico, y más en particular, a un método para la fabricación de una tela no tejida que exhiba una imagen tridimensional durable, permitiendo el uso de la tela en sistemas de refuerzo secundario para alfombras de modo que reduzca la deformación bajo uso normal (caminado), aumentar la absorción de sonido y mejorar la cantidad de cubrimiento provisto a las aplicaciones del sistema de refuerzo secundario de alfombras.

REFUERZO SECUNDARIO NO TEJIDO ANTIACÚSTICO PARA ALFOMBRAS

REFERENCIA CRUZADA A LA SOLICITUD

Esta solicitud reclama prioridad de la Solicitud Provisional No. 60/541,742, radicada el 4 de febrero de 2004 y cuya descripción se incorpora en este contexto por referencia.

CAMPO TÉCNICO

En términos generales, la presente invención se refiere a métodos para hacer un refuerzo secundario no tejido antiacústico, y más en particular, a un método para la fabricación de una tela no tejida que exhiba una imagen tridimensional durable, permitiendo el uso de la tela en sistemas de refuerzo secundario de alfombras de modo de reducir deformación bajo uso normal (caminado), aumentar la absorción de sonido y mejorar la cantidad de cubrimiento provisto a las aplicaciones del sistema de refuerzo secundario de alfombras

ANTERIORIDADES

Se sabe que la producción de textiles convencionales es un proceso complejo de pasos múltiples. La producción de telas de fibras discontinuas comienza con el proceso de cardado mediante el cual las fibras son abiertas y alineadas en una materia prima referida en la técnica como "plata". Varios cordones de plata son estirados múltiples veces en marcos de estirado para alinear más aún las fibras, mezclar, mejorar la uniformidad y reducir el diámetro de la plata. La plata estirada es luego alimentada a una mechera para producir mechas, reduciendo más aún su diámetro así como para impartir una leve torsión falsa. La mecha es luego alimentada en un marco de hilar donde es hilada en el hilado. Luego, se colocan los hilados en una devanadora donde son transferidos en paquetes más grandes. En este punto, el hilado está listo para ser utilizado para crear la tela.

Sin embargo, las telas no tejidas tienen una desventaja cuando las propiedades de la tela se comparan con textiles convencionales, en particular en términos de resistencia a alargamiento, en aplicaciones donde se encuentran tensiones tanto transversales como co-lineales. Las telas hidro-enmarañadas han sido desarrolladas con propiedades mejoradas, mediante la formación de estructura compuesta compleja con el fin de proveer un nivel necesario de integridad de la tela. Posteriormente al enmarañado, la durabilidad de la tela ha sido realzada aún más mediante las aplicaciones de composiciones aglutinantes y/o mediante estabilización térmica de la matriz fibrosa enmarañada.

Típicamente, estructuras compuestas no tejidas mejoran las propiedades físicas tales como alargamiento, por medio de la incorporación de una capa o tela de soporte. El material de la capa de soporte puede comprender una variedad de polímeros, tales como poliolefinas, poliésteres, poliuretanos, poliamidas y combinaciones de lo mismo, y tomar la forma de una película, tela fibrosa para sábanas o mallas en forma de rejilla. Tambores de tela metálica, fibra de vidrio y fibras vegetales también se usan como capas de soporte. Comúnmente, la capa de soporte es incorporada bien sea por medios mecánicos o químicos con el fin de proveer refuerzo a la tela compuesta. Las capas de refuerzo también se refieren como material de "soporte", según se describe en detalle en la Patente U.S. No. 4,636,419, la cual se incorpora en este contexto por referencia. Las personas versadas en la técnica conocen el uso de material de soporte, más en particular, un material de soporte unido por hilado.

El material unido por hilado comprende filamentos continuos formados típicamente por la extrusión de resinas termoplásticos a través de una tobera de hilatura, creando una pluralidad de filamentos termoplásticos continuos. Los filamentos son luego templados y estirados y recogidos para formar una red no tejida. Los materiales unidos por hilado tienen una resistencia relativamente alta a alargamiento y se comportan bien como capa de refuerzo o tela de soporte. La Patente U.S. No. 3,485,706 otorgada a Evans *et al*, la cual se incorpora a este contexto por referencia, describe una red de filamento continuo con una guata de

cual compromete la integridad del refuerzo de la alfombra y puede inhibir un cubrimiento adecuado. La perforación con agujas también puede ser perjudicial a la resistencia de la tela resultante, requiriendo que una tela no tejida adecuada tenga un peso de base más alto con el fin de que exhiba una resistencia suficiente para aplicaciones secundarias de refuerzo.

No obstante varios intentos en la técnica anterior para desarrollar un refuerzo secundario antiacústico para alfombras, persiste la necesidad de que exista una tela no tejida que provea una imagen pronunciada para resistencia aumentada contra deformación bajo desgaste normal, como caminado.

RESUMEN DE LA INVENCION

La presente invención se dirige a métodos para hacer un refuerzo secundario antiacústico para alfombras, y más en particular, a un método para fabricar una tela no tejida que exhiba una imagen tridimensional durable, permitiendo el uso de la tela en sistemas de refuerzo secundario para alfombras con el fin de reducir deformación bajo uso normal (caminado), aumentar la absorción de sonido y mejorar la cantidad de cubrimiento provisto a las aplicaciones de sistemas secundarios de refuerzo para alfombras.

En particular, la presente invención contempla hacer una tela de refuerzo secundario para alfombras a partir de una red precursora que comprende una tela unida por hilado y/o tela de soporte fundida, la cual cuando se somete a hidro-enmarañado sobre una superficie de imágenes, se logra un producto mejorado. Mediante la formación de este modo, el hidro-enmarañado de la red precursora resulta en una tela con una imagen tridimensional más pronunciada; una imagen que es durable contra abrasión y distorsión, produciendo una tela indicada para refuerzo secundario de alfombras que también reduce la cantidad de ruido absorbiendo el sonido.

Según la presente invención, un método para hacer una tela no tejida realizada en la presente invención incluye los pasos de proveer una red

polimérica, compactación mecánica, aplicación de aditivos o composiciones electrostáticas y procesos similares.

Oro aspecto de la presente invención se dirige a un método para formar una tela no tejida durable, la cual exhibe una tridimensionalidad pronunciada y flexible, al tiempo que ofrece la resistencia necesaria a distorsión, con el fin de facilitar el uso en una amplia variedad de aplicaciones industriales. La tela presenta un alto grado de retención de fibra, permitiendo de este modo su uso en aquellas aplicaciones en las que la tela es utilizada como un refuerzo secundario para alfombra en sistemas de refuerzo. Además, la tela de soporte ayuda a prevenir la distorsión de la imagen impresa con la aplicación de tensión a la tela compuesta durante el procesamiento y uso rutinarios.

Un método para hacer la tela no tejida durable de la presente invención comprende los pasos de proveer una red precursora la cual es sometida a hidro-enmarañado. La red precursora es formada en una tela no tejida con imagen tridimensional por medio de hidro-enmarañado en un dispositivo de transferencia de imagen tridimensional. El dispositivo de transferencia de imagen define elementos tridimensionales contra los cuales se forza la red precursora durante el proceso de hidro-enmarañado, mediante lo cual, los constituyentes fibrosos de la red son impresos en imagen mediante movimiento en las regiones entre los elementos tridimensionales y las asperezas superficiales del dispositivo de transferencia de imagen.

En la forma preferida, la red precursora es hidro-enmarañada en una superficie foraminosa antes de hidro-enmarañado sobre la superficie de la imagen. Este hidro-enmarañado de la red precursora actúa para integrar los componentes fibrosos de la red, pero no imparte una imagen tridimensional tal como se puede lograr mediante el uso del dispositivo de transferencia de imagen tridimensional.

Opcionalmente, posterior a la impresión de la imagen tridimensional, la tela no tejida estampada con imagen puede ser tratada con una composición modificadora estética o de funcionamiento que altere aún más la estructura de la

de las cuales implica minimizar y eliminar la tensión en toda la red precursora a medida que la red es avanzada en una superficie de imagen móvil del dispositivo de transferencia de imagen, tal como se representa en la solicitud de patente U.S. co-pendiente, Serie No. 60/344,259 de Putnam *et al*, titulada *Nonwoven Fabrics Having a Durable Three-Dimensional Image*, y radicada el 28 de diciembre de 2002, la cual se incorpora en este contexto por referencia. Mediante el uso de una capa o tela de soporte de filamento continuo, soporte fundido o combinación de lo anterior, se logra realzar el enmarañado de la fibra, realizándose ventajosamente las propiedades físicas, tanto estéticas como mecánicas, de la tela resultante. Se cree con razón que el soporte interno de la red precursora provisto por la capa o tela de soporte, a medida que la red precursora es avanzada en el dispositivo de transferencia de imagen, actúa ventajosamente para enfocar la tensión a la capa o tela de soporte. Sin la tensión, las fibras o filamentos de la matriz fibrosa de la cual se forma la red precursora, pueden moverse más fácilmente y trasladarse durante el proceso de hidro-enmarañado, resultando de este modo en un estampado de imagen tridimensional mejorado en el dispositivo de transferencia de imagen. Se logra una imagen durable y más claramente definida.

Con referencia a la FIGURA 1, allí se ilustra un aparato para practicar el presente método de formado de una tela no tejida. La tela es formada a partir de una matriz fibrosa, que típicamente comprende fibras de longitud discontinua, pero puede comprender filamentos sustancialmente continuos. Preferiblemente, la matriz fibrosa es cardada y traslapada para formar una guata fibrosa, designada (F). En una realización actual, la guata fibrosa comprende 100% de fibras de traslapo cruzado, es decir, todas las fibras de la red se han formado traslapando transversalmente una red cardada de modo que las fibras estén orientadas a un ángulo relativo a la dirección de la máquina de la red resultante. La Patente U.S. No. 5,475,903, la cual se incorpora en este contexto por referencia, ilustra un aparato de tiraje de red.

Luego se coloca una capa o tela de soporte de filamento continuo, soporte fundido o combinación de lo mismo, en yuxtaposición cara a cara con la red

de lo mismo, incluidos, sin limitar, a una tela unida por hilado, un laminado soplado por fusión unido por hilado, o un laminado unido por hilado-unido por hilado, que exhiben un funcionamiento bajo de alargamiento. Una realización especialmente preferida de una capa o tela de soporte es una tela no tejida termoplástico unida por hilado. La capa de soporte puede mantenerse en forma enrollada, que luego es alimentada continuamente en la formación de la red precursora y/o suministrada por un carretel de quimiohilatura directa localizado antes del tambor estampador de imágenes tridimensionales (24).

La manufactura de una tela de refuerzo secundario no tejido para alfombras que abarque los principios de la presente invención se inicia por medio de una matriz fibrosa, la cual puede incluir el uso de fibras de longitud discontinua, filamentos continuos y mezclas de fibras y/o filamentos que tengan la misma o diferente composición. Las fibras y/o los filamentos son seleccionados a partir de una composición natural o sintética, de longitud de fibra homogénea o mezclada. Fibras naturales adecuadas incluyen, más no se limitan a algodón, pulpa de madera y rayón viscosa. Las fibras sintéticas, que pueden ser mezcladas total o parcialmente, incluyen polímeros termoplásticos y termofraguados. Polímeros termoplásticos adecuados para ser mezclados con resinas termoplásticas dispersantes incluyen poliolefinas, poliamidas y poliésteres. Los polímeros termoplásticos pueden ser seleccionados además de homopolímeros, copolímeros, conjugados y otros derivados, incluidos los polímeros termoplásticos que tengan incorporados aditivos fundidos o agentes activos de superficie. Las longitudes discontinuas son seleccionadas en el rango de 0,25 pulg. A 10 pulg. Prefiriéndose el rango de 1 a 3 pulgadas y la fibra denier seleccionada, en el rango de 1 a 22, prefiriéndose el rango denier de 1,2 a 6 para aplicaciones generales. El perfil de la fibra y/o filamento no es una limitación para la aplicabilidad de la presente invención.

cuales actúan en cooperación con el dispositivo de transferencia de imagen tridimensional del tambor (24) para hacer el estampado del patrón de la tela. En el presente ejemplo, los distribuidores de estampado de imágenes (26) fueron operados sucesivamente a 2800, 2800 y 2800 libras por pulgada cuadrada, a una velocidad de línea que era la misma que se usó durante el proceso de pre-enmarañado.

pérdida de transmisión de incidencia normal (NI-TL) de 7,3 dB-8,8 dB, 9,3 dB-10,7 dB y 14,0 dB-17,5 dB. Las Tablas 1 y 2 muestran los resultados.

Además, el refuerzo secundario no tejido para alfombras de la presente invención se probó en comparación con un refuerzo secundario tejido de polipropileno para alfombras. Los resultados muestran un coeficiente de reducción de ruido (NRC) de 0,17 dB para el substrato tejido frente a 0,21 dB NRC para el substrato no tejido, lo cual es aproximadamente una mejora de 20% sobre el substrato tejido. También se probó la clase de transmisión de sonido (STC) recibiendo el substrato no tejido un valor de 7, mientras que el substrato no tejido de la presente invención recibió un valor de 13. El refuerzo secundario no tejido para alfombras demuestra una mejora aproximada de 50% sobre el refuerzo tejido para alfombras cuando se probaron bajo alfombras de pesos comparables.

Otros usos finales incluyen: fabricación en sistemas acústicos de pared, aplicaciones para automotores, paños para superficie dura húmeda o seca, que pueden cogerse con la mano para limpieza y similares, ropa protectora para usos industriales, tales como vestidos, blusas, camisas, batas de laboratorio, máscaras y similares y cubiertas protectoras, incluidas cubiertas para vehículos tales como automóviles, camiones, botes, aeroplanos, motocicletas, bicicletas, carritos de golf, así como para equipo que se deje a la intemperie como parrillas, equipo de patio y jardín, tales como segadoras y roto-cultivadores, muebles para jardín, cubiertas para piso, manteles y cubiertas para el área de picnic.

A partir de lo anterior se podrá observar que se pueden hacer varias modificaciones y variaciones sin salirse del verdadero espíritu y alcance del concepto novedoso de la presente invención. Debe entenderse que en este contexto no se pretende hacer ni se debe inferir ninguna limitación con respecto a las realizaciones ilustradas. La descripción pretende cubrir, por medio de las reivindicaciones adjuntas, todas dichas modificaciones que caigan dentro del alcance de las reivindicaciones.

 Industria y Comercio SUPERINTENDENCIA	SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DIVISION DE NUEVAS CREACIONES EXTRACTO PARA PUBLICACIÓN SOLICITUD DE PATENTE DE INVENCION
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(21) N° de solicitud: 22) Fecha de solicitud: (30) Prioridad (31) No. Prioridad 32) Fecha (33) País 60/544.740 04-02-04 USA	(51) Int Cl: (71) Solicitante(s) (72) Inventor(es) (74) Apoderado:
(54) Título: Refuerzo Secundario No Tejido Antiacustico Para Alfombras.	

Resumen - Reivindicación(es): Ver Anexo

TABLA 1

Pérdida de Transmisión incidencia normal	
1/3 octava (Hz)	NI-TL (dB)
125	7,3
160	7,7
200	8,0
250	8,2
315	8,4
400	8,8
500	9,3
630	9,9
800	10,8
1,000	11,1
1,250	10,7
1,600	14,0
2,000	19,5
2,500	22,3
3,150	19,4
4,000	17,5

dB, y 0,25 dB – 0,72 dB en respectivos rangos de frecuencia central de 1/3 octava de 63 Hz – 200 Hz, 250 Hz-1,000 Hz y 1,250 Hz – 4,000 Hz.

3. Una tela de refuerzo secundaria antiacústica no tejida para alfombras que comprende una matriz fibrosa y una capa de soporte que comprende una tela de soporte fundida hidro-enmarañada sobre una superficie foraminosa para impartir al menos una imagen tridimensional a dicha tela de refuerzo no tejido para alfombras, en donde dicho refuerzo para alfombras exhibe valores de pérdida de transmisión de incidencia normal (NI-TK) de 7,3 dB – 8,8 dB, 9,3 – 10,7 dB y 14,0 dB-17,5 dB en respectivos rangos de frecuencia central de 1/3 octava de 125 Hz – 400 Hz, 500 Hz-1,250 Hz, y 1,600 Hz – 4,000 Hz y rangos de absorción de sonido de incidencia normal de 0,02 dB – 0,06 dB, 0,07 dB – 0,19 dB, y 0,25 dB – 0,72 dB en respectivos rangos de frecuencia central de 1/3 octava de 63 Hz-200 Hz, 250 Hz-1,000 Hz, y 1,250 Hz-4,000 Hz.

4. Una tela de refuerzo secundaria antiacústica no tejida para alfombras según la reivindicación 1, en donde dicha superficie foraminosa es un dispositivo de transferencia de imagen tridimensional.

5. Una tela de refuerzo secundaria antiacústica no tejida para alfombras, según la reivindicación 1, en donde dicha matriz fibrosa comprende fibras de longitud discontinua.

6. Una tela de refuerzo secundaria antiacústica no tejida para alfombras, según la reivindicación 1, en donde dicha matriz fibrosa comprende filamentos sustancialmente continuos.

7. Una tela de refuerzo secundaria antiacústica no tejida para alfombras, según la reivindicación 1, en donde dicha matriz fibrosa es cardada y traslapada transversalmente.

8. Una tela de refuerzo secundaria antiacústica no tejida para alfombras, según la reivindicación 1, en donde dicha capa de soporte es una tela unida por hilado

Traducción Oficial No. 10.436

TRADUCCIÓN NO. 10.436 DE UN DOCUMENTO ESCRITO EN INGLES,
realizada por María Mercedes Uricoechea T., Traductora/Intérprete Oficial
según Res. 10607 del 31 de diciembre de 1981 del Ministerio de Justicia.
Bogotá, 15 de agosto de 2006.

**DOCUMENTOS DE TRASPASO INVENCION SOLICITUD NÚMERO
11/050,283. Legalizaciones subsiguientes**

OFICINA DE MARCAS Y PATENTES DE ESTADOS UNIDOS

**SUBSECRETARIO DE COMERCIO DE PROPIEDAD INTELECTUAL
Y DIRECTOR DE LA OFICINA DE MARCAS Y PATENTES DE EE.UU.**

20 DE SEPTIEMBRE DE 2005.

WOOD, PHILLIPS, KATZ, CLARK & MORTIMER
CITICORP CENTER, SUITE 3800
500 WEST MADISON STREET
CHICAGO, IL 60661-2511

Sello recibido: 30 sept. 2005

**OFICINA DE MARCAS Y PATENTES DE ESTADOS UNIDOS
AVISO DE REGISTRO DE DOCUMENTO DE CESIÓN**

EL DOCUMENTO ADJUNTO HA SIDO REGISTRADO POR LA DIVISIÓN DE CESIONES DE LA
OFICINA DE MARCAS Y PATENTES DE EE.UU. EN LA SALA DE BÚSQUEDA SE ENCUENTRA
UNA COPIA MICROFILMADA COMPLETA EN EL NÚMERO DE CARRETEL Y MARCO QUE SE
INDICA ABAJO.

SÍRVANSE REVISAR TODA LA INFORMACIÓN QUE CONTIENE ESTE AVISO. LA
INFORMACIÓN QUE SE INCLUYE EN ESTE AVISO DE REGISTRO REFLEJA LOS DATOS
PRESENTES EN EL SISTEMA DE CESIONES DE MARCAS Y PATENTES. EN CASO DE QUE
ENCUENTREN ALGÚN ERROR O TENGAN PREGUNTAS RELACIONADAS CON ESTE AVISO,
PODRÁN PONERSE EN CONTACTO CON EL EMPLEADO CUYO NOMBRE APARECE EN
ESTE AVISO EN EL TEL 571-272-3350. CUALQUIER SOLICITUD DE CORRECCIÓN DIRIGIRLA
A: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT SERVICES DIVISION,
P.O. BOX 1450, ALEXANDRIA, VA 22313.

FECHA DE REGISTRO: 05/13/2005

CARRETEL/MARCO: 016557/0372
NO DE PÁGINAS: 7

RESUMEN: CESIÓN DE LOS INTERESES DEL CEDENTE (VER DOCUMENTO)

CEDENTE:

HARTGROVE, HERBERT

FECHA DOC: 04/18/2005

★ María Mercedes Uricoechea T.
Traductora Juramentada
Resolución 10607/81 Minjusticia

Traducción Oficial No. 10.436

CEDENTE:
TINDALL, RUSSELL

FECHA DOC: 04/18/2005

CEDENTE:
CARTER, NICK M.

FECHA DOC: 04/18/2005

CEDENTE:
MCNAULL, CYNTHIA DAWSON

FECHA DOC: 04/18/2005

CESIONARIO:
POLYMER GROUP, INC
4055 FABER PLACE DRIVE SUITE 201
NORTH CHARLESTON, SOUTH CAROLINA
29405

NO. DE SERIE: 11050283
NO. DE PATENTE:

FECHA RADICACIÓN: 02/03/2005
FECHA DE EXPEDICIÓN

TÍTULO: REFUERZO SECUNDARIO NO TEJIDO ANTIACÚSTICO PARA ALFOMBRAS

(SOUND ABSORBING SECONDARY NONWOVEN CARPET BACKING)
TELA CELULÓSICA NO TEJIDA DE COMBUSTIÓN LENTA

VIOLET MCCOY, EXAMINADOR
DIVISIÓN DE TRASPASOS
OFICINA DE REGISTROS PÚBLICOS

 **María Mercedes Uricoechea T.**
Traductora Juramentada
Resolución 10607/S1 Minjusstia 2

FORMULARIO DE REGISTRO
05-17-2005
103004576

PARA: Mail Stop Assignments, Director de la Oficina de Marcas y Patentes de EE.UU. P.O. Box 1450, Alexandria, VA 22313-1450 Sírvase registrar los documentos originales adjuntos o copia de los mismos											
1. Nombre de/los cedente(s): <table border="0"><thead><tr><th></th><th><u>Fecha</u></th></tr></thead><tbody><tr><td>Hartgrove, Herbert</td><td>18 abril, 2005</td></tr><tr><td>Tindall, Russell</td><td>18 abril, 2005</td></tr><tr><td>Carter, Nick M.</td><td>18 abril, 2005</td></tr><tr><td>McNaull, Cynthia Dawson</td><td>18 abril, 2005</td></tr></tbody></table> ¿Se adjunta(n) otro(s) nombre(s)? ☒ No		<u>Fecha</u>	Hartgrove, Herbert	18 abril, 2005	Tindall, Russell	18 abril, 2005	Carter, Nick M.	18 abril, 2005	McNaull, Cynthia Dawson	18 abril, 2005	2. Nombre y dirección de la(s) parte(s) receptora(s) Nombre: <u>Polymer Group, Inc.</u> Dirección: <u>4055 Faber Place Drive</u> Suite 201 Ciudad: <u>North Charleston</u> Estado: <u>South Carolina</u> Zip: <u>29405</u> ¿Se adjuntan nombres adicionales? ☒ No
	<u>Fecha</u>										
Hartgrove, Herbert	18 abril, 2005										
Tindall, Russell	18 abril, 2005										
Carter, Nick M.	18 abril, 2005										
McNaull, Cynthia Dawson	18 abril, 2005										
3. Naturaleza del traspaso: ☒ Cesión											
4. No(s) de la solicitud o No(s) de la(s) patente(s): No. Solicitud de Patente <u>11/050,283</u> ¿Se adjunta(n) más número(s)? ☒ No											
5. Nombre y dirección a quien se le debe enviar la correspondencia referente al documento: Wood, Philips, Katz, Clark & Mortimer Citicorp Center, Suite 3800 500 West Madison Street Chicago, Ill, 60661-2511 Tel: (312) 876-1800	6. Número de Solicitudes y patentes: 1 7. Total comisión (37 CFR 3.41): 40.00 ☒ Adjunta. 8. Número de cuenta de depósito: <u>23-0785</u>										
NO UTILICE ESTE ESPACIO											
9. Declaración y firma <table border="0"><tr><td>Stephen D. Geimer, 28,846</td><td>(Firma)</td><td>Fecha: 11 de mayo de 2005</td></tr></table> Número total de páginas incluida esta portada: 7		Stephen D. Geimer, 28,846	(Firma)	Fecha: 11 de mayo de 2005							
Stephen D. Geimer, 28,846	(Firma)	Fecha: 11 de mayo de 2005									

 **María Mercedes Uricoechea T.**
Traductora Juramentada
Resolución 10607/81 Minjusticia

Traspas

Serie No. 11/050,283

Radicado el 3 de febrero de 2005

Por el pago de Un Dólar y otro pago bueno y oneroso, cuyo recibo se adjunta por el presente, todos los derechos, títulos e intereses en la invención o mejoras de los suscritos en la invención **REFUERZO SECUNDARIO NO TEJIDO ANTIACÚSTICO PARA ALFOMBRAS** [*Sound Absorbing Secondary Nonwoven Carpet Backing*] y en la solicitud de Certificación de Patente de los Estados Unidos para la misma, hechas por los suscritos al mismo tiempo de este traspaso, y en cualquier re-emisión o extensión de Certificaciones de Patente que se puedan otorgar en dicha solicitud son traspasados por los suscritos a **Polymer Group, Inc.**, una sociedad de Delaware, con oficinas situadas en **4055 Faber Place Drive, Suite 201, North Charleston, South Carolina 29405**, y a los sucesores, representantes legales cesionarios de **Polymer Group Inc.**, (referidos colectivamente como la Cesionaria) y el Comisionado de Marcas y Patentes queda autorizado y los suscritos le solicitan expedir dichas Certificaciones de Patente a dicha Cesionaria.

Por dicha consideración, los suscritos acuerdan por el presente, a solicitud de dicha Cesionaria, hacer los juramentos o declaraciones necesarios e indicados relacionados con dicha solicitud o requeridos para la presentar o adelantar cualquier solicitud divisional o de continuación, o para presentar o adelantar cualquier solicitud para la re-expedición o extensión de cualquier Certificación de Patente que pueda otorgarse sobre dicha invención y mejoras que dicha Cesionaria considere necesarias o convenientes, y por dicha consideración los suscritos acuerdan además, a solicitud de dicha Cesionaria, en caso de dicha solicitud o cualquier división de la misma, o Certificaciones de Patente que se expidan sobre la misma, o cualquier re-expedición o solicitud para la re-expedición de la misma, que implique Interferencia, cooperar hasta la mejor de las capacidades de los suscritos con dicha Cesionaria en los asuntos relacionados con la elaboración y celebración de la declaración preliminar y entregar y producir evidencia que respalde los mismos, y además hacer, a dicha solicitud, todos los actos afirmativos con el fin de obtener dichas Certificaciones de Patente e invertir todos los derechos que se traspasan por medio de este documento a dicha Cesionaria, tan plena y totalmente como si los suscritos hubieran gozado de los mismos si este traspaso y venta no se hubiera hecho. Y por dicha consideración, todo el derecho, título e interés en dicha invención o mejoras, incluidos todos los derechos de prioridad, y el derecho a reclamar derechos de prioridad y los privilegios y beneficios de los mismos, incluidos aquellos bajo la Convención Internacional, y otras Convenciones, y el derecho a radicar solicitudes de patente en nombre de dicha Cesionaria para dicha invención o mejoras en todos los países del mundo, por el presente quedan cedidos y conferidos a dicha Cesionaria por parte del suscrito. Los suscritos acuerdan además, a solicitud de dicha

María Mercedes Uricoechea T.

Traductora Juramentada

Resolución 10607/81 Minjusticia

4

Cesionario, suscribir todos los documentos que el suscrito deba hacer en relación con todas las solicitudes de Certificaciones de Patente extranjeras para lo mismo, incluido proseguir y suscribir todos los documentos necesarios para conferir en dicha Cesionario el título en dichas solicitudes y patentes extranjeras. Los suscritos acuerdan además, por dicha consideración, a solicitud de la Cesionario, hacer prontamente todos los actos lícitos que dicha Cesionario considere necesarios o aconsejables en relación con el mantenimiento, mérito ejecutorio o traspaso de las concesiones resultantes de dichas Certificaciones de Patente en los Estados Unidos o en otros países. Se acuerda que dichos actos lícitos incluyen, mas no se limitan a tomar juramentos, rendir declaraciones, otorgar poderes, cesiones y otros documentos y dar testimonio.

Los abogados registrados en dicha solicitud de patente quedan autorizados y el solicitante les solicita incluir en este Traspaso la fecha y el número de serie en los espacios que se proveen para tal fin.

Firma Herbert Hartgrove

Suscrito hoy 18 de abril de 2005

Estado de NC

Condado de Johnston - Juramentado y suscrito

El 18 de abril de 2005, Herbert Hartgrove compareció ante mí, una Notaria Pública en y para el Estado y Condado arriba mencionados, y reconoció que él mismo firmó y ejecutó el documento de Traspaso adjunto de manera libre y voluntaria para los fines y usos que se expresan allí.

Firma: Mary W. Walker
Mi comisión vence el 9-17-05

(Firma) Russell Tindall

Suscrito hoy 18 de abril de 2005.

Estado de NC

Condado de Johnston - Juramentado y suscrito

El 18 de abril de 2005, Russell Tindall compareció ante mí, una Notaria Pública en y para el Estado y Condado arriba mencionados, y reconoció que él mismo firmó y ejecutó el documento de Traspaso adjunto de manera libre y voluntaria para los fines y usos que se expresan allí.

Firma: Mary W. Walker
Mi comisión vence el 9 -17-05

 **María Mercedes Uricoechea T.**
Traductora Juramentada
Resolución 10607/81 Minjusticia

(Firma) Cynthia D. McNaull

Suscrito hoy 29 de abril de 2005.

Estado de NC

Condado de Johnston - Juramentado y suscrito

El 18 de abril de 2005, Russell Tindall compareció ante mí, una Notaria Pública en y para el Estado y Condado arriba mencionados, y reconoció que él mismo firmó y ejecutó el documento de Traspaso adjunto de manera libre y voluntaria para los fines y usos que se expresan allí.

Firma: Mary W. Walker

Mi comisión vence el 9 -17-05

Por el presente certifico que la copia adjunta es una copia fiel de los documentos de Traspaso entregados a la Oficina de Marcas y patentes de los Estados Unidos.

(FIRMA) Stephen D. Geimer

Suscrito hoy, 22 de agosto de 2006

LEGALIZACIONES

55384

Estado de Maryland, Condado de Anne Arundel:

Yo, Robert P. Duckworth, Secretario de la Corte de Circuito del Condado de Anne Arundel, Maryland, una Corte de Registro, certifico que: **AHMAD MISKI** fue comisionado/nombrado y calificado como Notario Público para una vigencia que comenzó el 5 de mayo de 2005.

En Testimonio de lo cual, firmo y estampo el sello de esta Corte, hoy 7 de agosto de 2006.

FIRMA: Robert P. Duckworth, Secretario – (SELLO IMPRESO)

Secretario de la Corte de Circuito del Condado de Anne Arundel, Maryland

 **Maria Mercedes Uricoechea T.**
Traductora Juramentada
Resolución 10607/81 Minjusticia

LEGALIZACIONES

El Estado de Maryland

Oficina del Secretario de Estado

APOSTILLE

(Convention de La Haye du 5 octobre 1961)

1. País: Estados Unidos de América

Este documento público

2. fue suscrito por Robert P. Duckworth

3. quien actúa en capacidad de: **Secretario de la Corte de Circuito del Condado de Anne Arundel**

4. lleva el sello de **La Corte de Circuito del Condado de Anne Arundel**

Certificado

4. en Anápolis, Maryland.

6. hoy 24 de agosto de 2006

7. por el Secretario de Estado de Maryland

8. No. **182626**

9. Sello DE OBLEA

10. Firma
(Ilegible)
Secretario de Estado

LA ANTERIOR ES UNA TRADUCCIÓN FIEL Y COMPLETA DE LA CUAL SE DEJA COPIA EN LOS ARCHIVOS
DE LA CALLE 84 NO. 18-38 (OF. 201) PARA SU CONFRONTACIÓN. TEL. 218 1007 - 623 3301

MARIA MERCEDES URICOECHEA T.
C.C. 41.319.274 BOGOTA
TRADUCTORA/INTÉRPRETE OFICIAL
RES. 10607 DEL 31 DE DICIEMBRE/81, MINJUSTICIA

FIN DE LA TRADUCCION OFICIAL NO. 10.436


Maria Mercedes Uricoechea T.
Traductora Juramentada
Resolución 10607/81 Minjusticia



The State of Maryland

Office of the Secretary of State

Apostille

(Convention de La Haye du 5 Octobre 1961)

1. Country: United States of America
This public document
2. has been signed by Robert P. Duckworth
3. acting in the capacity of Clerk of the Circuit Court for Anne Arundel County
4. bears the seal/stamp of the Circuit Court for Anne Arundel County

Certified

5. at Annapolis, Maryland
6. the 24th day of August, 2006
7. by The Secretary of State of Maryland
8. Seal



9. Signature

A handwritten signature in cursive script, likely belonging to the Secretary of State.

Secretary of State

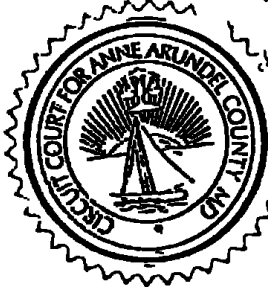
No. 182626

55384

State of Maryland, Anne Arundel County, Md.

I, ROBERT P DUCKWORTH, Clerk of the Circuit Court for Anne Arundel County, Maryland, a court of record, do hereby certify that Ahmad Miski was a commissioned/appointed and qualified Notary Public commencing on the 5th day of May, 2005

In Testimony Whereof, I have hereunto set my hand and affixed the seal of the court this 24th day of August, 2006



Robert P. Duckworth
Robert P. Duckworth, Clerk
Circuit Court for Anne Arundel County, Maryland

I hereby certify the attached to be a true copy of the Assignment documents forwarded to the United States Patent and Trademark Office.

Stephen D. Geimer
Stephen D. Geimer

Executed this 22nd day of August, 2006.

State of Illinois)
County of Cook) ss.

On August 22, 2006, Stephen D. Geimer, appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

Karen A. Sanderson
Notary Public

My Commission Expires: April 5, 2009

(SEAL)



My Commission Expires
03/01/2009

AUG 24 2006

[Handwritten signature]



UNITED STATES PATENT AND TRADEMARK OFFICE

PGT 6044 P3021US

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

SEPTEMBER 20, 2005

PTAS
WOOD, PHILLIPS, KATZ CLARK & MORTIMER
CITICORP CENTER, SUITE 3800
500 WEST MADISON STREET
CHICAGO, ILLINOIS 60661-2511



WOOD, PHILLIPS

UNITED STATES PATENT AND TRADEMARK OFFICE
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 571-272-3350. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT SERVICES DIVISION, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 05/13/2005

REEL/FRAME: 016557/0372
NUMBER OF PAGES: 7

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:

HARTGROVE, HERBERT P.

DOC DATE: 04/18/2005

ASSIGNOR:

TINDALL, RUSSELL

DOC DATE: 04/18/2005

ASSIGNOR:

CARTER, NICK M.

DOC DATE: 04/18/2005

ASSIGNOR:

MCNAULL, CYNTHIA DAWSON

DOC DATE: 04/29/2005

ASSIGNEE:

POLYMER GROUP, INC.
4055 FABER PLACE DRIVE, SUITE 201
NORTH CHARLESTON, SOUTH CAROLINA

29405

016557/0372 PAGE 2

SERIAL NUMBER: 11050283

FILING DATE: 02/03/2005

PATENT NUMBER:

ISSUE DATE:

TITLE: SOUND ABSORBING SECONDARY NONWOVEN CARPET BACKING

VIOLET MCCOY, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

05-17-2005

Comparable to Form PTO-1995
(Rev. 10/02)
JMR0651-0027 (exp. 6/30/2005)

RECORD



103004576

U.S. Department of Commerce
Patent and Trademark Office

5/13/05

TO: Mail Stop Assignments, Director, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450
Please record the attached original document(s) or copy(ies).

1. Name of conveying party(ies) and execution date:		2. Name and address of receiving party(ies):	
Execution Date Harigrove, Herbert P. 18 April 2005 Tindall, Russell 18 April 2005 Carter, Nick M. 18 April 2005 McNaull, Cynthia Dawson 29 April 2005		Name: <u>Polymer Group, Inc.</u> Street Address: <u>4055 Faber Place Drive</u> <u>Suite 201</u> City: <u>North Charleston</u> State: <u>South Carolina</u> Zip: <u>29405</u>	
Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No		Additional name(s) address(es) attached? ☐ Yes ☒ No	
3. Nature of conveyance: ☒ Assignment ☐ Merger ☐ Security Agreement ☐ Change of Name ☐ Other: _____		OFFICE OF THE 2005 MAY 13 11 41 AM FINANCE SECTION	
4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application is: A. Patent Application Number(s): <u>11/050,283</u> B. Patent Number(s): _____ Additional numbers attached: ☐ Yes ☒ No			
5. Name and address of party to whom correspondence concerning document should be mailed: Wood, Phillips, Katz, Clark & Mortimer Citicorp Center, Suite 3800 500 West Madison Street Chicago, Illinois 60661-2511 Phone: (312) 876-1800		6. Total number of applications and patents involved: <u>1</u> 7. Total Fee (37 CFR 3.41) <u>\$40.00</u> ☒ Enclosed ☐ Authorized to charge Deposit Account 8. Deposit Account No.: <u>23-0785</u>	
DO NOT USE THIS SPACE			
9. SIGNATURE Stephen D. Geisler, 28,846 Name of Person Signing Signature May 11, 2005 Date			
Total number of pages including cover sheet, attachment, and documents: <u>seven (7)</u>			

5/16/2005 870H11 00000047 11050283

1 FD:8021

40.00 BP

Assignment

Serial No : 11/050,283

Filed: February 3, 2005

In Consideration of One Dollar and other good and valuable considerations, the receipt of which is hereby acknowledged, the entire right, title and interest in the invention or improvements of the undersigned in Sound Absorbing Secondary Nonwoven Carpet Backing and in the application for Letters Patent of the United States therefor, executed by the undersigned concurrently herewith, and in any reissue or extension of any Letters Patent that may be granted upon said application are hereby assigned by the undersigned to Polymer Group, Inc., a Delaware corporation, having offices at 4055 Faber Place Drive, Suite 201, North Charleston, South Carolina 29405 and the successors, legal representatives and assigns of Polymer Group, Inc., (hereinafter collectively called said Assignee), and the Commissioner of Patents and Trademarks is hereby authorized and requested by the undersigned to issue said Letters Patent to said Assignee.

For said considerations it is hereby agreed by the undersigned, upon the request of said Assignee, to execute any necessary and proper oaths or affidavits relating to said application or required for the filing or prosecution of any divisional or continuing application thereof or for the filing or prosecution of any application for the reissue or extension of any Letters Patent that may be granted on said invention or improvements that said Assignee may deem necessary or expedient, and for the said considerations it is further agreed by the undersigned, upon the request of said Assignee, in the event of said application or any division thereof, or Letters Patent issued thereon, or any reissue or application for the reissue thereof, becoming involved in interference, to cooperate to the best of the ability of the undersigned with said Assignee in the matters of preparing and executing the preliminary statement and giving and producing evidence in support thereof, and further to perform, upon such request, any and all affirmative acts to obtain said Letters Patent and vest all rights therein hereby conveyed in the said Assignee as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment and sale had not been made. And for the said considerations the entire right, title and interest in said invention or improvements, including all priority rights, and the right to claim priority rights and the privileges and benefits thereof, including those under the International Convention, and all other Conventions, and the right to file applications for patent in said Assignee's own name for said invention or improvements in each and every country of the world are hereby assigned and granted by the undersigned to said Assignee. It is further agreed by the undersigned, upon the request of said Assignee, to execute any and all documents that shall be required of the undersigned to be executed in connection with any and all applications for foreign Letters Patent therefor, including the prosecution thereof, and to execute any and all documents necessary to invest title in said foreign applications and patents in said Assignee. The undersigned also further agrees, for the said considerations, upon the request of said Assignee, to promptly perform all lawful acts deemed by said Assignee to be necessary or advisable in connection with maintaining, enforcing, or transferring the resulting grants of said Letters Patent in the United States or foreign countries. It is agreed that such lawful acts include, but are not limited to, taking oaths, executing declarations, powers, assignments and other papers and giving testimony. The attorneys of record in such

Serial No.: 11/050,283

Filed: February 3, 2005

application for patent are hereby authorized and requested by the undersigned to insert in this Assignment the date and serial number thereof in the places provided therefor.

Herbert Hartgrove
Herbert P. Hartgrove

Executed this 18 day of April, 2005.

State of NC.)
County of Yorkston) ss.

On April 18, 2005, Herbert P. Hartgrove appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Mary W. Walker
Notary Public

My Commission Expires: 9-17-05

.....

Russell Tindall

Executed this ____ day of _____, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Russell Tindall appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

.....

Assignment

Serial No.: 11/050,283

Filed: February 3, 2005

In Consideration of One Dollar and other good and valuable considerations, the receipt of which is hereby acknowledged, the entire right, title and interest in the invention or improvements of the undersigned in Sound Absorbing Secondary Nonwoven Carpet Backing and in the application for Letters Patent of the United States therefor, executed by the undersigned concurrently herewith, and in any reissue or extension of any Letters Patent that may be granted upon said application are hereby assigned by the undersigned to Polymer Group, Inc., a Delaware corporation, having offices at 4055 Faber Place Drive, Suite 201, North Charleston, South Carolina 29405 and the successors, legal representatives and assigns of Polymer Group, Inc., (hereinafter collectively called said Assignee), and the Commissioner of Patents and Trademarks is hereby authorized and requested by the undersigned to issue said Letters Patent to said Assignee.

For said considerations it is hereby agreed by the undersigned, upon the request of said Assignee, to execute any necessary and proper oaths or affidavits relating to said application or required for the filing or prosecution of any divisional or continuing application thereof or for the filing or prosecution of any application for the reissue or extension of any Letters Patent that may be granted on said invention or improvements that said Assignee may deem necessary or expedient, and for the said considerations it is further agreed by the undersigned, upon the request of said Assignee, in the event of said application or any division thereof, or Letters Patent issued thereon, or any reissue or application for the reissue thereof, becoming involved in interference, to cooperate to the best of the ability of the undersigned with said Assignee in the matters of preparing and executing the preliminary statement and giving and producing evidence in support thereof, and further to perform, upon such request, any and all affirmative acts to obtain said Letters Patent and vest all rights therein hereby conveyed in the said Assignee as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment and sale had not been made. And for the said considerations the entire right, title and interest in said invention or improvements, including all priority rights, and the right to claim priority rights and the privileges and benefits thereof, including those under the International Convention, and all other Conventions, and the right to file applications for patent in said Assignee's own name for said invention or improvements in each and every country of the world are hereby assigned and granted by the undersigned to said Assignee. It is further agreed by the undersigned, upon the request of said Assignee, to execute any and all documents that shall be required of the undersigned to be executed in connection with any and all applications for foreign Letters Patent therefor, including the prosecution thereof, and to execute any and all documents necessary to invest title in said foreign applications and patents in said Assignee. The undersigned also further agrees, for the said considerations, upon the request of said Assignee, to promptly perform all lawful acts deemed by said Assignee to be necessary or advisable in connection with maintaining, enforcing, or transferring the resulting grants of said Letters Patent in the United States or foreign countries. It is agreed that such lawful acts include, but are not limited to, taking oaths, executing declarations, powers, assignments and other papers and giving testimony. The attorneys of record in such

Serial No.: 11/050,283

Filed: February 3, 2005

application for patent are hereby authorized and requested by the undersigned to insert in this Assignment the date and serial number thereof in the places provided therefor.

Herbert P. Hartgrove

Executed this _____ day of _____, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Herbert P. Hartgrove appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

.....
Russell Tindall
Russell Tindall

Executed this 18th day of April, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Russell Tindall appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

.....

Serial No.: 11/050,283

Filed: February 3, 2005

Nick M. Carter

Executed this _____ day of _____, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Nick M. Carter appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

Cynthia D. McNaull
Cynthia Dawson McNaull

Executed this 29 day of April, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Cynthia Dawson McNaull appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

Compatible to Form PTO-1595
(Rev. 1C02)
J5180651-0027 (exp. 6/30/2005)

RECORDATION FORM COVER SHEET
PATENTS ONLY

U.S. Department of Commerce
Patent and Trademark Office

TO: Mail Stop Assignments, Director, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 Please record the attached original document(s) or copy(ies).	
1. Name of conveying party(ies) and execution date: Hartgrove, Herbert P. <u>Execution Date</u> Tindall, Russell 18 April 2005 Carter, Nick M. 18 April 2005 McNaul, Cynthia Dawson 29 April 2005 Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No	2. Name and address of receiving party(ies): Name: <u>Polymer Group, Inc.</u> Street Address: <u>4055 Faber Place Drive</u> <u>Suite 201</u> City: <u>North Charleston</u> State: <u>South Carolina</u> Zip: <u>29405</u> Additional name(s) address(es) attached? ☐ Yes ☒ No
3. Nature of conveyance: ☒ Assignment ☐ Merger ☐ Security Agreement ☐ Change of Name ☐ Other: _____	OFFICE OF PUBLIC INFORMATION 705 MAY 13 PM 01 FINANCE SECTION
4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application is: A. Patent Application Number(s): <u>11/050,253</u> B. Patent Number(s): _____ Additional numbers attached: ☐ Yes ☒ No	
5. Name and address of party to whom correspondence concerning document should be mailed: Wood, Phillips, Katz, Clark & Mortimer Citicorp Center, Suite 3800 500 West Madison Street Chicago, Illinois 60661-2511 Phone: (312) 876-1800	6. Total number of applications and patents involved: <u>1</u> 7. Total Fee (37 CFR 3.41) <u>\$40.00</u> ☒ Enclosed ☐ Authorized to charge Deposit Account 8. Deposit Account No.: <u>23-0785</u>
DO NOT USE THIS SPACE	
9. SIGNATURE <u>Stephen D. Geimer, 28,846</u> <u>[Signature]</u> <u>May 11, 2005</u> Name of Person Signing Signature Date	
Total number of pages including cover sheet, attachment, and documents: <u>seven (7)</u>	



The State of Maryland

Office of the Secretary of State

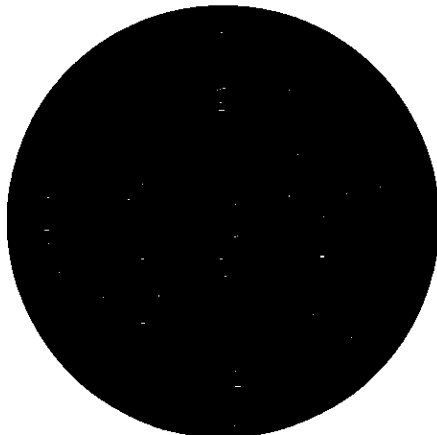
Apostille

(Convention de La Haye du 5 Octobre 1961)

1. Country: United States of America
This public document
2. has been signed by Robert P. Duckworth
3. acting in the capacity of Clerk of the Circuit Court for Anne Arundel County
4. bears the seal/stamp of the Circuit Court for Anne Arundel County

Certified

5. at Annapolis, Maryland
6. the 24th day of August, 2006
7. by The Secretary of State of Maryland
8. Seal



9. Signature

A handwritten signature in cursive script, appearing to read "Mary P. Hens".

Secretary of State

No. 182626

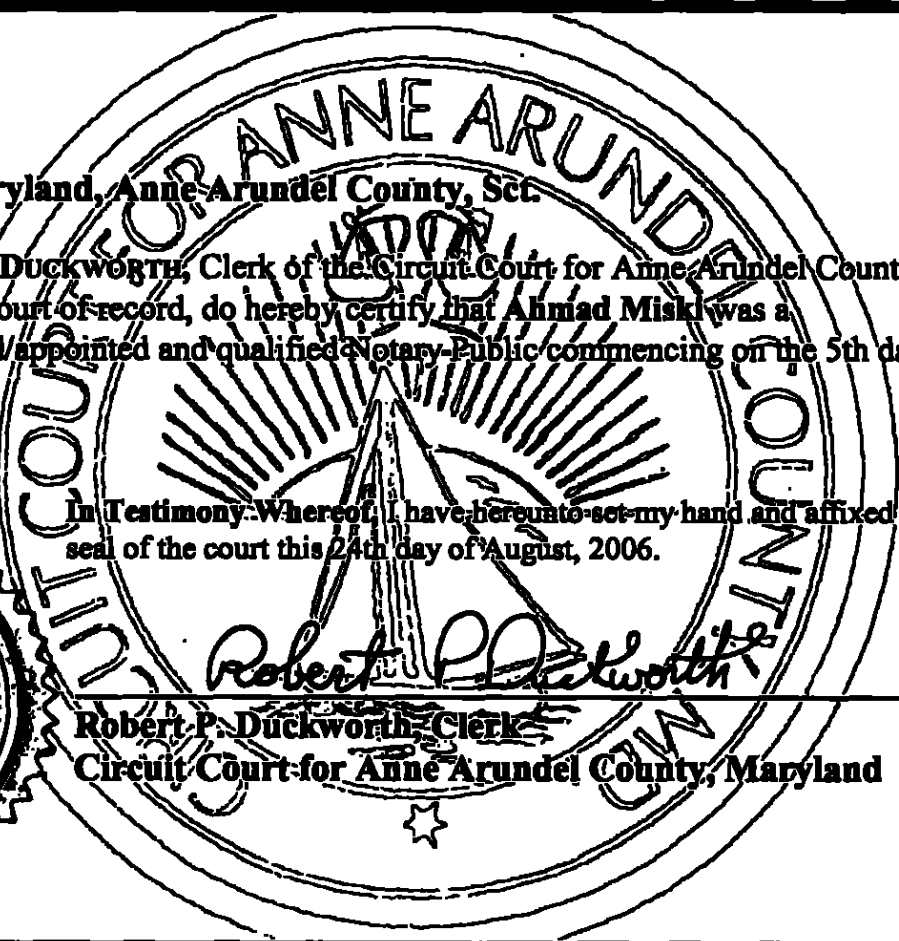
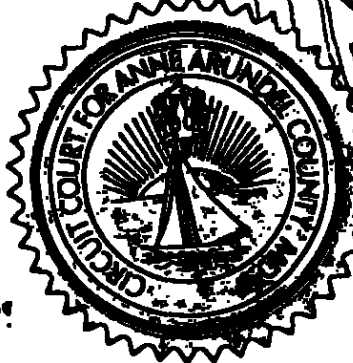
State of Maryland, Anne Arundel County, Sect.

I, ROBERT P. DUCKWORTH, Clerk of the Circuit Court for Anne Arundel County, Maryland, a court of record, do hereby certify that Ahmad Miski was a commissioned/appointed and qualified Notary Public commencing on the 5th day of May, 2005.

In Testimony Whereof, I have hereunto set my hand and affixed the seal of the court this 24th day of August, 2006.

Robert P. Duckworth

Robert P. Duckworth, Clerk
Circuit Court for Anne Arundel County, Maryland



62

I hereby certify the attached to be a true copy of the Assignment documents forwarded to the United States Patent and Trademark Office.

Stephen D. Geimer
Stephen D. Geimer

Executed this 22nd day of August, 2006.

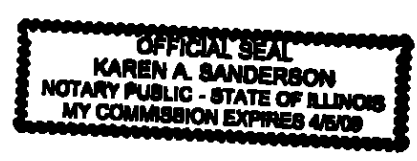
State of Illinois)
County of Cook) ss.

On August 22, 2006, Stephen D. Geimer, appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

Karen A. Sanderson
Notary Public

My Commission Expires: April 5, 2009

(SEAL)



My Commission Expires
05/01/2009

AUG 24 2006

1-1



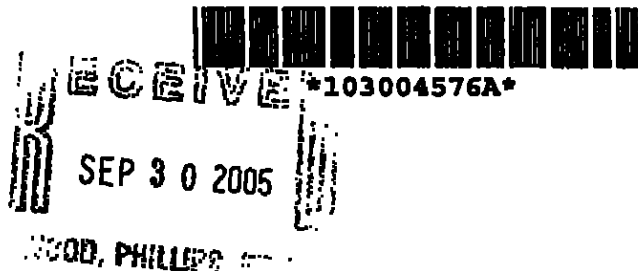
67

UNITED STATES PATENT AND TRADEMARK OFFICE

PGI 6044 P3021US

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

SEPTEMBER 20, 2005

PTAS
WOOD, PHILLIPS, KATZ CLARK & MORTIMER
CITICORP CENTER, SUITE 3800
500 WEST MADISON STREET
CHICAGO, ILLINOIS 60661-2511UNITED STATES PATENT AND TRADEMARK OFFICE
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RECORDATION DATE: 05/13/2005

REEL/FRAME: 016557/0372
NUMBER OF PAGES: 7

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:

HARTGROVE, HERBERT P.

DOC DATE: 04/18/2005

ASSIGNOR:

TINDALL, RUSSELL

DOC DATE: 04/18/2005

ASSIGNOR:

CARTER, NICK M.

DOC DATE: 04/18/2005

ASSIGNOR:

MCNAUL, CYNTHIA DAWSON

DOC DATE: 04/29/2005

ASSIGNEE:

POLYMER GROUP, INC.
4055 FABER PLACE DRIVE. SUITE 201
NORTH CHARLESTON, SOUTH CAROLINA

29405

016557/0372 PAGE 2

SERIAL NUMBER: 11050283

FILING DATE: 02/03/2005

PATENT NUMBER:

ISSUE DATE:

TITLE: SOUND ABSORBING SECONDARY NONWOVEN CARPET BACKING

VIOLET MCCOY, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

65
05-17-2005

Comparable to Form PTO-1595

RECORDA

U.S. Department of Commerce
Patent and Trademark Office

(Rev. 10/02)

MB0651-0027 (exp. 6/30/2005)

103004576

5/13/05

TO: Mail Stop Assignments, Director, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450
Please record the attached original document(s) or copy(ies).

1. Name of conveying party(ies) and execution date:		2. Name and address of receiving party(ies):	
Execution Date Hartgrove, Herbert P. 18 April 2005 Tindall, Russell 18 April 2005 Carter, Nick M. 18 April 2005 McNaull, Cynthia Dawson 29 April 2005		Name: <u>Polymer Group, Inc.</u> Street Address: <u>4055 Faber Place Drive</u> <u>Suite 201</u> City: <u>North Charleston</u> State: <u>South Carolina</u> Zip: <u>29405</u>	
Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No		Additional name(s) address(es) attached? ☐ Yes ☒ No	
3. Nature of conveyance: ☒ Assignment ☐ Merger ☐ Security Agreement ☐ Change of Name ☐ Other: _____		OFFICE OF PUBLIC RELATIONS 205 MAY 13 PM 4:11 FINANCE SECTION	
4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application is: _____			
A. Patent Application Number(s): 11/050,283		B. Patent Number(s): _____	
Additional numbers attached: ☐ Yes ☒ No			
5. Name and address of party to whom correspondence concerning document should be mailed: Wood, Phillips, Katz, Clark & Mortimer Citicorp Center, Suite 3800 500 West Madison Street Chicago, Illinois 60661-2511 Phone: (312) 876-1800		6. Total number of applications and patents involved: <u>1</u>	
		7. Total Fee (37 CFR 3.41) \$40.00 ☒ Enclosed ☐ Authorized to charge Deposit Account	
		8. Deposit Account No.: 23-0785	
DO NOT USE THIS SPACE			
9. SIGNATURE			
Stephen D. Geimer, 28,846 Name of Person Signing		 Signature	
		May 11, 2005 Date	
Total number of pages including cover sheet, attachment, and documents: <u>seven (7)</u>			

5/16/2005 870H11 00000047 11050283

1 FC:8021

40.00 BP

Assignment

Serial No.: 11/050,283

Filed: February 3, 2005

In Consideration of One Dollar and other good and valuable considerations, the receipt of which is hereby acknowledged, the entire right, title and interest in the invention or improvements of the undersigned in Sound Absorbing Secondary Nonwoven Carpet Backing and in the application for Letters Patent of the United States therefor, executed by the undersigned concurrently herewith, and in any reissue or extension of any Letters Patent that may be granted upon said application are hereby assigned by the undersigned to Polymer Group, Inc., a Delaware corporation, having offices at 4055 Faber Place Drive, Suite 201, North Charleston, South Carolina 29405 and the successors, legal representatives and assigns of Polymer Group, Inc., (hereinafter collectively called said Assignee), and the Commissioner of Patents and Trademarks is hereby authorized and requested by the undersigned to issue said Letters Patent to said Assignee.

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69
67

Serial No.: 11/050,283

Filed: February 3, 2005

application for patent are hereby authorized and requested by the undersigned to insert in this Assignment the date and serial number thereof in the places provided therefor.

Herbert Hartgrove
Herbert P. Hartgrove

Executed this 18 day of April, 2005.

State of NC.
County of Johnston) ss.

On April 18, 2005, Herbert P. Hartgrove appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Mary W. Walker
Notary Public

My Commission Expires: 9-17-05

Russell Tindall

Executed this ____ day of ____, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Russell Tindall appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

69

Serial No.: 11/050,283

Filed: February 3, 2005

Nick M. Carter
Nick M. Carter

Executed this 10th day of April, 2005.

State of Kansas)
County of Kingman) ss.

On April 18, 2005, Nick M. Carter appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Karen R. Bales
Notary Public

My Commission Expires: 1-19-08

KAREN R. BALES
NOTARY PUBLIC
STATE OF KANSAS
My Appt. Exp. 1-19-08

Cynthia Dawson McNaull
Cynthia Dawson McNaull

Executed this ____ day of _____, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Cynthia Dawson McNaull appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

Assignment

Serial No.: 11/050,283

Filed: February 3, 2005

In Consideration of One Dollar and other good and valuable considerations, the receipt of which is hereby acknowledged, the entire right, title and interest in the invention or improvements of the undersigned in Sound Absorbing Secondary Nonwoven Carpet Backing and in the application for Letters Patent of the United States therefor, executed by the undersigned concurrently herewith, and in any reissue or extension of any Letters Patent that may be granted upon said application are hereby assigned by the undersigned to Polymer Group, Inc., a Delaware corporation, having offices at 4055 Faber Place Drive, Suite 201, North Charleston, South Carolina 29405 and the successors, legal representatives and assigns of Polymer Group, Inc., (hereinafter collectively called said Assignee), and the Commissioner of Patents and Trademarks is hereby authorized and requested by the undersigned to issue said Letters Patent to said Assignee.

For said considerations it is hereby agreed by the undersigned, upon the request of said Assignee, to execute any necessary and proper oaths or affidavits relating to said application or required for the filing or prosecution of any divisional or continuing application thereof or for the filing or prosecution of any application for the reissue or extension of any Letters Patent that may be granted on said invention or improvements that said Assignee may deem necessary or expedient, and for the said considerations it is further agreed by the undersigned, upon the request of said Assignee, in the event of said application or any division thereof, or Letters Patent issued thereon, or any reissue or application for the reissue thereof, becoming involved in interference, to cooperate to the best of the ability of the undersigned with said Assignee in the matters of preparing and executing the preliminary statement and giving and producing evidence in support thereof, and further to perform, upon such request, any and all affirmative acts to obtain said Letters Patent and vest all rights therein hereby conveyed in the said Assignee as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment and sale had not been made. And for the said considerations the entire right, title and interest in said invention or improvements, including all priority rights, and the right to claim priority rights and the privileges and benefits thereof, including those under the International Convention, and all other Conventions, and the right to file applications for patent in said Assignee's own name for said invention or improvements in each and every country of the world are hereby assigned and granted by the undersigned to said Assignee. It is further agreed by the undersigned, upon the request of said Assignee, to execute any and all documents that shall be required of the undersigned to be executed in connection with any and all applications for foreign Letters Patent therefor, including the prosecution thereof, and to execute any and all documents necessary to invest title in said foreign applications and patents in said Assignee. The undersigned also further agrees, for the said considerations, upon the request of said Assignee, to promptly perform all lawful acts deemed by said Assignee to be necessary or advisable in connection with maintaining, enforcing, or transferring the resulting grants of said Letters Patent in the United States or foreign countries. It is agreed that such lawful acts include, but are not limited to, taking oaths, executing declarations, powers, assignments and other papers and giving testimony. The attorneys of record in such

Serial No.: 11/050,283

Filed: February 3, 2005

application for patent are hereby authorized and requested by the undersigned to insert in this Assignment the date and serial number thereof in the places provided therefor.

Herbert P. Hartgrove

Executed this _____ day of _____, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Herbert P. Hartgrove appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

Russell Tindall

Russell Tindall

Executed this 18th day of April, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Russell Tindall appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

Serial No.: 11/050,283

Filed: February 3, 2005

Nick M. Carter

Executed this ____ day of _____, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Nick M. Carter appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

Cynthia D. McNaull

Cynthia Dawson McNaull

Executed this 29 day of April, 2005.

State of _____)
County of _____) ss.

On _____, 2005, Cynthia Dawson McNaull appeared before me, a Notary Public, in and for the State and County aforesaid, and acknowledged that he/she freely and voluntarily subscribed and executed the foregoing Assignment for the purposes and uses therein expressed.

(SEAL)

Notary Public

My Commission Expires: _____

RECORDATION FORM COVER SHEET
PATENTS ONLY

U.S. Department of Commerce
Patent and Trademark Office

72

TO: Mail Stop Assignments, Director, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450
Please record the attached original document(s) or copy(ies).

1. Name of conveying party(ies) and execution date:

	<u>Execution Date</u>
Hartgrove, Herbert P.	18 April 2005
Tindall, Russell	18 April 2005
Carter, Nick M.	18 April 2005
McNaull, Cynthia Dawson	29 April 2005

Additional name(s) of conveying party(ies) attached?
☐ Yes ☒ No

2. Name and address of receiving party(ies):

Name: Polymer Group, Inc.
Street Address: 4055 Faber Place Drive
Suite 201
City: North Charleston
State: South Carolina
Zip: 29405

Additional name(s) address(es) attached?
☐ Yes ☒ No.

3. Nature of conveyance:

☒ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Other: _____

4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is:

A. Patent Application Number(s): 11/050,283

B. Patent Number(s): _____

Additional numbers attached: ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Wood, Phillips, Katz, Clark & Mortimer
Citicorp Center, Suite 3800
500 West Madison Street
Chicago, Illinois 60661-2511
Phone: (312) 876-1800

6. Total number of applications and patents involved: 1

7. Total Fee (37 CFR 3.41) \$40.00

☒ Enclosed
☐ Authorized to charge Deposit Account

8. Deposit Account No.: 23-0785

DO NOT USE THIS SPACE

9. SIGNATURE

Stephen D. Geimer, 28,846

Name of Person Signing



Signature

May 11, 2005

Date

Total number of pages including cover sheet, attachment, and documents: seven (7)

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2005 MAY 13 AM 10:41
FINANCE SECTION

Carrera 13 No. 27-00 Piso 5, 7 y 10
Conmutador: 3 82 08 40
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Bogotá, D.C., Colombia

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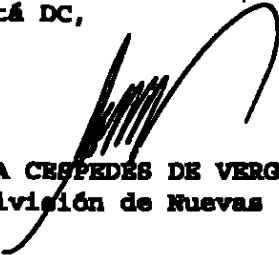
Doctor(a)
PINZON PINZON MAURICIO
Apoderado(a) y/o Representante de
POLYMER GROUP INC

REFERENCIA	Radicación No.	06 87985
	Solicitud internacional	PCT/US2005/003222
	Fecha inicio fase nacional	04/09/2006
	Trámite	11
	Evento	378
	Actuación	416
	Oficio No.	1890
	Folios	1

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en la Decisión 486 de la Comisión de la Comunidad Andina, el Tratado de Cooperación en Materia de Patentes (PCT), el Reglamento y la Circular Única de la Superintendencia de Industria y Comercio, se envía el extracto de la solicitud a la Oficina de Comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial.

Cúmplase
Dado en Bogotá DC,

17.NOV. 2006


ALIX CARMENZA CEPEDÉS DE VERGEL
Jefe de la división de Nuevas Creaciones

adpall