

Señora Jefe
DIVISIÓN DE NUEVAS CREACIONES
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
Bogotá, D.C.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 06-023143- -00003-0000

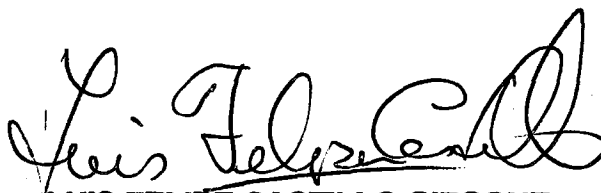
Fecha: 2008-05-14 14:11:31 Dep. 2020 NUECREACIONE
Tra. 11 PATENTEIYII Eve: 379 FASENACIONALI
Act. 538 PETICION Folios: 2

Re.: Expediente No. 06 23.143
Fase Nacional Solicitud de Patente PCT
a nombre de
SCHLUMBERGER TECHNOLOGY B.V.
Código 011 – 379 - 538

En relación con la solicitud contenida en el Expediente de la referencia y, en particular, con la publicación del extracto de la misma en la Gaceta de la Propiedad Industrial No. 583 de 18 de Diciembre de 2007, por medio del presente escrito muy respetuosamente me permito solicitarle se sirva proceder a efectuar el **EXAMEN DE PATENTABILIDAD** de la solicitud aquí contenida.

Para tal efecto, acompaño el comprobante de pago por concepto de la tasa respectiva, Recibo No. 38,149

De Usted Atentamente,


LUIS FELIPE CASTILLO GIBSONE
T.P. No. 68.995 del C.S.J.

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176009-2

RECIBO OFICIAL DE CAJA : 08 - 38,149
FECHA : MAYO 14 DE 2008

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Gr. PAGO
CASTILLO BRUN Y ASOCIADOS	CONSIGNACION	BANCO DE BOGOTA	062754387	2544577	13/05/2008	134,000.00
CASTILLO BRUN Y ASOCIADOS	CONSIGNACION	BANCO DE BOGOTA	062754387	25446117	13/05/2008	5,460,000.00

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

CANT. REQUERIDO	CONCEPTO	TOTAL CONCEPTO
1	114 PTC CAP-11 EXAMEN DE PATENTIBILIDAD	210,000.00
	TOTAL :	210,000.00

CON: MONEDERO UNO MIL PESOS

RESPONSABLE :

RECIBO DE CAJA ANEXADO AL EXPEDIENTE No. _____

discontinuous point-like deformations of the film layer. Preferred laminates according to this embodiment of the invention have a moisture vapor transmission rate according to ASTM E-96 Method E ("MVTR") of at least about 500 g/m²/day.

[0011] In another embodiment, the invention provides a process for making breathable composites of films and nonwoven fibrous webs comprising applying to a nonwoven fibrous web comprising thermoplastic resin a coating of molten, film-forming, thermoplastic resin composition capable of developing breathability, cooling the molten resin to form a coated web and applying heat and pressure to impart breathability to the coated web while substantially maintaining liquid barrier properties thereof.

[0012] Also provided is a process for making breathable composites of films and nonwoven fibrous webs comprising conducting a nonwoven fibrous web comprising thermoplastic resin with a film comprising a thermoplastic resin composition capable of developing breathability and applying heat and pressure to the film in contact with the web at a plurality of points to bond the web and the film and develop breathability of the film at such points.

DETAILED DESCRIPTION OF THE INVENTION

[0013] The composites according to this invention are textile- or fabric-like structures in the form of laminates comprising nonwoven web and film layers having a desirable combination of breathability and liquid barrier properties. They have utility in a wide range of applications for both durable and disposable fabrics. Examples include disposable gowns and coveralls for hospital and industrial workers, components of diapers, hygienic products and other medical uses. The composites also can exhibit a soft, cloth-like texture at one or both surfaces thereof due to the nonwoven web, thereby promoting utility of the composites in applications for which film-nonwoven fabric composites have not heretofore found use due to their cost and aesthetics, including their harsh or stiff texture. An example of such applications is components of hygienic products such as backsheet for disposable diapers, and incontinence products. Furthermore, the laminates can be manufactured by a facile process well suited to in-line operations, with bonding of the film and nonwoven web layers and development of breathability of the film layer being achieved without sacrifice in breathability or barrier properties and without need for separate formation of a breathable film or exotic smelting equipment to develop breathability after lamination.

[0014] The composites comprise a nonwoven fabric-breathable film laminate. In one embodiment, the breathable film-nonwoven fibrous web laminates are breathable materials with hydrostatic head of at least about 4 inches, wherein breathability of the film layer is provided by a plurality of point-like deformations of the film layer.

[0015] As used herein, the expression "plurality of point-like deformations" means a number of small depressions or compressed areas that penetrate into the depth of the film layer but do not perforate or form holes in the layer. The term "point-like" is used to indicate that the deformations

[0016] Another desirable feature of the composites is that the film layer of the nonwoven web can provide a desirable cloth-like texture at at least one surface of the laminates. A soft, fuzzy texture is obtained despite the thermal bonding of the film and nonwoven layers of the composites. Scanning electron micrographs of the composites show substantial adhesion of the film to the nonwoven fabric to the film at an interface between the layers but also a substantial presence of voids and gaps of filaments. In combination, the fluid barrier properties, vapor permeability and cloth-like texture of these composites make the same well suited for apparel and diaper applications.

[0019] The clothlike-textured laminates according to this embodiment of the invention are particularly well suited for diaper backsheet applications. Preferred composites for that use comprise a breathable film layer laminated to a nonwoven fabric layer and have MVTR of about 1000 to about 2500 g/m²/day, basis weights of about 10 to about 70 g/m² and hydrostatic head according to IST 80.4-92 of at least about 7 inches of water. Such composites have about 10 to about 30% of their surface area occupied by point-like deformations and about 100 to about 400 deformations per square inch. Thickness of the film layer of such composites for diaper backsheet preferably ranges from about 10 to about 55 microns because thinner films are difficult to produce without formation of holes, gaps and areas of nonuniform thickness while thicker films impart undesirable weight and stiffness. Thickness of the nonwoven fabric layer as present in such composites preferably ranges from about 70 to about 700 microns because thinner layers do not provide adequate fluidness or softness in the composites while thicker layers add cost with little if any additional benefit and also may not be as easily bonded to the film layer as are thinner layers. Dealer of the film layer of the nonwoven fabric layer of the composites for this application preferably range from about 1 to about 20 g/1000 m. In combination, the properties of such composites impart an ability to prevent passage of liquids but allow passage of water vapor for breathability and comfort under conditions of normal use. Furthermore, the soft, cloth-like surface of the composites has an appearance and texture much like that of conventional cloth diapers, thereby providing greater aesthetic appeal, including a less shiny surface than in conventional disposable diapers having a backsheet of nonadhesive plastic film.

[0020] In the inverted laminates, preferred compositions of the film and nonwoven fabric layers comprise polyolefin resin compositions, such as polyethylene, including low density polyethylene, high density polyethylene, linear low density polyethylene and so-called metallocene polyethylene, polypropylene and copolymers of ethylene and propylene. Other suitable resin compositions for the film layer comprise thermoplastic resins capable of being provided in the form of film and of developing breathability, for example as a result of inclusion therein of finely divided particulates or other polymers or other additives that promote development of a breathability on deformation of films containing such additives. Examples of other suitable film-forming resins include ethylene vinyl acetate, methyl acrylate and ethylene acrylic acid copolymer.

[0021] Additives used in the film-forming resins to promote development of breathability include various finely divided inorganic and organic particulates, other polymeric

resins and materials capable of promoting deviations in crystalline structure or properties within the film-forming resin. A preferred additive, owing to its cost, availability and effectiveness, is calcium carbonate. Other suitable particulates include talc, silica, clay, kaolin, alumina, aluminum hydroxide, magnesium, magnesium hydroxide, calcium silicate, calcium sulfate, boron nitride, aluminum silicate, calcium silicate, sodium silicate, potassium silicate, magnesium carbonate, calcium oxide, titanium dioxide, mica, glass fibers, cellulose, diatomaceous earth, perlite, vermiculite, glass microballoons, fly ash and glass beads. Polymeric resins that are incompatible with the film-forming resin in the sense that they are capable of reacting or substantially reacting their freely divided, particulate form through melt processing of the film-forming resin composition into film. Examples of crystalline-modifying agents include the non-crystalline form of a given resin, colorant such as pigments, dyes, the bottom salt of ortho-phthalic acid, titanium dioxide, the bottom salt of ortho-phthalic acid, the aluminum salt of sebacic acid, calcium stearate, stearic acid and lauric acid. Commonly such materials are or additives have a mean particle size of about 0.1 to about 10 microns and are present in the resin composition in amounts by weight based on weight of film-forming resin of about 0.1 to about 200 parts by weight. These additives are generally described as promoting development of a pore structure or interconnected network of pores, with the pore size being large enough, under the pathway through the film provided by the pores being large enough that the film permits passage of gases and not liquids at the pressure and pressure fluctuations in normal use of the films. A wide range of resin compositions and additives for forming breathable films are known in the art. See, for example, U.S. Pat. Nos. 4,359,655; 4,770,077; 4,928,303; 4,470,078; 4,592,031; 4,626,255; 4,794,126; 4,823,590; 4,244,563; 4,772,328; 4,704,238; 5,073,313; 4,699,733; 4,708,872; 4,703,813; 4,814,124; 4,815,623; 4,793,954; 4,813,462; 4,761,580; 4,791,144; 5,445,862; and 4,804,499, which are incorporated herein by reference.

[0022] For the fibrous nonwoven web layer, any thermoplastic resin capable of being formed into filaments, such as by melt spinning, spunbonded techniques, melt blowing and centrifugal spinning, and of bonding to the film-forming resin is suitable. As noted above, the polyolefin resins are preferred. Other suitable resins include polyesters, rayon, acrylics, polyamides and thermoplastic elastomer resins such as styrene-ethylene-butylene copolymers and copolyester esters. The composition of the film and fabric layers can be the same or different so long as adequate bonding of the layers at an interface therebetween can be achieved.

[0023] Particularly preferred laminates are those in which a film layer comprising a polyethylene resin composition is laminated to a nonwoven web layer in which the filaments comprise a polyethylene or polypropylene resin composition. Most preferably, the polyethylene resin composition of the film layer includes about 50 to about 150 parts by weight finely divided mineral particulates per hundred parts by weight polyethylene. Linear low density polyethylene, ultra low density polyethylene, so-called metallocene polyethylene and blends thereof are most preferred resins for the film layer while calcium carbonate is most preferred as the mineral particulate. Mean particle size of the particulates generally ranges from about 0.1 to about 10 microns, with about 0.5 to about 3 microns being preferred.

41

[0024] Other features of the invented laminates will be determined largely based on end use requirements. Generally, basis weights of about 10 to about 300 g/m² are well suited for a wide range of applications, although weights outside that range are also contemplated depending on end use requirements. Basis weights that are preferred for disposable apparel and hygiene applications range from about 10 to about 80 g/m². Layer thicknesses within the laminates can also be varied over a wide range in order to provide the laminates to intended uses. Thicknesses of the nonwoven fabric layers range from about 70 to about 700 microns in order to achieve a fuzzy, cloth-like texture at the surface formed by the fabric layer with good bonding between the nonwoven web and film layers of the laminates. Filaments of the nonwoven webs having deniers on the order of about 1 to about 10 g/9000 m provide a fine, soft texture, while higher denier filaments, for example on the order of about 20 g/9000 m or greater, provide a coarse surface. Film layer thicknesses preferably range from about 10 to about 50 microns because greater thicknesses may lead to laminates having undesirable stiffness while thinner layers are more prone to formation of pinholes and, accordingly, poor liquid barrier properties.

[0025] The invented laminates can be provided in various configurations. Multi-layered configurations of the nonwoven fabric and breathable film layers, optionally with one or more layers of similar or dissimilar materials, are contemplated and can provide beneficial and interesting properties for various applications. For example, lamination or bonding of the film layer to scrim or extruded nesting can provide additional strength and durability without sacrifices in breathability and liquid barrier properties. As another example, for applications calling for a breathable material having a cloth-like texture on both surfaces, a composite comprising at least one breathable film layer laminated between two outer surface layers of the nonwoven fabric can be provided. As a specific example of such a composite, a light weight laminate having an inner breathable film layer laminated to two outer surface layers of continuous filament nonwoven web, such as a polypropylene or polyethylene spunbonded or centrifugally spun web, provides a composite having a combination of breathability, liquid barrier properties, comfort, strength, light weight and low cost that is particularly well suited for disposable industrial protective garments.

[0026] The invented composites can be made by any suitable method for achieving effective bonding of the layers and localized deformation of the film layer effective to develop breathability, without lamination or other destruction of the surface of the fabric layer that forms an external surface of the laminate.

[0027] According to another aspect of the invention, there is provided a preferred method for making breathable filament nonwoven web laminates which can be constructed as an in-line process without pinhole formation detrimental to liquid barrier properties, thereby promoting process speed and high throughput. The process also avoids undesirable fusion of fabrics and promotes good surface texture of the resulting composites. It also is advantageous because it does not require forming the fabric and breathable film components of the laminates in separate operations.

[0028] The process according to this embodiment of the invention comprises applying to at least one surface of a

fibrous nonwoven web a coating of a molten, film-forming thermoplastic resin composition capable of developing breathability, cooling the molten resin to form a coated web having a film layer bonded to a web layer and applying heat and pressure to the coated web at a plurality of points on at least one surface thereof, with the heat, pressure, proportion of the composite surface area occupied by the point-like deformations and density of the deformations being effective to impart breathability to the composite while maintaining liquid barrier properties. Cooling of the nonwoven web with the film-forming resin composition provides a good bond between film and fabric layers. Breathability is provided as a result of deformation of the film surface at the points at which the heat and pressure are applied. This is accomplished without formation of pinholes in the film layer; accordingly, the resulting laminates have good liquid barrier properties.

[0029] Nonwoven fabrics suitable for use according to this embodiment of the invention include both continuous filament nonwovens, such as spunbonded and centrifugally spun fabrics, and fabrics comprising discontinuous or staple fibers, such as carded staple fiber webs, needlepunched nonwovens, hydroentangled webs and the like. Melt blown webs of continuous or discontinuous fibers also may be suitable although use of the resulting laminates in many applications is not practical due to the low strength of the webs. A preferred meltblown web is that described in U.S. Pat. No. 5,609,808. Preferred nonwoven fibrous webs are continuous filament nonwoven fabrics and particularly these having sufficient strength and integrity in both the machine and cross directions that they can be used in manufacture of the invented composites without prior thermal or adhesive bonding. An example of such a web is the continuous filament nonwoven fabric identified as RFX60 Fabric available from Amoco Fabrics and Fibers Company. Lightly calendared or print bonded spunbonded webs, RFX60 Fabrics and other centrifugally spun continuous filament webs also are good choices as are needlepunched staple fiber webs and thermally bonded, carded staple fiber webs.

[0030] The filaments of the nonwoven webs can comprise any suitable material capable of bonding with the film-forming resin on cooling therewith. Although the fabrics can be composed of or contain natural fibers, preferred nonwovens are those comprising synthetic filaments or fibers of one or more thermoplastic resin compositions. Polyolefin filaments and fibers, and particularly those comprising polypropylene, a polyethylene or a copolymer of ethylene and propylene are particularly preferred for many diverse applications due to their ease of processing, low cost, hydrophobicity, strength and resistance to mild, mildew and aqueous stains. Other suitable thermoplastic resins are those capable of being spun or otherwise processed into fibers; examples include polyesters, nylons, acrylic polymers and thermoplastic elastomers such as styrene-butadiene copolymers, styrene-ethylene-butylene copolymers and copolyester-elastomers.

[0031] The nonwoven fabrics or the filaments or fibers thereof can contain or have applied thereon various additives and modifiers. Such materials include pigments and colorants, antioxidants, stabilizers, antimicrobial agents, stain resisting additives, flame retardants and the like. These materials and their use are well known and suitable levels for

particular applications can be determined by persons skilled in the art or are related to such applications.

[0032] Other characteristics and features of the nonwoven fabrics used in the invented process can vary widely. Generally, there is no limit on the basis weights or filament deniers of the fabrics although practical considerations such as equipment size and configuration, process economics and use requirements may dictate requirements or preferences in one or more respects. Generally, basis weights of about 15 to about 80 g/m² and filament deniers of about 1 to about 15 g/9000 m are well suited for hygiene and disposable apparel applications. Heavier fabrics, such as those with basis weights of about 40 to about 150 g/m², and/or those with coarser filaments, such as those with deniers of about 5 to about 25 g/9000 m are preferred for applications having more demanding requirements in terms of strength and durability, such as roofing underlaminates.

[0033] The film-forming resin composition that is applied in molten form to the nonwoven fabric according to the invented process comprises at least one thermoplastic resin that can be melted and formed into film and can bond to the fabric. The film-forming composition also must be capable of developing breathability on deformation thereof. Various film-forming thermoplastic resins are well known examples used in the invention process include polyolefins such as polypropylene, polyethylene and copolymers of ethylene and propylene, ethylene vinyl acetate copolymers, ethylene methyl acrylate copolymers and ethylene acrylic acid copolymers. Preferred resins are polypropylene, high density polyethylene, linear low density polyethylene, metallocene polyethylene and so-called ultra low density polyethylene.

[0034] The film-forming resin composition also comprises one or more additives that promote or enhance development of breathability in the film upon deformation. A wide range of such additives is known and includes inorganic and organic particulates, other polymeric resins, and agents capable of promoting crystalline modifications that can be exploited to achieve breathability. Further description and examples of such materials are provided above.

[0035] These breathability-promoting additives are used in amounts effective to promote development of breathability in the film-forming resin when coated onto the fibrous web and subjected to heat and pressure. Generally, about 40 to about 210 parts by weight of the additive is used per hundred parts by weight resin, with about 80 to about 120 parts per hundred parts resin being preferred to promote desirable levels of breathability without compromising film formation due to high levels of additives. Mean particle size of the additives is generally about 0.1 to about 10 microns, with about 0.5 to about 5 microns being preferred, again to facilitate development of breathability without compromising film extrusion.

[0036] Various resin compositions and additives for forming breathable films are disclosed in the patents listed and incorporated by reference heretofore. The film-forming resin composition can also contain various additives, fillers and modifiers. Examples include pigments and colorants, heat, light and oxidation stabilizers and process aids. These materials and their use, including formulation and compounding thereof with appropriate resins and amounts of specific additive compositions and combinations thereof

effective for various purposes, are well known to persons skilled in the film manufacturing and converting arts.

[0037] According to the process of this embodiment of the invention, the film-forming resin composition, including breathability-promoting additive, is coated onto the fibrous web with the film-forming resin in a molten state, the resin is cooled to solidify the same and form a coated web, and the coated web is subjected to heat and pressure at a series of points on the surface thereof to provide a plurality of point-like deformations in the film and develop breathability. Preferably, heat and pressure are applied using an entrenching roll engraved to provide a plurality of points. As in the previous description of the invented composites, the term "point", as used in describing the invented method, refers to a localized or discrete area but is not otherwise to be considered limited as to size or shape.

[0038] Coating of the web with the film-forming resin composition capable of developing breathability can be conducted by any suitable means for applying a coating of molten resin continuously over a surface of the web. It is to be understood that the coating is applied continuously over the surface of the web in the sense that there are not gaps, interruptions or discontinuities in the coating that leaves portions of the surface of the web uncoated. It is preferred that the coating be applied to the web so that the thickness of the coating is substantially uniform. Most conveniently, application of the coating to the web is accomplished by extrusion coating a surface of the web with the composition with the film-forming resin in a molten state. Extrusion coating techniques are well known and generally involve melting and working the resin composition as it passes through an extruder barrel due to rotation of a screw located within the barrel and forcing the molten composition from a die. Extrusion conditions vary depending on choice of film-forming composition and melt viscosity thereof, but generally include temperatures of about 50 to about 170° C., and preferably about 100 to about 150° C., above the melting or softening temperature of the thermoplastic resin included in the composition. For example, when using filled film-grade polyethylene resins melting at about 125° C., typical extrusion temperature range from about 180 to about 280° C.

[0039] The molten film-forming resin composition is extruded coated onto a surface of the nonwoven web. Preferably, the molten resin is coated onto the web at or slightly upstream from a nip formed by rotating rolls. The rolls exert a force on the coated web as it passes through the nip, thereby promoting bonding of the extended coating to the filaments of the web. Nip forces of about 10 to about 120 pli preferably are employed to achieve good bonding of the coating to the web at the interface between such layers without damage to the filaments. More preferably, nip forces applied to the web at the interface of the web at the web surfaces opposing such interfaces. More preferably, nip forces range from about 30 to about 90 pli. Roll temperatures can be varied as needed to cool the molten resin and solidify the same while also preventing heat transfer from the molten resin to the web to such an extent as to fuse or otherwise damage the filaments of the web at the surface opposing the web-coating interfaces. Line speeds will vary depending on equipment configuration and capabilities and process economics. Generally, the coating process can be operated at line speeds of about 20 to about 700 feet/min, with good results.

43
42

[0040] The resulting coated fabric is then subjected to heat and pressure at a plurality of points on a surface thereof for the purpose of developing breathability of the film layer. Application of heat and pressure to the coated web at a number of points on the surface thereof served to define the film layer at and near the points. On deformation of the film layer, the breathability-promoting additive promotes development of breathability of the film. Application of heat and pressure, together with the density and area of the points, are controlled so that adequate breathability of the film layer, and in turn the composite, is achieved without sacrificing liquid barrier properties due to formation of holes in the film. Heat and pressure can be applied to the coated fabric at either or both of the web surface and the coated surface with good results. Usually, application of heat and pressure to the web surface tends to promote cloth-like texture of the web surface of the resulting laminate to a greater extent than application to the film surface. Other things being equal, it also may provide composites of greater breathability.

[0041] Generally, temperatures and pressures employed during the application of heat and pressure are great enough to cause deformation in the depth of the film layer without making holes in the same and without fusion of filaments of the nonwoven web layer at or near the points into impermeable masses. As will be appreciated, temperatures and pressures will vary depending on melting points of the resins of the film and nonwoven web layers, thicknesses of the layers and degree of breathability desired in the laminated structure. Preferably, temperatures of about 100° C. below the melting point of the film-forming resin up to the melting point are employed to achieve suitable deformation without pinhole formation. More preferably, temperatures about 20 to about 50° C. below the melting point are used. When the film-forming resin composition comprises a blend of resins having different melting temperatures, temperatures used in the deformation step are typically based on the melting point of the primary resin of the composition, e.g., that constituting the greatest weight fraction of the film-forming composition. For in-line processes in which coating of the web with the film-forming composition and deformation are conducted continuously, preferred deformation temperatures range from about 70 to about 220° C. below the extrusion temperature of the film-forming resin composition. Nip forces preferably range from about 200 to about 2000 psi. The number of points per unit area and proportion of the composite surface area occupied by the deformations also affect the degree of breathability. Laminates with points occupying from about 8 to about 40% of their surface area and with about 100 to about 500 points per square inch have breathabilities, as indicated by MVTRs of at least about 500 g/m²/day, well suited for a wide range of applications.

[0042] A preferred method of applying heat and pressure at a plurality of points on the surface of the coated web is to pass the same through an embossing roll system in which at least one roll has been engraved or otherwise conditioned or treated to impart a plurality of raised points or areas to the surface thereof. The raised points or areas can, though need not, be disposed in a repeating pattern on the surface of the roll. The points can be of any desired shape. Examples are described above. For application of heat and pressure to laminates in which the nonwoven web layer is composed of polyethylene or polypropylene filaments and the web is coated with a film layer comprising a polyethylene or thermoplastic resin, temperatures ranging from about 140 to

about 220° F., nip forces of about 300 to about 1500 pli, and embossing patterns with points occupying about 8 to about 40% of the laminate's surface area with about 100 to about 500 points per square inch can be used with good results. Multiple passes through an embossing roll system or passage through two or more embossing systems arranged in series can be utilized to vary the degree of breathability of the laminates. Temperatures of the embossing rolls also can be adjusted to control breathability, with higher temperatures generally providing higher MVTRs.

[0043] In a preferred embodiment of the invention, the above described method is utilized to prepare breathable laminates in which the film-forming resin is a thermoplastic resin, the film-forming resin is extruded as a melt onto a nonwoven web of substantially continuous polyolefin filaments, the film-forming resin composition is cooled to form a coated web having a film layer bonded to the web, and the coated web is point embossed at a temperature of about 140 to about 230° F. and nip force of about 700 to about 1500 pli such that about 8 to about 40% of the surface area of the coated web is occupied by embossed points and the points are present on a surface of the laminate at a density of about 100 to about 500 points per square inch.

[0044] According to another aspect of the invention, there is provided a method for making breathable film-thickness nonwoven web laminates comprising combining a nonwoven web laminates comprising combining a nonwoven fibrous web comprising thermoplastic filaments with a film comprising a thermoplastic resin composition capable of developing breathability and applying heat and pressure to the film in contact with the web at a plurality of points to bond the web and the film at a plurality of points and form a plurality of point-like deformations of the film. Compositions and configurations of the film and web components used in the method according to this aspect of the invention are described above. The thermoplastic resin compositions capable of developing breathability typically are extruded to form film at temperatures of about 50-120° C. above the melting point of the thermoplastic resin of which the film is composed. Preferred temperatures for deforming such films to impart breathability and seal bonding of the film to the web layer range from about 30° C. below to about 100° C. above the melting point of the film-forming resin on, in the case of film-forming resin blends, the majority, melt-melting primary resin. More preferably, temperatures range from about 20° C. below to about 50° C. above melt-melting point are used. For purposes in which a free-standing film is at and the feed directly is equivalent for bonding with the web layer and deformation, particularly preferred temperatures for the bonding and deformation step range from about 40 to about 160° C. below the film extrusion temperature. In other respects, the process according to this aspect of the invention is carried out in a manner similar to that described above with respect to subjecting a coated web to heat and pressure to provide a plurality of point-like deformations on the surface of the composite.

[0045] The invention is described further in connection with the following examples, it being understood that the

same are for purposes of illustration and not limitation. In the examples, the following test methods were used:

- [0046] Moisture Vapor Transmission Rate (MVTR): ASTM E-96 Method B;
- [0047] Water Resistance Hydrostatic Pressure Test ("HT"): IST 80.4-92;
- [0048] Melt Index ("MI"): ASTM D1238 Condition B (190° C., 2.16 kg weight);
- [0049] Tensile Strength: ASTM D5034-95.

[0050] The following materials were used:

[0051] Polyethylene (Concater): A masterbatch, identified as LC7-788X from A. Seimann, Inc., Akron, Ohio, consisting of a blend of two linear low density polyethylene resins and 68.3 weight % calcium carbonate powder having a median particle size of 0.7 microns, identified as Onyxcarb UPT. The masterbatch had a MI of 3.5 g/10 minutes and contained 1.20 g/10 minutes MI, 0.918 g/cm³ density linear low density polyethylene and 20.0 g/10 minutes MI, 0.924 g/cm³ density linear low density polyethylene. MI of the polyethylenes, before addition of calcium carbonate, was 8 g/10 minutes.

[0052] LDPE: A linear low density polyethylene having MI of 1.0 g/10 minutes and density of 0.933 g/cm³ identified as Dowlex® 2038 from The Dow Chemical Company.

[0053] ULDPPE: A polyolefin plastomer resin having MI of 1.0 g/10 minutes and density of 0.87 g/cm³ identified as Affinity EG 8100 from The Dow Chemical Company.

[0054] Fabric A was a light weight, point embossed, nonwoven web of substantially continuous polypropylene filaments having average basis weight of 20.0 g/m² (0.59 oz/yd), machine direction elongation of 97% and cross direction elongation of 168%, with a 16% bonded area, 30 points per square cm (194 points per square inch) diamond bonding pattern, identified as RFX® fabric made by Amoco Fabrics and Fibers Company.

[0055] Fabric B was a 32 g/m² (0.04 oz/yd) average basis weight, polyethylene continuous filament nonwoven web point embossed in the same manner as Fabric A having machine direction elongation of 118% and cross direction elongation of 252%, identified as RFX® fabric made by Amoco Fabrics and Fibers Company.

[0056] Fabric C was a polyethylene RFX® fabric that was the same as Fabric B except it had average basis weight of 17 g/m² (0.5 oz/yd).

[0057] Fabric D was a polypropylene RFX® fabric that was the same as Fabric A except it had average basis weight of 22 g/m² (0.66 oz/yd), machine direction elongation of 62% and cross direction elongation of 166%.

[0058] Each of Fabrics A, B, C and D was made substantially according to the procedure of commonly assigned U.S. Pat. No. 5,173,356.

[0059] Fabric E was a web of thermally bonded, coated polypropylene staple fiber having average basis weight of 20 g/m² (0.59 oz/yd), machine direction elongation of 44% and cross direction elongation of 78% manufactured by Amoco Fabrics Division, Niederrisinger der Amoco Deutschland GmbH.

EXAMPLE 1

[0060] A resin mixture was prepared by compounding 70 parts by weight Polyethylene Concentrate, 10 parts by weight LDPE and 20 parts by weight ULDPPE to a 34 mm co-rotating, intermeshing twin screw extruder at 200° C. at a rate of 30 kg/hr. Extruded strands were water quenched and cut into pellets approximately 3 mm long by 4 mm in diameter. The resin pellets were immediately fed 4 hours at 1.5 mm kg vacuum at 60° C. MI of the compounded resin was 1.1 g/10 min.

[0061] The compounded resin was extruded as a 20x (0.8 mil) thick, 13 cm (5.25 inch) wide film onto Fabric A passing from an unwind roll to a chill nip-roll combination at a speed of 24 m/min (80 ft/min). The extrusion was conducted using a 2-inch diameter, single screw extruder with a slot die. The resin temperature in the extruder barrel was 246° C. The resin was extruded onto the fabric immediately upstream of the nip between the chill and nip rolls and the resulting coated fabric was passed through the nip between the rolls and to a take-up roll. The chill roll had a smooth steel surface and was maintained at about 30° C. with circulating water. The nip roll was a hard rubber roll. Force at the nip was about 9 kg/cm (50 pounds per linear inch ("pli")). Average basis weight of the resulting laminate was about 80 g/m² (2.3 oz/yd). It had average MVTR of 52 g/m²/day and hydrostatic head greater than 50 inches of water.

[0062] A coated web prepared as described above was point embossed by passage between a smooth steel roll and a second steel roll engraved to provide 194 bond points per square inch and a bonded area of 16% with the bonding points extending to a height of 0.033 inch from the base of the roll. The points were in the shape of elongated diamonds with their longer dimensions oriented in the machine direction, i.e., axially relative to the roll surface, and their shorter dimensions in the cross direction, i.e., parallel to the axis of the roll. The rolls were heated at 110° F., pressure 15 ft/min. between the rolls was 1427 pli and line speed was 13 ft/min. The coated web was passed through an embossing nip roll with the web surfaces in contact with the engraved roll and the coating surface in contact with the smooth roll.

[0063] The resulting laminate had average MVTR of 1361 g/m²/day, HH of 7.5 inches water and weight of 64 g/m² (1.9 oz/yd). It is believed that basis weight of this sample was less than that of the coated web described above due to basis weight variations among different samples of Fabric A. Texture of the laminate at the surface formed by the fabric was soft and cloth-like.

EXAMPLE 2

[0064] A coated web was prepared substantially as in Example 1 except that Fabric B was used, thickness of the film layer extruded onto the web was 0.185 mil, width of the sample was 4.3 inches, melt temperature during extrusion was 246° C. and take up speed was 62 ft/min. The resulting coated web had average MVTR of 44 g/m²/day, hydrostatic head of 30.5 inches of water and weight of 73 g/m² (2.15 oz/yd). A sample of the coated web was point embossed as in Example 1 except the force at the nip between the engraved and smooth rolls was increased to 1600 pli. The resulting laminate had average MVTR of 940 g/m²/day, HH of 7.2

43

inches water and weight of 75 g/m² (2.2 oz). Texture of the web surface of the laminate was soft and cloth-like.

EXAMPLE 3

[00645] Compounded resin as in Example 1 was extruded into film having a thickness of about 0.5-0.7 mil and width of 16 inches using a 2.5 inch diameter extruder with a 1.6 inch flat film die with the die gap set at 0.01 inch. The extruder was operated at 380° F. melt temperature and 4.5 rpm gear pump speed. The film was extruded onto a quenched roll heated at 100° F. operated at a speed of 40 ft/min and passed to a take up roll also operated at 40 ft/min. The resulting film had average MVTR of 46 g/m²/day, indicating that it was substantially impervious. Average basis weight was 26 g/m² (0.75 oz). The film was not tested for HH due to its substantially impervious nature.

[00646] A sample of the film was laminated to Fabric A by point embossing substantially as in Example 1 except that temperatures of the smooth and engraved rolls were 235° F., force at the nip between the rolls was 555 pli and line speed was 160 ft/min. The resulting laminate had average MVTR of 1066 g/m²/day, HH of 9.7 inches water and weight of 47 g/m² (1.4 oz). Texture of the laminate at the surface formed by the fabric was soft and cloth-like.

EXAMPLE 4

[00647] A sample of the film from Example 3 was laminated to Fabric C by point embossing substantially as in Example 1 except that temperatures of the smooth and engraved rolls were 210° F., force at the nip between the rolls was 555 pli and line speed was 160 ft/min and average MVTR of 1319 g/m²/day. The resulting laminate had average MVTR of 1319 g/m²/day, HH of 8.4 inches water and weight of 49 g/m² (1.4 oz). Texture of the laminate at the surface formed by the fabric was soft and cloth-like.

[00648] The above procedure was repeated except that the point embossing was conducted with the coating surface contacting the engraved roll and the web surface contacting the smooth roll. Average MVTR of the result was 789 g/m²/day and average HH was 8.0 inches of water.

[00649] As seen from the foregoing, MVTRs of the coated webs in Examples 1 and 2, before deformation by point embossing, and of the uncoated film in Example 3, were in the range of 40-50 g/m²/day, indicating that they were substantially impervious. However, deformation of the film layers in all of the examples resulted in MVTRs in excess of 500 g/m²/day, with most of the examples being about 1000-1500 g/m²/day, thus indicating good breathability. Further, it can be seen that such MVTRs were achieved with good liquid holdout, as indicated by HH values above 7 inches of water. This combination of properties in a point embossed breathable film—nonwoven web laminate was surprising in view of prior art teachings that point bonding of porous films to nonwoven webs tends to cause formation of pinholes in the films and, as a result, poor liquid barrier properties. In view of prior art teachings regarding the need for stretching or deformation of films in their lengthwise or widthwise dimension to develop breathability, attainment of the MVTRs of the laminates in Examples 1-4 by application of heat and pressure to form a plurality of point-like deformations was thus unexpected.

EXAMPLE 5

[00650] Fabric D was extruded coated with a 1 mil film as in Example 1. Samples of the coated fabric were point

embossed at 550 pli using equipment as in Example 1 but with variations in roll temperatures and number of passes through the embossing roll system. Conditions and average MVTRs and HHs of the resulting laminates are shown below.

SAMPLE	CONDITIONS	MVTR(g/m ² /day)	HH (inches of water)
A	1 pass/160° F.	152	17.3
B	4 passes/160° F.	756	8.0
C	1 pass/180° F.	177	9.0
D	4 passes/180° F.	1941	6.0
E	1 pass/210° F.	880	6.7

[0071] As seen from the table, multiple passes through the embossing rolls and/or variations in embossing temperatures can be utilized to achieve varying levels of breathability and liquid barrier properties. It can also be seen that comparable levels of MVTR and HH can be achieved at different temperatures by varying the number of passes.

EXAMPLE 6

[0072] Fabric D was extruded coated with a 1 mil film as in Example 1. Samples of the coated fabric were point embossed at 550 pli in the same manner as in Example 5 except that the embossing roll was an engraved roll with a continuous inverted wave pattern having 432 hand points per square inch with the points extending to a height of 0.020 inch from the base of the roll. The points occupied about 57% of the area of the composite. Samples were embossed at various temperatures, as shown below. Average MVTRs and HHs of the resulting laminates are also shown below.

SAMPLE	TEMPERATURE	MVTR(g/m ² /day)	HH (inches of water)
F	160° F.	857	10.2
G	180° F.	1359	10.2
H	210° F.	2582	8.5

[0073] As seen from the table, variations in embossing temperature can be utilized to achieve varying levels of breathability and liquid barrier properties. Texture of the web surface of the resulting composites was soft and cloth-like though less so than in the previous examples due to the greater proportion of the area of the composite occupied by the point-like deformations.

EXAMPLE 7

[0074] A sample of Fabric E was extruded coated with a 1 mil film as in Example 1. Samples of the coated fabric were point embossed at 833 pli using equipment as in Example 1 but with variations in roll temperatures and number of passes through the embossing roll system. Conditions and average MVTRs and HHs of the resulting laminates are shown in the following table.

Comparative Example 1

[00800] A sample of the film prepared in Example 1 was stretched in a manner similar to that described in U.S. Pat. No. 4,316,892. The extent of the stretching was such that the ratio of stretched length of the film to unstretched length was 1.25:1 in the machine direction and 1.12:1 in the cross direction. The stretched film had an average MVTR of 1293 g/m²/day; however, results for individual samples ranged from a low of 288 g/m²/day to a high of 2791 g/m²/day, thus indicating that the results of the stretching were highly variable. Similarly, hydrostatic head of the stretched film showed considerable variability, ranging from 7.5 to 13 inches of water and averaging 11.3 inches of water. Average weight of the stretched film was 19 g/m² (0.55 oz).

Comparative Example 2

[00801] The laminate from Example 4 was stretched approximately 12% in each of the machine and cross directions following substantially the procedure of Comparative Example 1. Numerous pinholes were observed at the coated areas of the resulting laminate. It was not tested for MVTR or HH because the presence of the pinholes indicated that HH would not be acceptable.

Comparative Example 3

[00802] A sample of the film prepared in Example 3 and Fabric A were passed through the point embossing rolls as in Example 3 with the rolls heated at 220° F. The film and fabric layers of the resulting structure separated when gently stretched, showing poor adhesion between the layers.

We claim:

1. A breathable composite having hydrostatic head according to IST 80.4-92 of at least about 4 inches comprising a laminate of at least one fibrous, nonwoven web layer and at least one nonporous, breathable film layer, wherein breathability is provided by a plurality of point-like deformations of the film layer;
2. The composite of claim 1 having a MVTR of at least about 500 g/m²/day;
3. The composite of claim 2 wherein the fibrous nonwoven web layer comprises filaments comprising at least one polyolefin resin;
4. The composite of claim 2 wherein the thermoplastic, breathable film layer comprises at least one polyolefin resin;
5. The composite of claim 2 wherein the thermoplastic, breathable film layer comprises at least one polyolefin resin and the nonwoven web layer comprises filaments comprising at least one polyolefin resin;
6. The composite of claim 5 having a cloth-like texture at least one surface thereof;
7. The composite of claim 5 having a hydrostatic head of at least about 7 inches;
8. The composite of claim 7 wherein the polyolefin resin of the thermoplastic, breathable film layer comprises at least one polypropylene resin;
9. The composite of claim 8 wherein the polyolefin resin of the filaments comprises at least one polyethylene resin;
10. The composite of claim 8 wherein the polyolefin resin of the filaments comprises at least one polypropylene resin;
11. The composite of claim 7 wherein the polyolefin resin of the thermoplastic, breathable film layer comprises at least one polypropylene resin;

[0076] This example demonstrates that composites with useful combinations of breathability and liquid barrier properties can be obtained using a curved single fiber web as the fabric or web component of the laminate. It can also be seen from the table that multiple passes through the embossing rolls and variations in embossing temperatures can be utilized to achieve varying levels of breathability and liquid barrier properties, and that comparable levels of MVTR and HH can be achieved at different temperatures by varying the number of passes.

EXAMPLE 8

[0076] Fabric B was extruded coated with a 1 mil film as in Example 1. Samples of the coated web were point embossed at 833 pli in the same manner as in Example 6. Roll temperatures and average MVTRs and HHs of the resulting composites are shown below.

SAMPLE	TEMPERATURE	MVTR(g/m ² /day)	HH (inches of water)
N	160° F.	616	12.5
O	180° F.	1475	10.0
P	210° F.	4923	6.7

[0077] As seen from the table, variations in embossing temperatures resulted in varying levels of breathability and liquid barrier properties.

EXAMPLE 9

[0078] Fabric E was extruded coated with a 1 mil film as in Example 1. Samples of the coated fabric were point embossed at 550 pli as in Example 5 except that the engraved roll had 566 hand points per square inch and 22% of its surface area occupied by the points. The points were in the shape of elongated diamonds with their longer dimension oriented in the cross direction. Height of the hand points above the base of the roll was about 0.030 inch. Temperature was varied from run to run and is shown below together with average MVTRs and HHs of the resulting laminates.

SAMPLE	TEMPERATURE	MVTR(g/m ² /day)	HH (inches of water)
Q	160° F.	87	27.7
R	180° F.	1481	12.3
S	210° F.	657	10.5

[0079] Again, variations in embossing temperature resulted in changes in breathability and liquid barrier properties of the laminate.

48
44

12. The composite of claim 11 wherein the polyolefin resin of the filaments comprises at least one polyethylene resin.
13. The composite of claim 11 wherein the polyolefin resin of the filaments comprises at least one polypropylene resin.
14. A breathable composite comprising a laminate comprising at least one breathable film layer and at least one nonwoven web layer, wherein the breathable film layer comprises a polyolefin resin and a finely divided particulate material capable of promoting breathability, the nonwoven web layer comprises filaments of at least one polyolefin resin, and breathability is provided by a plurality of embossed, point-like deformations of the film layer, such points occupying about 8 to about 40% of the area of a surface of the composite and being present on each surface at a density of about 100 to about 500 points per square inch.
15. The composite of claim 14 wherein the polyolefin resin of the breathable film layer comprises at least one polyethylene resin.
16. The composite of claim 15 wherein the nonwoven web layer comprises a web of substantially continuous filaments.
17. The composite of claim 16 wherein the filaments comprise at least one polypropylene resin.
18. The composite of claim 17 having a cloth-like texture at at least one surface thereof.
19. The composite of claim 16 wherein the filaments comprise at least one polyethylene resin.
20. The composite of claim 19 having a cloth-like texture at at least one surface thereof.
21. The composite of claim 15 wherein the nonwoven web layer comprises a web of staple fibers.
22. The composite of claim 21 wherein the staple fibers comprise at least one polypropylene resin.
23. The composite of claim 22 having a cloth-like texture at at least one surface thereof.
24. The composite of claim 21 wherein the staple fibers comprise at least one polyethylene resin.
25. The composite of claim 24 having a cloth-like texture at at least one surface thereof.
26. The composite of claim 14 wherein the polyolefin resin of the breathable film layer comprises at least one polypropylene resin.
27. The composite of claim 14 wherein the nonwoven web layer comprises a web of substantially continuous filaments comprising at least one polypropylene resin.
28. The composite of claim 14 wherein the nonwoven web layer comprises staple fibers comprising at least one polypropylene resin.
29. The composite of claim 14 wherein the nonwoven web layer comprises a web of substantially continuous filaments comprising at least one polyethylene resin.
30. The composite of claim 14 wherein the nonwoven web layer comprises staple fibers comprising at least one polyethylene resin.
31. A process for making a breathable composite comprising applying to at least one surface of a fibrous nonwoven web a coating of a molten, film-forming thermoplastic resin composition capable of developing breathability, cooling the molten resin to form a coated web and applying heat and pressure to the coated web at a plurality of points on a surface of the coated web, with the heat, pressure and density of the points being effective to impart breathability while maintaining liquid barrier properties.
32. The process of claim 31 wherein heat and pressure are applied to the coated web by point embossing the coated web.
33. The process of claim 32 wherein the film-forming resin composition is applied to the web by extrusion coating.
34. The process of claim 33 wherein the web comprises substantially continuous filaments comprising a thermoplastic resin.
35. The process of claim 33 wherein the web comprises staple fibers comprising a thermoplastic resin.
36. A process for making a breathable composite comprising contacting a nonwoven fibrous web comprising filaments of a thermoplastic resin with a film comprising a thermoplastic resin composition capable of developing breathability and point embossing the film in contact with the web under conditions of temperature, pressure and density of embossing points effective to adhere the film to the web and develop breathability in the film.
37. The process of claim 36 wherein the filaments of the web comprise at least one polypropylene resin.
38. The process of claim 36 wherein the filaments of the web comprise at least one polyethylene resin.
39. The process of claim 36 wherein the thermoplastic resin of the film comprises at least one polypropylene resin.
40. The process of claim 36 wherein the thermoplastic resin of the film comprises at least one polyethylene resin.
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47
46

**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES**

2020

Abogado
/ **LUIS FELIPE CASTILLO GIBSON**
Apoderado

ASUNTO	Radicación	06-23143
	Trámite	002
	Evento	001
	Actuación	430 9682
	Oficio	
	Folios	010

Patente de Invención	☒	Patente de Modelo de Utilidad	☐
Vía Nacional	☐		
Vía PCT (fase nacional)	☒	Cap. I	☐ Cap. II ☐

No. Sol. Internacional	<u>PCT/EP2004/009489</u>
Fecha de Presentación Internal.	<u>25 de agosto de 2004</u>

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados

- | | | |
|------|--------------------------|---|
| 1.1. | <u>Descripción:</u> | Folios: 8 a 20 |
| 1.2. | <u>Reivindicaciones:</u> | Folios: 21 a 23 |
| 1.3. | <u>Prioridad:</u> | 8 de septiembre de 2003, GB No. 0320938.4 |

2. Objeto de la invención

- El Título de la solicitud es: **"ADITIVO DE CEMENTO DE DOBLE FUNCION"** (Folio 1).
- La presente invención se refiere al uso de aditivos en suspensiones de cemento y en particular, al uso de este tipo de aditivos en suspensiones y operaciones de cementación de pozos.

En la **Reivindicación Independiente 1** se plantea un método para controlar el fraguado de una lechada de cementación de pozo que comprende la adición de uno o más silicatos o sílice y un retardador de fraguado a la lechada de cementación de pozo; la cantidad de silicato o sílice que se agrega a la lechada es suficiente para realzar el efecto de retardo del retardador de fraguado bajo condiciones de fondo de pozo cuando se compara con el efecto de retardo del retardador solo, y también es suficiente para acelerar el fraguado de cemento bajo condiciones cercanas a superficie cuando se compara con el fraguado de cemento que contiene el retardador y **caracterizado en que la adición del sílice o silicatos permite el uso de una menor cantidad de retardador que se utilizaría solo para un efecto de retardo determinado en la temperatura de uso de fondo de pozo.**

En la **Reivindicación Independiente 18** se plantea un retardador par uso en lechadas de cementación de pozo, el cual comprende una mezcla de un retardador de fraguado y uno o más silicatos o sílice; las cantidades relativas de retardador de fraguado y silicatos o sílice son tales que el efector retardador del retardador de fraguado bajo condiciones de fondo de pozo es mejorado si se compara con el efecto retardador del retardador solo, y el fraguado del cemento bajo condiciones cercanas a la superficie es acelerado si se compara con el fraguado del cemento que contiene el retardador y **caracterizado en que la adición de sílice o silicatos permite el uso de una menor cantidad de retardador que se usaría solo para un efecto retardador determinado en la temperatura de uso de fondo de pozo.**

- En la descripción de la solicitud en estudio se afirma que en la actualidad no existe una forma de implementación fácil para controlar las propiedades de fraguado de dichos cementos de modo que puedan ser útiles para usos de cementación de pozos.
- El objeto de la invención definido se catalogó como **E21B 33/13**, según la Clasificación Internacional de Patentes (IPC).

3. De la solicitud de Patente

3.1. Reivindicaciones (artículo 30 D 486)

- En la reivindicación independiente 1 se plantea un método para controlar el fraguado de una lechada de cementación de pozo y en la reivindicación independiente 18 se plantea un retardador para uso en lechadas de cementación de pozo. Ambos inventos, método y producto se caracterizan mencionando que **“la adición de sílice o silicatos permite el uso de una menor cantidad de retardador que se utilizaría solo para un efecto de retardo determinado en la temperatura de uso de fondo de pozo”** (Negrita Personal).

En primer lugar, se está caracterizando un método y un producto de la misma manera y esto es algo que no es posible técnicamente ya que un método normalmente se define como una secuencia de etapas encaminadas a la fabricación de un producto. En la caracterización de un método se mencionan las operaciones unitarias, condiciones de operación y demás detalles, mientras que en la caracterización de un producto se define la composición, estructura, forma, disposición, etc., según la naturaleza de dicho producto. Por ejemplo, si el producto es químico entonces se caracteriza por la mención de los elementos químicos y las proporciones en que se encuentran dentro de dicha composición química.

De otro lado, la información incluida en la parte caracterizante de las reivindicaciones 1 y 18 no consiste en la definición de la invención sino en la mención de las ventajas que se derivan de usar un retardador.

Dado lo anterior, se recomienda modificar la parte caracterizante de las reivindicaciones 1 y 18 de modo que en la primera se incluyan las etapas, secuencia de etapas del método, operaciones unitarias y/o condiciones de operación del método, y en la segunda se incluya la naturaleza de los componentes, las proporciones en las que se encuentra dentro de la composición y demás detalles que definan el producto.

- El capítulo incluye información repetitiva en diversas reivindicaciones (reivindicaciones 8 y 19, 9 y 20, 10 y 21, 11 y 22, 14 y 24). Se recomienda eliminar las reivindicaciones que contienen innecesariamente la misma información pues de esta manera se contribuye a la concisión, coherencia y claridad del capítulo.
- En conclusión, las reivindicaciones 1 y 18 no están definiendo la invención, requisito necesario según el artículo 30 de la Decisión 486.

4. Determinación del Estado de la Técnica

- La fecha que se ha tenido en cuenta para determinar el Estado de la Técnica es:

Fecha de presentación de la solicitud prioritaria: **8 de septiembre de 2003**

- Teniendo en cuenta la fecha indicada se realizó la búsqueda en el estado de la técnica de documentos relacionados con la solicitud encontrándose el siguiente documento:

Nº	Documento	Título	Fecha de publicación
D1	FR2667058	"COMPOSITION DE CIMENT PÉTROLIER, ADDITIFS CORRESPONDANTS ET APPLICATION À LA PRISE EN SURFACE"	27 de marzo de 1992

- Respecto al Estado de la Técnica

En el documento **FR2667058** (D1) se divulga la existencia de una lechada de cemento para cimentación de pozos, que contiene como aditivos específicos una combinación de silicato de sodio y de polinaftalensulfonato de sodio. Este sistema es particularmente insensible a la temperatura, permitiendo conservar las propiedades solicitadas en los cementos para pozos. Tiene aplicaciones en pozos profundos para la cimentación en superficie (Resumen).

D1 enseña el uso de un silicato retardador para cemento de pozos. Además, el uso de glucoheptonato y silicatos juntos, es algo que D1 enseña, pues se divulga añadir por ejemplo glucoheptonato como retardador (D1; Reivindicación 4).

En D1 se enseña que la cantidad de silicato de sodio que puede ser añadida es de 4,5 – 27 litros/ton de cemento (D1; Reivindicación 2).

5. Análisis de patentabilidad (artículo 14 D 486)

5.1. Novedad (artículo 16 D 486)

- Respecto a la invención de la solicitud

En la reivindicación independiente **1** se propone un método para controlar el fraguado de una lechada de cementación de pozo que comprende añadir uno o más silicatos o sílice y un retardador de fraguado a la lechada de cementación de pozo. No obstante, en D1 también se divulga la adición de silicato de sodio y un retardador de fraguado como es el glucoheptonato (D1; Reivindicación 4).

En la reivindicación independiente **18** se propone un retardador para uso en lechadas de cementación de pozo, el cual comprende una mezcla de un retardador de fraguado y uno o más silicatos o sílice. Sin embargo, en D1 también se divulga una lechada de cementación de pozo en la cual se mezcla un retardador de fraguado como el glucoheptonato y silicato de sodio.

Es importante mencionar que al encontrarse afectada la novedad de las Reivindicaciones independientes **1** y **18**, las cuales encierran el objeto de patentabilidad; sus correspondientes reivindicaciones dependientes, estarían señalando características particulares de inventos que no son novedosos, por consiguiente carecen de novedad.

Así las cosas, el método de control de fraguado de una lechada de cementación de pozo y el retardador no son Nuevos y por tanto no cumplirían con el requisito de Novedad de acuerdo con el artículo 16 de la Decisión 486.

6. Conclusión

- Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

Nº	Documento Nº	Reivindicaciones afectadas	Requisito que afecta
D1	FR2667058	1 – 26	Novedad

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de **60 días** contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.