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(54) NONWOVEN WIPING MATERIAL WITH IMPROVED QUATERNARY SALT RELEASE PROPERTIES

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(57) **ABSTRACT**

Fibrous webs that retain less of cationic lotion components are obtained by treating the fibers of the web with a solution of a chemical blocking material prior to soaking the web with a chemical lotion containing the cationic lotion component. The chemical blocking material can comprise at least one of a polyamide-epichlorohydrin resin; a polyamide resin; a melamine resin; or a high molecular weight cationic chemical compound. The resultant web material is suited for use in the manufacture of wet wipes and especially disinfectant wet wipes.

NONWOVEN WIPING MATERIAL WITH IMPROVED QUATERNARY SALT RELEASE PROPERTIES

BACKGROUND OF THE INVENTION

[0001] The present invention relates generally to a new and improved method for increasing the release of a cationic component of a lotion solution from a nonwoven wet wipe material and the wet wipe comprising cellulose material produced therefrom.

[0002] Nonwoven fibrous web material is commonly cut into individual wiping sheets. Some cut sheets may be used dry as absorbent wipers. More typically, the individual sheets are soaked or saturated with a chemical lotion suited for an intended end use, stacked and wrapped in a liquid tight package for subsequent dispensing. The chemical lotion often includes emulsifiers, pH buffers, perfumes and the like. The liquid tight packaging maintains the saturated condition of the wiping sheet until use. Such premoistened wiping sheets, also called wet wipes or simply, wipes, are commonly used by consumers for cleaning or wiping, particularly when wash water is not readily available or cannot be conveniently used. Absorption capacity of such wiping sheet for lotion solutions is an important property. A high wet tensile strength to resist tearing or puncturing of the wet wipe during dispensing and use is also very desirable. Drapeability and hand of the wet wipe are further important to achieve the "feel" required for customer acceptance.

[0003] Very recently, disinfectant wet wipes saturated with chemical lotions including disinfectant materials have become available. Previous wet wipes may have included biological control agents, however these agents were only intended to prevent growth within the wet wipe and liquid tight packaging during storage and prior to use. Disinfectant wet wipes include stronger disinfectant materials in amounts sufficient to dispense the disinfectant material to a wiped surface. Use of such wipes may leave a small amount of disinfectant material on the wiped surface. Contact with the disinfectant material, either saturated in the wipe or remaining on the wiped surface, lessens the number of unwanted organisms on the wiped surface. One known group of disinfectant materials are cationic, quaternary ammonium salts such as, for example, dimethyl benzyl ammonium chloride and dimethyl ethylbenzyl ammonium chloride.

[0004] It has been noted that cellulose containing wipe materials do not fully release all of the components of the lotion saturated therein. Cationic compounds in the lotion are especially retained by cellulose containing wipe materials. This has become particularly a problem with disinfectant wipes, as manufacturers are required to add more than a desired amount of disinfectant material to ensure a sufficient amount of disinfectant material is released to the wiped surface. Overadding such disinfectant material adds cost and may raise environmental and health and safety issues. Wet wipes consisting of 100% synthetic materials such as polyester or polyolefins do not retain cationic materials, however, such wet wipes have different, and typically less desirable, performance characteristics as compared to a wet wipe comprising cellulose materials. Wet wipes consisting of 100% synthetic materials, such as polyester and polyolefins, are not encompassed by the present invention.

[0005] Definitions

[0006] Bicomponent fibers or filaments—Fibers or filaments that have been formed by extruding polymer sources from separate extruders and spun together to form a single fiber or filament. Typically, two separate polymers are extruded, although a bicomponent fiber or filament encompasses extrusion of the same polymeric material from separate extruders. The extruded polymers are arranged in substantially constantly positioned distinct zones across the cross-section of the bicomponent fibers or filaments and extend substantially continuously along the length of the bicomponent fibers or filaments. The shape of these bicomponent fibers or filaments can be any which is convenient to the producer for the intended end use, e.g., round, trilobal, triangular, dog-boned, flat or hollow. The configuration of bicomponent fibers or filaments can be symmetric (e.g., sheath/core or side-by-side) or they can be asymmetric (e.g., offset core within sheath; crescent/moon configuration within a fiber having an overall round shape).

[0007] Cellulose material—Manmade (e.g. regenerated cellulose or lyocell and non-manmade (e.g. from natural sources such as woody and non-woody plants) material. Woody plants include, for example, deciduous and coniferous trees. Non-woody plants include, for example, cotton, flax, esparto grass, sisal, abaca, milkweed, straw, jute, hemp, and bagasse. Cellulose material includes fiber, pulp and other forms.

[0008] Cross machine direction (CD)—The direction perpendicular to the machine direction.

[0009] Denier—A unit used to indicate the fineness of a filament given by the weight in grams for 9,000 meters of filament. A filament of 1 denier has a mass of 1 gram for 9,000 meters of length.

[0010] Fiber—A material form characterized by an extremely high ratio of length to diameter.

[0011] Filament—A continuous fiber.

[0012] Lyocell—Manmade cellulose material obtained by the direct dissolution of cellulose in an organic solvent without the formation of an intermediate compound and subsequent extrusion of the solution of cellulose and organic solvent into a coagulating bath.

[0013] Machine direction (MD)—The direction of travel of the forming surface onto which fibers are deposited during formation of a nonwoven web material.

[0014] Non-thermoplastic material—Any material which does not fall within the definition of thermoplastic material.

[0015] Nonwoven fabric, sheet or web—A material having a structure of individual fibers which are interlaid, but not in an identifiable manner as in a knitted fabric. Nonwoven materials have been formed from many processes such as, for example, meltblowing, spunbonding, water laying, air laying and carding processes. The basis weight of nonwoven fabrics is usually expressed in grams per square meter (gsm) and the fiber fineness is measured in denier.

[0016] Polymer—Generally includes, for example, homopolymers, copolymers, such as for example, block, graft, random and alternating copolymers, terpolymers, etc, and blends and modifications thereof. Furthermore, unless otherwise specifically limited, the term "polymer" includes all possible geometrical configurations. These configurations include, for example, isotactic, syndiotactic and random symmetries.

[0017] Regenerated cellulose—Manmade cellulose obtained by chemical treatment of natural cellulose to form a soluble chemical derivative or intermediate compound and subsequent decomposition of the derivative to regenerate the cellulose. Regenerated cellulose includes spun rayon and regenerated cellulose processes include the viscose process, the cuprammonium process and saponification of cellulose acetate.

[0018] Spunbond nonwoven fabrics—Fabrics formed (usually) in a single process by extruding at least one molten thermoplastic material as filaments from a plurality of fine, usually circular, capillaries of a spinneret. The filaments are partly quenched and then drawn out to reduce fiber denier and increase molecular orientation within the fiber. The filaments are generally continuous and not tacky when they are deposited onto a collecting surface as a fibrous batt. The fibrous batt is then bonded by, for example, thermal bonding, chemical binders, mechanical needling, hydraulic entanglement or combinations thereof, to produce a nonwoven fabric.

[0019] Staple fiber—A fiber that has been formed at, or cut to, staple lengths of generally one quarter to eight inches (0.6 to 20.3 cm).

[0020] Tex—A unit used to indicate the fineness of a filament given by the weight in grams for 1,000 meters of filament. A filament of 1 tex has a mass of 1 gram for 1,000 meters of length.

[0021] Thermoplastic material—A polymer that is fusible, softening when exposed to heat and returning generally to its unsoftened state when cooled to room temperature. Thermoplastic material includes, for example, polyvinyl chloride, some polyesters, polyamide, polyfluorocarbon, polyolefin, some polyurethanes, polystyrene, polyvinyl alcohol, caprolactam, copolymers of ethylene and at least one vinyl monomer (e.g., poly (ethylene vinyl acetate), and acrylic resin.

SUMMARY OF THE INVENTION

[0022] One aspect of the invention comprises method for increasing the release of a cationic component of a chemical lotion from a nonwoven wet wipe material and the wet wipe comprising cellulose material produced therefrom. This method comprises adding a chemical blocking material to nonwoven fabric prior to saturation of the fabric with the lotion. The chemical blocking material is believed to interact with the cellulose material comprising the nonwoven web to prevent chemical bonding of cationic lotion components during subsequent impregnation and storage of the wet wipe.

[0023] In general, the compositions of the invention may be alternately formulated to comprise, consist of, or consist essentially of, any appropriate components herein disclosed. The compositions of the invention may additionally, or alternatively, be formulated so as to be devoid, or substantially free, of any components, materials, ingredients, adjuvants or species used in the prior art compositions or that are otherwise not necessary to the achievement of the function and/or objectives of the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0024] The nonwoven material useful in the present invention comprises about 20% to about 100% percent by weight of at least one cellulose material. The cellulose material can be selected from substantially any class of natural and manmade cellulose materials and blends thereof.

[0025] The nonwoven material in some variations of the invention may comprise cellulose pulp. The pulp component can be selected from substantially any class of pulp and blends thereof. In one advantageous variation the pulp is characterized by being entirely natural cellulose fibers and can include cotton as well as wood fibers, although softwood paper making pulp, such as spruce, hemlock, cedar and pine are typically employed. In another advantageous variation, wood pulp comprises about 40% to about 100% of the nonwoven material weight. Hardwood pulp and non-wood pulp, such as hemp and sisal may also be used. The selection and processing parameters necessary to achieve desired processed pulp characteristics and nonwoven web product performance are within the ordinary skill in the art.

[0026] The nonwoven material in some variations of the invention may comprise long vegetable fibers and particularly the extremely long, natural, unbeaten fibers such as manila hemp, caroa, flax, jute and Indian hemp. These very long natural fibers supplement the strength characteristics provided by other papermaking materials and, at the same time, provide a limited degree of bulk and absorbency coupled with a natural toughness and burst strength. Accordingly, the manila hemp or comparable fibers may be included in varying amounts.

[0027] The nonwoven material in some variations of the invention may comprise manmade cellulose material such as rayon fiber, lyocell fiber or combinations thereof. Advantageously, manmade cellulose material comprises about 0% to about 40% by weight of the nonwoven web material. The manmade cellulose material may be comprised of staple length fibers. Advantageously, the manmade cellulose material is comprised of fibers having a length of about 4 mm to about 12 mm and a fineness of about 1.0 denier to about 6.0 denier. As will be appreciated, longer fibers may be used where desired so long as they can be readily dispersed within the aqueous slurry of the other fibers.

[0028] The nonwoven material in some variations of the invention may comprise synthetic material such as, for example, polyolefin. Advantageously, synthetic material comprises about 0% to about 60% of the nonwoven web material. The synthetic material may be comprised of synthetic pulp or staple length fibers. The synthetic fibers typically have a length of about 4 mm to about 20 mm and a fineness of about 1.0 denier to about 18.0 denier, although other fiber lengths and/or deniers may also be useful in the invention.

[0029] The nonwoven material in some variations of the invention may comprise bicomponent fibers or filaments. Advantageously, bicomponent fibers or filaments comprise about 0% to about 20% of the nonwoven web material. The bicomponent fibers typically have a length of about 0.6 mm to about 20.0 mm and a fineness of about 1.5 denier to about 9.0 denier, although other bicomponent fiber lengths and/or deniers may also be useful in the invention. The bicomponent fibers may comprise polymers of, for example, polyethylene (PE), polypropylene (PP), and polyethylene terephthalate (PET) in any combination. PE/PP, PE/PET, and PET/PET are preferred polymer combinations for the bicomponent fibers, especially when configured as a higher melting point core and a lower melting point sheath. Celbond T-105, a 12.7 mm by 3 denier PE/polyester bicomponent fiber available from Kosa of Spartanburg S.C. is an example of one bicomponent fiber found useful in the invention.

[0030] The nonwoven fabric useful in the present invention may be prepared by, for example, fluid laying, air laying, carding or combinations thereof such as spunlacing. The fluid laying process involves the general steps of forming a fluid dispersion of the requisite material, depositing the dispersed material on a forming surface in the form of a continuous sheet-like mat and drying the mat to form a web material. The dispersion may be formed in a conventional manner to provide a furnish comprising water, cellulose material and optionally other fibers and/or pulp. The total concentration of cellulose material and fibers in the furnish will be a function of the equipment used, desired equipment processing parameters and desired resulting nonwoven material properties.

[0031] As will be appreciated, other known papermaking aids and treatments can be incorporated into the invention. For example, dispersing agents or wet strength agents may be incorporated into the furnish. These materials constitute only a minor portion of the furnish, typically less than one percent by weight, and facilitate uniform fiber deposition while providing the web in its wet condition with sufficient strength for subsequent handling. These agents may include natural materials, such as guar gum, karaya gum and the like as well as man-made resin additives.

[0032] Although substantially all commercial paper making machines may be used, it is desirable where very dilute fiber furnishes are employed to use an inclined fiber-collecting wire. In such machines the fibers flowing from the headbox are retained on the wire in a random three-dimensional network or configuration with slight orientation in the machine direction while the aqueous dispersant quickly passes through the wire and is rapidly and effectively removed. The wet mat is dried in a conventional manner, for example over heated drying cans or in an oven to form the nonwoven material, which is accumulated. The drying process may be controlled to achieve a desired level of fusion of synthetic fibers.

[0033] In the air laying process fibers are dispersed in air and the air suspension of fibers is drawn to a forming surface. Fibers are retained on the forming surface to form a nonwoven web material that is accumulated. In the carding process fibers are processed through a machine comprising sets of cards to form a nonwoven web material. The nonwoven fabric useful in the present invention may also be prepared by entangling cellulose material into, for example, a spunbond web material of thermoplastic filaments. Entanglement of the cellulose material can be achieved by, for example, hydroentanglement. The nonwoven fabric useful in the present invention includes multi phase materials prepared by successively wet laying subsequent furnishes over the first laid down furnish and, multi layer web materials.

[0034] The nonwoven fabric useful in the present invention may be hydroentangled. Hydroentanglement treatment entangles together the fibers forming the web material. Hydroentanglement is advantageous for developing a desirable cloth-like structure, for improving bulk of the resulting nonwoven material, for increasing tensile strength of the resulting nonwoven material and, in some cases, for improving fluid absorption characteristics of the resulting nonwoven material. Typically, the hydroentangling operation is carried out in the manner set forth in U.S. Pat. No. 5,009,747 to Viazmensky et al, the disclosure of which is incorporated by reference herein. While the Viazmensky patent relates to a nonwoven web material having a different fiber content, the hydroentangling operation described therein can efficaciously be employed with the present web material. The entanglement process can be carried out on the forming wire and advantageously using total energy input of about 0.01 to about 0.20 horsepower-hours per pound of web (Hp-hr/lb). It should be understood that energy inputs greater than 0.20 Hp-hr/lb can be used in the practice of the invention. Preferably, hydroentanglement is performed while the mat is still somewhat wet and prior to a final drying operation so that the resulting web material will have desired wet strength characteristics without significantly hampering or detracting from the high absorbency characteristics imparted to the web by the hydroentangling operation.

[0035] Some embodiments of the inventive web material include the addition of one or more chemical binders to increase strength of the nonwoven substrate. Suitable materials for use as a binder include, for example, acrylics, SBRs, and ethylene vinyl acetates latexes. The binder can be added at any convenient time, for example in the furnish or after production of the nonwoven web, for example by using a size press.

[0036] One aspect of the invention comprises a method of increasing the release of cationic components from a lotion solution saturated into the nonwoven wet wipe material. This method comprises adding a chemical blocking material to a nonwoven material prior to saturation of the lotion solution into the nonwoven material. The chemical blocking material unexpectedly reduces the amount of cationic lotion component retained on the wet wipe saturated with the lotion solution. Without wishing to be held to any theory, the chemical blocking material is believed to interact with the cellulose material in the web to prevent chemical bonding of cationic lotion components during saturation and storage of the wet wipe. Advantageous chemical blocking materials useful in this aspect of the invention include, for example, polyamide-epichlorohydrin resin; polyamide resin; melamine resin; high molecular weight cationic chemical material such as fabric softener or other quaternary compounds. An example of a polyamide-epichlorohydrin resin useful in the invention is a cationic, water soluble, thermosetting reaction product of epichlorohydrin and polyamide sold under the tradename KYMENE by Hercules Chemical Company.

[0037] The chemical blocking material used must not deleteriously affect the properties such as, for example, absorption capacity, wet strength and "feel" that are desirable for use in a wet wipe application. The polyamide-epichlorohydrin resin is advantageously used in this respect as a chemical blocking material in the present invention.

High molecular weight cationic materials such as fabric softeners may undesirably lessen the strength of wet laid nonwoven materials.

[0038] The amount of chemical blocking material added must be sufficient to lessen chemical bonding of cationic lotion components with cellulose material of the nonwoven web, but must not be so great as to deleteriously affect nonwoven sheet properties that are desirable for use in a wet wipe application. The polyamide-epichlorohydrin resin is advantageously used in amounts ranging from about 1.0% to about 5.0% or more based on weight of cellulose material in the nonwoven web. Preferably, the polyamide-epichlorohydrin resin is used in amounts ranging from about 1.5% to about 5.0% or more based on weight of cellulose material in the nonwoven web. It should be noted that the ultimate amount of chemical blocking material used will be based on the composition of the nonwoven web material as well as on factors such as cost and desired wet wipe properties such as cationic lotion component release, stiffness and feel.

[0039] The chemical blocking material is preferably added during furnish preparation in wet laid nonwoven materials. Addition of some chemical blocking materials, for example polyamide-epichlorohydrin resin, during furnish preparation at amounts greater than about 2% may lead to processing problems during wet laying of the furnish. It is believed that addition of a chemical blocking material to a wet laid nonwoven material in amounts greater than 2% may be more efficaciously carried out using a spray application or a size press application. The chemical blocking material can be added to air laid or carded nonwoven sheet via a size press or spray application.

[0040] The ability of a nonwoven sheet to absorb and hold liquids is an important property for wipes. The expression "absorptive capacity" as used herein refers to the capacity of the material to absorb liquid (i.e., water or aqueous solution) over a period of time and is related to the total amount of liquid absorbed and held by a material at its point of saturation. The total absorptive capacity is generally determined by measuring the increase in the weight of the sample material resulting from the absorption of a liquid. More particularly, to test for absorptive capacity, a 3 inch by 3 inch sample is preweighed and saturated by soaking in water for 60 seconds. The saturated sample is suspended by one corner within a 1,500 ml covered beaker containing 200 ml of water. The sample is allowed to hang suspended for 10 minutes. After hanging for 10 minutes the saturated sample is weighed. Absorptive capacity is calculated using the following formula:

$$(\text{wet weight} - \text{dry weight})/\text{dry weight} \times 100 = \text{Absorptive Capacity } (\%)$$

[0041] Disposable wet wipes of the type described in the application will typically have an absorptive capacity of at least 300 percent, with most webs having an absorptive capacity of about 500 percent and more.

[0042] Cationic component release can be evaluated by the following procedure. The concentration of cationic component in a test solution is measured using an appropriate known analytical technique. A fixed amount of a test solution (3.5 grams of liquid/gram of nonwoven material) having a known concentration of a cationic component is poured onto the nonwoven material and allowed to equilibrate for a predetermined period of time (e.g 24 hours, 1 week, 1 month). After the equilibration period, the test solution is squeezed and collected from the nonwoven material. The concentration of cationic component is measured in the expressed test solution. The amount of cationic component in the test solution minus the amount of cationic component in the expressed solution is equal to the amount of cationic component retained on nonwoven material.

[0043] The following example is present to illustrate the invention so that it maybe more fully understood. This example is not intended to limit in any way the practice of the invention. Unless otherwise specified, all parts are given by weight.

EXAMPLE 1

[0044] A series of nonwoven substrates were produced on a pilot paper forming machine at different levels of polyamide epichlorohydrin addition. Samples were formed using a fiber furnish composed of 20% 8 mm×1.5 denier viscose rayon fiber, 10% Celbond T-105 ½"×3.0 denier bicomponent fiber, 5% 10 mm×1.5 dpf polyester fiber and a blend of 65% wood pulp that consisted of 66% Irving northern softwood and 33% Brunswick Southern Pine.

[0045] The polyamide epichlorohydrin additive (Kymene LX) available from Hercules Chemical Co. was added to the furnish while in the pulper. Addition rates were controlled to yield samples containing 0%, 0.4%, 0.8%, 1.2%, 1.8% and 2.4% active Kymene LX based on weight of the cellulose portion of the furnish (both rayon and wood pulp).

[0046] The furnish was laid on a paper forming machine samples having a speed of 75 fpm to provide substrate samples having an ultimate basis weight of 47 gm/m^2. The wet substrates were water jet entangled using two injectors, containing nozzle strips having 51 holes/inch, with the orifice diameter at 92 microns. The nozzle pressures were set at 400 and 450 psi. The settings provided an entanglement energy input of about 0.0331 HP-hr/lb. The substrate samples were then dried on rotary steam drying cans with a maximum temperature of 300 degrees Fahrenheit to provide wiping substrates comprising different amounts of polyamide epichlorohydrin.

[0047] The wiping substrates were cut to provide samples and each sample was saturated with a solution containing BZK (a blend of Dimethyl Benzl Ammonium Chloride and Dimethyl Ethylbenzyl Ammonium Chloride) having a concentration of 0.29% of cationic, quaternary ammonium salts. After 5 days of equilibrating solution was expressed from the saturated wipe and tested to determine how much quaternary compound remained in solution and how much was retained by the cellulose.

[0048] Affect of Kymene Addition on Quaternary Compound Retention

% Kymene on wgt Cellulose	0.0%	0.4%	0.8%	1.2%	1.8%	2.4%
% BZK Retained in Wipe	31%	26.5%	22.4%	18.5%	14%	12.5%

[0049] While not wishing to be bound to any theory the inventors believe, based on the results of EXAMPLE 1, that the addition of polyamide-epichlorohydrin resin interacts with the cellulose portion of the wipe preventing chemical bonding of the cationic lotion components thereto providing increased release of the cationic lotion components. The other chemical blocking materials are believed to function in a similar manner.

PROPHETIC EXAMPLE 1

[0050] A two phase wiping material can be prepared by dispersing about 20% polypropylene fibers, about 20% polyester fibers, about 60% wood pulp and about 2% polyamide-epichlorohydrin resin (based on weight of the pulp) in water to form a furnish. The prepared furnish can be divided into two portions. The first furnish portion can be provided through the headbox and onto the forming fabric of an inclined fourdrinier papermaking machine. The second furnish portion can be provided through a second headbox displaced downstream from the first headbox and onto the previously laid first furnish to form a two phase wet mat. The wet mat can be supported on the forming fabric and passed under water jet entanglement nozzles during the entanglement operation. The entangled wet mat can then be dried on steam heated rotary drying cans as is known. The 2% addition of polyamide-epichlorohydrin resin interacts with the cellulose wood pulp and prevents chemical bonding of cationic lotion components thereto, providing increased release of the cationic lotion components.

[0051] As will be appreciated to persons skilled in the art, various modifications, adaptations, and variations of the foregoing specific disclosure can be made without departing from the teachings and spirit of the present invention.

What is claimed is:

1. A method for increasing release of a cationic lotion component from a wet wipe, comprising the steps of forming a single ply web material comprising cellulosic fibers; treating the fibers of the web material with a solution of a chemical blocking material to provide in the web material about 2.1% to about 5% (by dry weight of cellulosic fibers) of the chemical blocking material; and treating the web material with a chemical lotion containing the cationic lotion component after the step of treating the fibers.

2. The method of claim 1 wherein the solution of chemical blocking material is applied to the fibers after the web material is formed.

3. The method of claim 1 wherein the solution of chemical blocking material is applied to the fibers before the web material is formed.

4. The method of claim 1, wherein the web material comprises about 20% to about 100% cellulose.

5. The method of claim 1, wherein the chemical blocking material comprises a polyamide-epichlorohydrin resin; a polyamide resin; a melamine resin; a high molecular weight cationic chemical material or combinations thereof.

6. The method of claim 1, wherein the chemical blocking material comprises about 2.1% to about 2.5% (by dry weight of cellulose fibers) in the nonwoven sheet.

7. The method of claim 1, wherein the web material comprises a wet laid, air laid or carded portion.

8. The method of claim 1, wherein the step of forming the web material comprises air laying the cellulosic fibers; and the step of treating the fibers comprises adding the chemical blocking material to the web material using a size press or a spray application, wherein the chemical blocking material comprises at least one of a polyamide-epichlorohydrin resin; a polyamide resin; a melamine resin; or a high molecular weight cationic chemical compound.

9. The method of claim 1, wherein the step of forming the web material comprises carding the cellulosic fibers; and the step of treating the fibers comprises adding the chemical blocking material to the web material using a size press or a spray application, wherein the chemical blocking material comprises at least one of a polyamide-epichlorohydrin resin; a polyamide resin; a melamine resin; or a high molecular weight cationic chemical compound.

10. The method of claim 1, wherein the step of forming the web material comprises preparing a furnish of the cellulosic fibers in a fluid and wet laying the furnish over a forming surface; and the step of treating the fibers comprises adding the chemical blocking material to at least one of the furnish or the formed web material, wherein the chemical blocking material comprises at least one of a polyamide-epichlorohydrin resin; a polyamide resin; a melamine resin; or a high molecular weight cationic chemical compound.

11. The method of claim 1, wherein the web material further comprises at least one of synthetic material or bicomponent fibers.

12. A method of decreasing cationic lotion component binding to cellulose material in a wet wipe sheet, comprising:

preparing a furnish comprising cellulose material in a fluid;

wet laying the furnish over a forming surface to form a mat; and

drying the mat to form a single ply sheet;

adding about 2.1% to about 5% (by weight of cellulose material) of a chemical blocking material to at least one of the furnish, the mat or the sheet; and

soaking the sheet with a chemical lotion including the cationic lotion component after the step of adding the chemical blocking material to form a wipe;

wherein the wipe comprising about 2.1% to about 5% of chemical blocking material retains about 10% less of cationic lotion component as compared to a wipe comprised of similar materials without the chemical blocking material.

13. The method of claim 12 wherein the furnish further comprises at least one of synthetic material or bicomponent fibers.

14. The method of claim 12 wherein the chemical blocking material comprises at least one of a polyamide-epichlorohydrin resin; a polyamide resin; a melamine resin; or a high molecular weight cationic chemical compound.

15. The method of claim 12 wherein the chemical blocking material consists essentially of a polyamide-epichlorohydrin resin.

16. The method of claim 12, comprising the step of hydroentangling the mat prior to the step of drying.

17. A disinfectant wet wipe, comprising a single ply nonwoven fibrous sheet comprising about 20% to about 100% cellulose material; about 2.1% to about 5% (by dry weight of cellulose material) of a chemical blocking material; and a chemical lotion comprising a disinfectant material including at least one of dimethyl benzyl ammonium chloride or dimethyl ethylbenzyl ammonium chloride; wherein the chemical blocking material lessens retention of the disinfectant material to the nonwoven sheet.

18. The wet wipe of claim 17 wherein the chemical blocking material is a polyamide-epichlorohydrin resin.

19. The disinfectant wet wipe of claim 17 comprising about 2.1% to about 2.5% (by dry weight of cellulose material) of the chemical blocking material.

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