

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Haggquist	
Application No.: 11/801,647	Art Unit: 1776
Filed: 05/09/2007	Examiner: Greene, Jason M
Title: Active Particle-Enhanced Membrane and Method for Making and using the Same	
Attorney Docket No.: 6000.108.01US (TT-8)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ARGUMENTS SUBMITTED WITH THE FILING OF A REQUEST FOR CONTINUED
EXAMINATION

Dear Sir,

In response to the Office Action of July 16, 2012, please accept the included request for continued examination:

A listing of the claims begins on page 2 of this response.

Remarks begin on page 15 of this response.

The following listing of claims replaces all prior versions and previously submitted listing of claims in this application:

1. (Previously Presented) A water-proof breathable membrane comprising:
 - a substantially liquid-impermeable cured base material solution;
 - a plurality of active particles in contact with the substantially liquid-impermeable cured base material solution, wherein the plurality of active particles are capable of improving the transmission of vapor through the substantially liquid-impermeable cured base material solution;
 - at least one removable encapsulant in an amount effective to prevent at least a substantial portion of the plurality of active particles from being deactivated prior to removal of the removable encapsulant; wherein,
 - the at least one removable encapsulant is removable to reactivate at least a portion of the plurality of active particles to improve the transmission of vapor through the water-proof breathable membrane, and
 - the membrane comprises a moisture vapor transmission rate from about $600\text{g/m}^2/\text{day}$ to about $11000\text{g/m}^2/\text{day}$.
2. (cancelled) The membrane according to claim 1, wherein the base material exhibits water-proof properties when converted into a non-solution state, and the membrane is a water-proof breathable membrane.

3. (Original) The membrane according to claim 1, wherein the membrane possesses anti-static properties due at least in part to the active particles.
4. (Original) The membrane according to claim 1, wherein the membrane possesses stealth properties due at least in part to the active particles.
5. (Original) The membrane according to claim 1, wherein the membrane possesses odor adsorbance properties due at least in part to the active particles.
6. (Original) The membrane according to claim 1, wherein the membrane possesses quick drying properties due at least in part to the active particles.
7. (Original) The membrane according to claim 1, wherein the base material solution is selected from the group consisting of: a polyurethane solution, a polyacrylic solution, 1,3 propanediol terephthalate solutions, and any suitable combination thereof.
8. (Original) The membrane according to claim 1, wherein the active particles comprise activated carbon.
9. (Original) The membrane according to claim 1, wherein the active particles comprise zeolites.

10. (Original) The membrane according to claim 1, wherein the active particles are selected from the group consisting of: antibacterial, antiviral, antimicrobial, antifungal particles, and any suitable combination thereof.

11. (Original) The membrane according to claim 1, wherein the active particles are selected from the group consisting of: activated carbon, aluminum oxide (activated alumina), silica gel, soda ash, aluminum trihydrate, baking soda, p-methoxy-2-ethoxyethyl ester cinnamic acid (cinoxate), zinc oxide, zeolites, titanium dioxide, molecular filter-type materials, and any suitable combination thereof.

12. (previously presented) The membrane according to claim 1, wherein the at least one removable encapsulant is selected from the group consisting of: water-soluble surfactants, surfactants, salts, photo-reactive materials, degradable materials, bio-degradable materials, ethoxylated acetylenic diols, starches, lubricants, glycols, corn starch, mineral spirits, organic solvents, paraffinic solvents, and any suitable combination thereof.

13. (previously presented) The membrane according to claim 1, wherein the active particles comprise about 0% to about 75% of the total weight of the membrane.

14. (previously presented) The membrane according to claim 1, wherein the active particles comprise about 30% to about 50% of the total weight of the membrane.

15. (previously presented) The membrane according to claim 1, wherein the active particles comprise about 0% to about 30% of the total weight of the membrane.
16. (previously presented) The membrane according to claim 1, wherein the active particles comprise about 0% to about 50% of the total weight of the membrane.
17. (previously presented) The membrane according to claim 1, wherein the membrane comprises a yarn or fabric.
18. (previously presented) The membrane according to claim 1, wherein the membrane comprises a plastic material.
19. (previously presented) The membrane according to claim 1, wherein the membrane comprises an article of clothing.
20. (previously presented) The membrane according to claim 1, wherein the membrane comprises a fabric.
21. (previously presented) The membrane according to claim 1, wherein the membrane comprises a coated fabric.
22. (Original) The membrane according to claim 1, wherein the membrane is coated on to ePTFE.

23. (previously presented) The membrane according to claim 1, wherein the membrane comprises a coated article of clothing.
24. (Original) The membrane according to claim 1, wherein the membrane comprises a non-woven membrane.
25. (previously presented) The membrane according to claim 1, wherein the membrane comprises a laminate.
26. (Original) The membrane according to claim 1, wherein the membrane is selected from the group consisting of bags, foam, plastic components, upholstery, carpeting, rugs, mats, sheets, towels, rugs, pet beds, mattress pads, mattresses, curtains, filters, shoes, insoles, diapers, shirts, pants, blouses, undergarments, protective suits, and any suitable combination thereof.
27. (Original) The membrane according to claim 1, wherein the removable encapsulant is a first removable encapsulant, and the membrane further comprises a second removable encapsulant.
28. (previously presented) A water-proof composition comprising:
a liquid-impermeable breathable cured base material;
a plurality of active particles in contact with the liquid-impermeable breathable cured base material; and wherein,

the active particles improve the moisture vapor transport capacity of the composition, and

a moisture vapor transmission rate of the water-proof composition comprises from about 600g/m²/day to about 11000g/m²/day.

29. (previously presented) The composition of claim 28, wherein the active particles comprise about 0% to about 75% of the total weight of the composition.

30. (previously presented) The composition of claim 28, wherein the active particles comprise about 30% to about 50% of the total weight of the composition.

31. (previously presented) The composition of claim 28, wherein the active particles comprise about 0% to about 30% of the total weight of the composition.

32. (previously presented) The composition of claim 28, wherein the active particles comprise about 25% to about 75% of the total weight of the composition.

33. (previously presented) The composition of claim 28, wherein the active particles comprise about 0% to about 50% of the total weight of the composition.

34. (cancelled) The composition of claim 28, wherein the base material exhibits water-proof properties when converted into a non-solution state.

35. (Original) The composition of claim 28, wherein the composition possesses anti-static properties at least in part due to the active particles.
36. (Original) The composition of claim 28, wherein the composition possesses stealth properties at least in part due to the active particles.
37. (Original) The composition of claim 28, wherein the composition possesses odor adsorbance properties at least in part due to the active particles.
38. (Original) The composition of claim 28, wherein the composition possesses quick drying properties at least in part due to the active particles.
39. (Original) The composition of claim 28, wherein the active particles are selected from the group consisting of: activated carbon, aluminum oxide (activated alumina), silica gel, soda ash, aluminum trihydrate, baking soda, p-methoxy-2-ethoxyethyl ester cinnamic acid (cinoxate), zinc oxide, zeolites, titanium dioxide, molecular filter-type materials, and any suitable combination thereof.
40. (Original) The composition of claim 28 further comprising: at least one removable encapsulant in an amount effective to prevent at least a substantial portion of the active particles from being deactivated prior to removal of the removable encapsulant, and wherein the removable encapsulant is removable to reactivate at least a portion of the active particles to improve the moisture vapor transport capacity of the composition.

41. (previously presented) The composition of claim 40, wherein the at least one removable encapsulant is selected from the group consisting of: water-soluble surfactants, surfactants, salts, polymer salts, polyvinyl alcohols, waxes, photo-reactive materials, degradable materials, bio-degradable materials, ethoxylated acetylenic diols, starches, lubricants, glycols, corn starch, mineral spirits, organic solvents, paraffinic solvents, and any suitable combination thereof.
42. (Withdrawn) A method for producing a breathable membrane, the method comprising:
- encapsulating a plurality of active particles with at least one removable encapsulant to produce encapsulated active particles;
 - mixing the encapsulated particles with a base material solution to obtain a mixture solution; and
 - converting the mixture solution into non-solution form to produce the breathable membrane, wherein breathable properties of the membrane are due at least in part to the mixing of the active particles.
43. (Withdrawn) The method of claim 42, wherein the base material solution further exhibits water-proof properties when converted into non-solution form.
44. (Withdrawn) The method of claim 42, wherein the membrane possesses anti-static properties due at least in part to the mixing of the active particles.
45. (Withdrawn) The method of claim 42, wherein the membrane possesses quick drying properties due at least in part to the mixing of the active particles.

46. (Withdrawn) The method of claim 42, wherein the membrane possesses odor adsorbance properties due at least in part to the mixing of the active particles.
47. (Withdrawn) The method of claim 42, wherein the membrane possesses stealth properties due at least in part to the mixing of the active particles.
48. (Withdrawn) The method of claim 42, wherein the encapsulating and the mixing are performed in a single step.
49. (Withdrawn) The method of claim 42, further comprising removing at least a portion of the encapsulant from the encapsulated active particles.
50. (Withdrawn) The method of claim 49, wherein the removing comprises dissolving the encapsulant.
51. (Withdrawn) The method of claim 49, wherein the removing comprises evaporating the encapsulant.
52. (Withdrawn) The method of claim 49, wherein the encapsulant deactivates the active particles and the removing comprises reactivating the active particles.

53. (Withdrawn) The method of claim 42, wherein the base material solution is selected from the group consisting of: a polyurethane solution, a polyacrylic solution, 1,3 propanediol terephthalate solutions, and any suitable combination thereof.
54. (Withdrawn) The method of claim 42, wherein the active particles comprise activated carbon.
55. (Withdrawn) The method of claim 42, wherein the active particles comprise zeolites.
56. (Withdrawn) The method of claim 42, wherein the active particles are selected from the group consisting of: antibacterial, antiviral, antimicrobial, antifungal particles, and any suitable combination thereof.
57. (Withdrawn) The method of claim 42, wherein the active particles are selected from the group consisting of: activated carbon, aluminum oxide (activated alumina), silica gel, soda ash, aluminum trihydrate, baking soda, p-methoxy-2-ethoxyethyl ester cinnamic acid (cinoxate), zinc oxide, zeolites, titanium dioxide, molecular filter-type materials, and any suitable combination thereof.
58. (Withdrawn) The method of claim 42, wherein the at least one removable encapsulant is selected from the group consisting of: water-soluble surfactants, surfactants, salts (*e.g.*, sodium chloride, calcium chloride), polymer salts, polyvinyl alcohols, waxes, photo-reactive materials, degradable materials, biodegradable materials, ethoxylated acetylenic diols, starches, lubricants,

glycols, corn starch, mineral spirits, organic solvents, paraffinic solvents, and any suitable combination thereof.

59. (Withdrawn) The method of claim 42, wherein the active particles comprise about 0% to about 75% of the membrane.

60. (Withdrawn) The method of claim 42, wherein the active particles comprise about 30% to about 50% of the membrane.

61. (Withdrawn) The method of claim 42, wherein the active particles comprise about 0% to about 30% of the membrane.

62. (Withdrawn) The method of claim 42, wherein the encapsulating comprises:
encapsulating the active particles with a first removable encapsulant; and
encapsulating the active particles with a second removable encapsulant.

63. (previously presented) A water-proof composition comprising:
a base material;
a plurality of active particles in contact with the base material; and wherein,
the active particles improve the, vapor transport and anti-static
properties of the composition, and
a moisture vapor transmission rate of the water-proof composition
comprises from about 600g/m²/day to about 11000g/m²/day.

64. (Original) The composition of claim 63, wherein the active particles comprise activated carbon.

65. (Original) The composition of claim 63, wherein the active particles comprise zeolites.

66. (previously presented) The composition of claim 63, wherein the active particles comprise about 30% to about 50% of the total weight of the composition.

67. (previously presented) The composition of claim 63, wherein the active particles comprise about 0% to about 30% of the total weight of the composition.

68. (previously presented) A water-proof composition comprising:
a base material;
a plurality of active particles in contact with the base material; and wherein,
the active particles improve the vapor transport and stealth properties of
the composition, and
a moisture vapor transmission rate of the water-proof composition
comprises from about 600g/m²/day to about 11000g/m²/day.

69. (Original) The composition of claim 68, wherein the active particles comprise activated carbon.

70. (Original) The composition of claim 68, wherein the active particles comprise zeolites.

71. (previously presented) The composition of claim 68, wherein the active particles comprise about 30% to about 50% of the total weight of the composition.

72. (previously presented) The composition of claim 68, wherein the active particles comprise about 0% to about 30% of the total weight of the composition.

73. (previously presented) The membrane of claim 1, wherein, the substantially liquid-impermeable cured base material solution, plurality of active particles, and at least one removable encapsulant comprise a mixture, the mixture being adapted for application to a substrate prior to the substantially liquid-impermeable cured base material solution being cured

REMARKS

Reconsideration and further examination is respectfully requested. Claims 1, 3-33, 35-41 and 63-73 are currently pending in the application. Claims 2 and 34 were previously cancelled and claims 42-62 were previously withdrawn.

Claim rejections under 35 USC § 102

The Examiner has rejected Claims 28, 29, 31, 33, 35-39, 63, 64, 67-69 and 72 under 35 USC 102(b) as being anticipated by U.S. Pat. No. 6,028,019 (hereinafter, Spijkers). Applicant submits that the Spijkers reference fails to disclose each and every limitation of the claims. Therefore, Applicant respectfully requests removal of the Section 102 rejection of claims 28, 29, 31, 33, 35-39, 63, 64, 67-69 and 72. For example, the Examiner is incorrect in stating that “Spijkers et al. discloses... a plurality of active particles (activated carbon) in contact with the liquid impermeable breathable cured base material....” In fact, Spijkers fails to disclose that the carbon soot disclosed therein is an active particle. The only reference to “activated carbon” in Spijkers is within the “Description of Related Art” section in describing “DE-A1-40003765.” However, the membrane disclosed in Spijkers only contains “carbon particles” and “soot.” See Col. 1, lines 55-60. Since the Spijkers reference fails to disclose the use of activated carbon in a waterproof membrane, each of claims 28, 29, 31, 33, 35-39, 63, 64, 67-69 and 72 are in a condition for allowance and Applicant respectfully requests removal of the Section 102 rejection of these claims.

Claim rejections under 35 USC § 103

Claims 30, 32, 66, and 71 have been rejected under 35 USC 103(a) as being unpatentable over Spijkers. Applicant hereby incorporates the arguments made above with respect to the Section 102 rejection and applies those arguments to the rejection of claims 30, 32, 66, and 71.

Furthermore Applicant submits that Spijkers fails to disclose or allude, expressly or inherently that the carbon soot particles may be activated carbon particles. As such, claims 30, 32, 6, and 71 are in a condition for allowance and Applicant respectfully requests removal of the Section 103 rejection of claims 30, 32, 66, and 71.

Claims 1, 3-27, 40, 41, 65 and 70 have been rejected under 35 USC § 103(a) as being unpatentable over Spijkers in view of U.S. Pat. App. Pub. No. 2004/0018359 (“Haggquist”).

Applicant hereby incorporates the arguments made above with respect to the Section 102 rejection and applies those arguments to the rejection of claims, 3-27, 40, 41, 65 and 70.

Applicant further submits that neither Spijkers nor Haggquist, together or individually, expressly or inherently disclose or allude to a membrane comprising a moisture vapor transmission rate of about 600g/m²/day to about 11000 g/m²/day. For example, Haggquist fails to even mention the term “membrane.” Furthermore, the activated carbon disclosed in Haggquist operates very differently than the carbon soot particles disclosed in Spijkers. Additionally, the carbon soot particle disclosed in Spijkers comprises an “average size of 5 to 40 nm.” This soot is extremely small in comparison to the Spijkers disclosed membrane “thickness of 5-50 μm”. Col 5, lines 36-37. Applicant submits that such a small carbon particle size would leave the particles buried deep within the polymer and therefore the particles would not be exposed at the polymer surface. Therefore, even if the unactivated carbon soot of the Spijkers reference were replaced with the activated carbon from the Haggquist reference, the activated carbon would also be buried in the polymer and not exposed at the polymer surface. Since the active surface of the particles would be buried, the active particles would become inactivated and therefore, the membranes would not be enhanced by the particles. Also, larger active particles would not work properly with the small membrane size of Spijkers because the larger active particles would poke holes in the

membrane. Such holes would create leaks and diminish the waterproof features of any such membrane. As such, neither Spijkers nor Haggquist, together or individually, expressly or inherently disclose or allude to a membrane comprising a moisture vapor transmission rate of about 600g/m²/day to about 11000 g/m²/day. Applicant therefore requests removal of the Section 103 rejection of claims 1, 3-27, 40, 41, 65 and 70.

Applicants have made a diligent effort to place the claims in condition for allowance. Furthermore, failure of Applicants to respond to any specific rejection by the Examiner does not comprise an implicit acceptance of the Examiner's rejection. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Shane Percival, Applicants' Attorney at 720-536-4900 so that such issues may be resolved as expeditiously as possible.

For these reasons, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

/Shane Percival/

December 17, 2012

Date

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