

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Haggquist	
Application No.: 11/801,647	Art Unit: 1772
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

RESPONSE TO OFFICE ACTION

Dear Sir,

In response to the Office Action of February 1, 2013, please amend this application as follows:

Amendments to the claims are reflected in a list of claim which begins on page 2 of this response.

Remarks begin on page 16 of this response.

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

1. (Currently amended) A water-proof breathable membrane comprising:
 - a substantially liquid-impermeable cured base material solution comprising a first thickness;
 - 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, and
 - comprise a second thickness, wherein the first thickness is less than an order of magnitude larger than the second thickness;
 - 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)

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. (currently amended) A water-proof composition comprising:
a liquid-impermeable breathable cured base material comprising a first thickness;
a plurality of active particles in contact with the liquid-impermeable breathable cured base material, the plurality of active particles comprising a second thickness; and wherein,

the first thickness is less than an order of magnitude larger than the second thickness.

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 $600\text{g/m}^2/\text{day}$ to about $11000\text{g/m}^2/\text{day}$.

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)

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, biodegradable 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 comprising a first thickness;
a plurality of active particles in contact with the base material, the plurality of
active particles comprising a second thickness; and wherein,
the first thickness is less than an order of magnitude larger than the second
thickness.

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. (currently amended) A water-proof composition comprising:

a base material comprising a first thickness;

a plurality of active particles in contact with the base material, the plurality of active particles comprising a second thickness; and wherein,

the first thickness is less than an order of magnitude larger than the second thickness,

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.

74. (new) The membrane of claim 1 wherein,
the first thickness comprises a thickness of about 1 mil; and

the second thickness comprises a thickness of about 10 microns.

75. (new) The composition of claim 28 wherein,

the first thickness comprises a thickness of about 1 mil; and

the second thickness comprises a thickness of about 10 microns.

76. (new) The composition of claim 63 wherein,

the first thickness comprises a thickness of about 1 mil; and

the second thickness comprises a thickness of about 10 microns.

77. (new) The composition of claim 68 wherein,

the first thickness comprises a thickness of about 1 mil; and

the second thickness comprises a thickness of about 10 microns.

78. (new) The membrane of claim 1 wherein, the first thickness is at least as large as the second thickness.

79. (new) The composition of claim 28 wherein, the first thickness is at least as large as the second thickness.

80. (new) The composition of claim 63 wherein, the first thickness is at least as large as the second thickness.

81. (new) The composition of claim 68 wherein, the first thickness is at least as large as the second thickness.

REMARKS

Claims 1, 3-33, 35-41, and 63-81 and pending. Claims 2 and 34 were previously cancelled. Claims 42-62 have been withdrawn. Claims 1, 28, 63, and 68 are amended herein in order to more particularly point out the scope of the claims. Claims 74-81 have been added. Applicant submits that all cancellations and amendments are made without prejudice to pursue additional claims in a subsequent application.

Claim Rejections under 35 USC § 103

The Examiner has rejected claims 1, 3-33, 35-41 and 63-73 under 35 U.S.C. 103(a) as being unpatentable over Spijkers et al. (U.S. 6,028,019) in view of Haggquist (U.S. 2004/0018359). Although Applicant is under the impression that previously presented claims 1, 3-33, 35-41 and 63-73 were in a condition for allowance, in order to further prosecution, Applicant has amended independent claims 1, 28, 63 and 68 to include the claim features that the cured base material solution comprises a first thickness and the plurality of active particles comprises a second thickness, with the first thickness being less than an order of magnitude larger than the second thickness. Support for these claim amendments may be found at, for example, Paragraph 0049, which states that the Example 1 membrane comprises a thickness of about 1mil, or about 25.4 microns (the first thickness) and Paragraph 0050, which states that the activated carbon used in such a membrane comprises Asbury5564™ powdered coconut activated carbon. As seen in the attached Product Data Sheet for Asbury 5564™ powdered coconut activated carbon, the particle size for the Asbury 5564™ powdered coconut activated carbon comprises about 10 microns (the second thickness). Therefore, the first thickness is less than an order of magnitude larger than the second thickness.

Applicant submits that neither Spijkers nor Haggquist, together or individually, disclose or allude to a membrane having a first thickness and an active particle having a second thickness with the first thickness being less than an order of magnitude larger than the second thickness. In fact, Spijkers teaches away from such a membrane. As seen in the title and elsewhere, Spijkers discloses a use of a carbon soot *pigment* in order to change the optical presentation of the membrane. In order to appropriately pigment a membrane, Spijkers discloses using “carbon particles with an average size of about 5 to 40 nm,” as seen on Col. 1, lines 58-59 (and elsewhere) in a membrane having a thickness of about 5-50 microns (as agreed to by the Examiner in Response to Arguments). Although Haggquist discloses a larger active particle size of less than 10 microns (Paragraph 0085), neither Haggquist nor Spijkers discloses or alludes to using an active particle in a membrane where the membrane comprises a thickness that is less than an order of magnitude larger than the active particles. The Spijkers reference discloses the use of a *much thicker* membrane than the incorporated particles and the Haggquist reference discloses an active particle having a size which is an order of magnitude greater than the particle size disclosed in Spijkers. As such, Applicant submits that a person of ordinary skill in the art would not introduce the Haggquist particles into the Spijkers membrane. Even if the Haggquist particles were to be used in the Spijkers membrane, based on the Spijkers reference which discloses the use of a *much thicker* membrane than the incorporated particles, Applicant submits that a Spijkers membrane having an order of magnitude thickness greater than the Haggquist particles would be used with the Haggquist particles. Since neither Spijkers nor Haggquist, together or individually, disclose or allude to a membrane having a first thickness and an active particle having a second thickness with the first thickness being less than an order of magnitude larger than the second thickness, Applicant submits that each of claims 1, 28, 63, and

68 are in a condition for allowance and Applicant respectfully requests removal of the Section 103 rejection of these claims. Furthermore, since each of claims 3-27, 29-33, 35-41, 64-67, and 69-73 are dependent on claims 1, 28, 63, and 68, respectively, claims 3-27, 29-33, 35-41, 64-67, and 69-73 are likewise in a condition for allowance and Applicant respectfully requests removal of the Section 103 rejection of each of these claims as well.

Notwithstanding the substantive arguments presented above, the examiner has not performed the required analysis to support a rejection under 35 USC 103(a). In order to support such a rejection, the examiner must give a clear articulation of the reasons why the claimed invention would have been obvious. The United States Supreme Court in *KSR v. Teleflex* noted that the analysis supporting a rejection under 35 USC 103 should be made **explicit**. “Rejections on obviousness cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR v. Teleflex*, 550 U.S. 398 (2007), See Slip Opinion at 14. In this case, none of the available rationales for supporting an obviousness finding have been met by the examiner; rather, mere conclusory statements about what is contained in the prior art, and that it would have been obvious to combine those elements in order to create some general benefit, is all that can be found in the Examiner’s reasons for rejection under 35 USC 103. For example, the Examiner states that “one of ordinary skill in the art would have recognized that the removable encapsulant could be sued [sic] for such a purpose [to prevent premature deactivation] in the Spijkers et al membrane.” This cannot support an obviousness determination under KSR or the PTO guidelines for rejections under Section 103. For example:

1. The Examiner has not resolved (nor even mentioned) any of the Graham factual inquiries, a necessary pre-requisite to a finding based on obviousness;

2. The Examiner has not indicated that a combination of old elements from the prior art would function as it did separately;

3. The Examiner has not indicated that one of skill in the art would have recognized that the results of the combination were predictable;

4. The Examiner has not indicated that one of skill in the art could have substituted one known element for another, and the results of the substitution would have been predictable;

5. The Examiner has not indicated that the prior art contained a base device upon which the claimed invention can be seen as an improvement;

6. The Examiner has not indicated that the prior art contained a comparable device that is not the same as the base device that was improved in the same way as the claimed invention.

7. The Examiner has not indicated the one of skill in the art could have applied the known improvement technique in the same way to the base device and the results would have been predictable to one of skill in the art;

8. The Examiner has not indicated that one of skill in the art would have recognized that applying a known technique would have yielded predictable results and resulted in an improved system.

9. The Examiner has not indicated that there was market forces or design incentives which would have prompted adaptation of the known device;

10. The Examiner has not indicated that the differences between the claimed invention and the prior art were encompassed in known variations or in a principle known in the prior art;

11. The Examiner has not indicated that one of skill in the art, in view of the identified design incentives or other market forces, could have implemented the claimed variation of the prior art, and the claimed variation would have been predictable to one of skill in the art; and

12. Overall, the Examiner has not, under the Graham factual inquiries, presented any findings that would otherwise explain the conclusion of obviousness.

Because none of these required factual inquiries have been presented, the examiner has not presented a prima facie argument as to why claims 1, 3-33, 35-41, and 63-73 would be obvious in light of the prior art references. The rejections should be withdrawn on this basis as well.

New Claims

New claims 74-77 include the claim features that the first thickness comprises a thickness of about 1 mil and the second thickness comprises a thickness of about 74 microns. As stated above with reference to independent claims 1, 28, 63, and 68, support for these features may be found at Paragraph 0049 of the specification, and Paragraph 0050, along with the attached specification sheet for Asbury 5564™ powdered coconut activated carbon. Applicant submits that neither Spijkers nor Haggquist, together or individually, disclose or allude to such thickness and as such, claims 74-77 are in a condition for allowance.

New claims 78-81 include the claim feature that the composition comprises a first thickness that is at least as large as the second thickness. Applicant hereby incorporates the argument made above with respect to claim 1 and submits that since one first thickness is disclosed as about 25.4 microns in the specification and one second thickness is disclosed as about 10 microns in the specification, the claim feature that the first thickness is at least as large

as the second thickness is supported by the specification. Furthermore, Applicant submits that neither Spijkers nor Haggquist, together or individually, disclose or allude to the use of such relative membrane and active particle thickness in a membrane and as such, claims 78-81 are in a condition for allowance.

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, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

June 4, 2013

/Shane Percival/

Date

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