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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DARRELL H. RENEKER and DANIEL J. SMITH

Appeal 2019-005818
Application 13/737,050
Technology Center 1700

Before CATHERINE Q. TIMM, JEFFREY T. SMITH, and
DONNA M. PRAISS, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 4–8, 23–29, 31–37, and 39–43. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as University of Akron. (Appeal Br. 2.)

STATEMENT OF THE CASE

Appellant's invention generally relates to absorbent materials comprising at least one hydrophilic elastomeric fibrous component (HEFC), comprising an elastomeric polymer and a hydrophilic polymer, and at least one absorbent component. The absorbent component is in fluid communication with the HEFC due to physical proximity to one another. (Spec ¶ 2.) Claim 1 illustrates the subject matter on appeal and is reproduced below:

1. A liquid entrapping device comprising:
an absorbent component; and
a hydrophilic elastomeric fibrous component, wherein the hydrophilic elastomeric fibrous component is a single material that is both liquid absorbent and liquid wicking, wherein the absorbent component and the hydrophilic elastomeric fibrous component are in physical proximity thereby resulting in fluid communication,
wherein the absorbent component is more absorbent than the hydrophilic elastomeric fibrous component but wherein the hydrophilic elastomeric fibrous component absorbs more quickly than and has a smaller holding capacity than the absorbent component therefore resulting in a net fluid flow from the hydrophilic elastomeric fibrous component to the absorbent component,
wherein the absorbent component is mechanically entangled by the hydrophilic elastomeric fibrous component, and wherein the liquid entrapping device is capable of absorbing from 400% to 6000% when placed in water and from 500% to 1250% when placed in synthetic urine (by weight);
wherein the absorbent component is selected from polyesters, polyethers, polyester-polyethers, polymers having pendant carboxylic acids or pendant hydroxyls, polysiloxanes, polyacrylamides, kaolins, serpentines, smectites, glauconite, chlorites, vermiculites, attapulgite, sepiolite, allophane and imogolite, sodium polyacrylates, 2-propenamide-co-2-propenoic acid, and any combination thereof; and

wherein the hydrophilic elastomeric fibrous component is selected from zein protein, polyester elastomers, polydimethylsiloxane, hydrophilic poly(ether-co-ester) elastomers, silicone-co-polyethyleneglycol elastomers, polyacrylates, thermoplastic polyurethanes, poly(ether-co-urethanes), and any combination thereof.

Appeal Br. 30–31, Claims Appendix (additional paragraphing added).

The following rejections are presented for our review²:

I. Claims 1, 4–8, 26–29, 31–37, and 39–43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell (US 2002/0017354 A1, published Feb. 14, 2002) in view of Doi (WO 00/47802, published Aug. 17, 2000, with US 6,403,216 cited as the English equivalent).

II. Claims 1, 4–8, 26–29, 31–37, and 39–43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell in view of McDowall (US 6,362,389 B1, issued Mar. 26, 2002).³

III. Claims 23–25 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell, Doi, and Ågren (US 4,685,907, issued Aug. 11, 1987).

² The complete statement of the rejections on appeal appears in the Final Office Action. (Final Act. 2–24.)

³ The statement of the rejection appearing in the Final Office Action includes the Rohrbaugh reference. This appears to be an inadvertent error on the part of the Examiner because the discussion of the rejection does not include Rohrbaugh. The Examiner excluded the Rohrbaugh reference when reproducing the rejection in the Answer. (*See* Ans. 11–19.)

IV. Claims 23–25 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell, McDowall, and Ågren.

V. Claims 27, 37, and 39–43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell, Doi, and Lucast (US 6,198,016 B1, issued Mar. 6, 2001).

VI. Claims 27, 37, and 39–43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell, McDowall, and Lucast.

VII. Claims 28, 35–37, and 39–43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell, Doi, and Rohrbaugh (US2002/0151634 A1, published Oct. 17, 2002).

VIII. Claims 28, 35–37, and 39–43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Riddell, McDowall, and Rohrbaugh.

OPINION

Rejections I and II

The Examiner rejected claims 1, 4–8, 26–29, 31–37, and 39–43 under 35 U.S.C. § 103(a) over the combination of Riddell and Doi (Rejection I) and Riddell and McDowall (Rejection II).

After review of the respective positions Appellant and the Examiner provide, we determine that Appellant has demonstrated reversible error in the Examiner’s rejections under 35 U.S.C. § 103(a). We limit our discussion to independent claim 1.⁴

⁴ Our analysis also applies to independent claims 29 and 37.

The dispositive issue for this rejection is:

Did the Examiner reversibly err in determining that Riddell in combination with either Doi or McDowall teaches or suggests a liquid entrapping device comprising (i) at least one absorbent component and (ii) at least one hydrophilic elastomeric fibrous component that comprises an elastomeric polymer and a hydrophilic polymer, wherein the absorbent component and the hydrophilic elastomeric fibrous component are in physical proximity thereby resulting in fluid communication as required by independent claims 1, 29, and 37?⁵

The Examiner finds Riddell teaches meltblown webs having absorbent particles (clay or superabsorbent particles) substantially uniformly and homogeneously dispersed therethrough wherein the particles are maintained in the web by mechanical entanglement with the fibers. (Final Act. 2.) The Examiner finds Riddell teaches that the fibers may comprise thermoplastic elastomers such as polyurethanes and the absorbent component is selected from at least polyacrylamides and polyacrylates. (Final Act. 2; Riddell ¶¶ 45, 48–50.) The Examiner finds

Riddell does not appear to specifically teach that the polyurethane elastic fibers are hydrophilic, liquid absorbent and liquid wicking, and that the absorbent component or superabsorbent component is more absorbent than the fibrous component but the fibrous component absorbs more quickly than and has a smaller holding capacity than the absorbent component.

(Final Act. 3.)

⁵ We limit our discussion to the combination of Riddell together with either Doi or McDowall. The Examiner cited additional references to address the features of the dependent claims. The discussion of the dispositive issue does not require consideration of the additionally cited references.

Addressing these distinctions, the Examiner cites Doi and McDowall. (Final Act. 3–4, 11–12.) The Examiner finds Doi teaches a moisture absorbing/releasing synthetic fiber and fabric, wherein representative examples of the synthetic fibers include polyurethane synthetic fiber and polyether synthetic fiber. (Final Act. 4.) The Examiner finds McDowall teaches thermoplastic elastomeric fibers including block elastomeric copolymers and polyurethanes wherein the thermoplastic elastomeric fibers may be made wettable by applying a hydrophilizing surface treatment to the fibers or by adding a hydrophilic ingredient to the polymer prior to spinning. (Final Act. 11).

Addressing the rejections over the combination of Riddell and Doi (Rejection I), the Examiner concludes it would have been obvious to form the absorbent nonwoven article of Riddell, wherein elastomeric polyurethane fibers of Riddell are substituted by the moisture-absorbing/releasing polyurethane fibers, such as taught by Doi, to obtain a conventional absorbent nonwoven article comprising elastomeric polyurethane fibers having high stretch recovery and high strength at break. (Final Act. 4.)

Addressing the rejections over the combination of Riddell and McDowall (Rejection II), the Examiner concludes it would have been obvious to form the absorbent nonwoven article of Riddell, wherein elastomeric polyurethane fibers of Riddell are substituted by the hydrophilized polyurethane obtained by polymerizing polyethylene oxide to the polyurethane, such as taught by McDowall, to obtain a conventional absorbent nonwoven article comprising elastomeric polyurethane fibers having the desired hydrophilicity and being

predictably suitable for similar applications, such as absorbent articles.

(Final Act. 12.)

Addressing the relationship between the absorbent/superabsorbent component and fibrous component, the Examiner states:

Riddell teaches that the absorbent component may comprise clays or superabsorbent particles (*see for example* Riddell, paragraphs 0048 and 0049). Additionally, Appellants' specification teaches that superabsorbents include organic polymers and porous clays (*see* Appellants' specification, paragraph 0039). Therefore, both Riddell and Appellants' specification appear to teach substantially similar or identical absorbent components.

(Final Act. 4.)⁶

Appellant argues Riddell in combination with either Doi or McDowall, fail to teach or suggest the liquid entrapping device of claim 1 that requires two different and separate components, specifically absorbent materials comprising (i) at least one absorbent component and (ii) at least one hydrophilic elastomeric fibrous component (HEFC), comprising an elastomeric polymer in a hydrophilic polymer, wherein the absorbent component and the hydrophilic elastomeric fibrous component are in physical proximity thereby resulting in fluid communication. (Appeal Br. 11–12, 20–21.) Appellant argues Riddell in combination with either Doi or McDowall, fail to teach or suggest the two separate components with liquid communication therebetween and having the wicking and net flow properties required by independent claim 1. (Appeal Br. 14–15, 23.)

Addressing Appellant's argument regarding the fluid communication/transportation between subcomponents, the Examiner states:

⁶ *See also* Final Act. 14.

Since the prior art combination establishes meltblown webs suitable for use in diapers, hygiene products and body dressings, having absorbent particles substantially uniformly and homogeneously dispersed therethrough wherein the particles are maintained in the web by mechanical entanglement with the fibers, the fibers and particles necessarily suggest fluid communication/transportation between components. It is unclear how the particles would be capable of absorbing fluid once fluid is applied to the web, without the fibers and particles which are entangled together being in fluid communication with each other.

(Ans. 29, 36.)

The Examiner has focused on the absorbent particles, e.g., clay, that are incorporated into the meltblown fibers. (Final Act. 4; Riddell ¶¶ 48, 49.) Riddell discloses the absorbent particles are incorporated/penetrated into the skin of the meltblown fibers resulting in the substantial elimination of dusting. (Riddell ¶ 33.) As is apparent from the Examiner's response to Appellant's argument, the Examiner has not accounted for all the limitations of the claimed invention. The claimed invention requires the combination of (i) at least one absorbent component and (ii) at least one hydrophilic elastomeric fibrous component (HEFC) that is both liquid absorbent and liquid wicking. The claimed invention specifies the HEFC comprise both an elastomeric polymer and a hydrophilic polymer. The claimed invention specifies the absorbent component (i) and the HEFC (ii) are in physical proximity thereby resulting in fluid communication between the two subcomponents. The Examiner's rejections failed to adequately explain how the combination of Riddell and either Doi or McDowall account for the properties of the claimed liquid entrapping device that comprises (i) HEFC that is both liquid absorbent and liquid wicking and (ii) an absorbent component that is more absorbent than the HEFC.

Consequently, the Examiner has failed to adequately explain how the combination of Riddell and either Doi or McDowall renders obvious the limitations of independent claims 1, 29, and 37.

Accordingly, we do not sustain the Examiner’s 35 U.S.C. § 103 rejections of all the claims on appeal that rely on Riddell together with either Doi or McDowall or in combination with additional references. The additional references fail to cure the deficiency discussed above.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 4–8, 26–29, 31–37, 39–43	103(a)	Riddell, Doi		1, 4–8, 26–29, 31–37, 39–43
1, 4–8, 26–29, 31–37, 39–43	103(a)	Riddell, McDowall		1, 4–8, 26–29, 31–37, 39–43
23–25	103(a)	Riddell, Doi, Ågren		23–25
23–25	103(a)	Riddell, McDowall, Ågren		23–25
27, 37, 39–43	103(a)	Riddell, Doi, Lucast		27, 37, 39–43
27, 37, 39–43	103(a)	Riddell, McDowall, Lucast		27, 37, 39–43
28, 35–37, 39–43	103(a)	Riddell, Doi, Rohrbaugh		28, 35–37, 39–43
28, 35–37, 39–43	103(a)	Riddell, McDowall, Rohrbaugh		28, 35–37, 39–43
Overall Outcome				1, 4–8, 23–29,

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Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
				31-37, 39-43

REVERSED