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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MICHAEL DONOVAN, THOMAS W. BEIHOFFER, NATALIA V. LARIONOVA, and MAREK R. MOSIEWICZ

Appeal 2015-001038
Application 13/077,871
Technology Center 1700

Before PETER F. KRATZ, ROMULO H. DELMENDO, and JEFFREY R. SNAY, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

The Applicants (hereinafter the "Appellants")[1] appeal under 35 U.S.C. § 134(a) from a final decision of the Primary Examiner to reject claims 1, 3–5, 7, 8, 10, 12–15, 17–22, 24, 26–28, and 30–44.[2, 3] We have jurisdiction under 35 U.S.C. § 6(b).

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[1] The Appellants state that the real party in interest is "AMCOL International Corporation" (Appeal Brief filed July 21, 2014, hereinafter "Appeal Br.," 2).

[2] Appeal Br. 6–7; Final Office Action delivered electronically on March 13, 2014, hereinafter "Final Act.," 7–32.

[3] The Appellants identify a related appeal in Application "11/942,628" [sic, 11/942,638] (Appeal Br. 2) from which the current application claims continuation-in-part status (Specification, hereinafter "Spec.," ¶ 1). That

We affirm-in-part.

BACKGROUND

The subject matter on appeal relates to: (i) a geocomposite article for waterproofing a surface against the penetration of high conductivity salt-containing water; (ii) a method of manufacturing such an article; and (iii) a method of waterproofing a surface (Spec. ¶ 2, Abst.). The Appellants explain the basis for their invention as follows (*id.* ¶ 8):

> Surprisingly it has been found that a partially cross-linked copolymer of acrylamide/partially neutralized polyacrylic acid, preferably acrylamide/potassium acrylate or sodium acrylate/acrylic acid copolymer (CAS# 312-12-13-2), e.g., STOCKOSORB, or STOCKOSORB S, from Evonik Stockhausen, Inc. of Greensboro, NC, will waterproof surfaces against the penetration of high conductivity water.

According to the Appellants (*id.* ¶ 17), articles including the specified copolymer "have exceptional and unexpected free swell when in contact with high conductivity water or multivalent ion-containing-contaminated water."

Representative claim 1 is reproduced from page 20 of the Appeal Brief (Claims Appendix), with key limitations highlighted in italicized text, as follows:

> 1. A self-healing geocomposite article comprising:
> a) a pair of adjacent and coextensive woven or non-woven geotextile fabrics needle-punched together containing a powdered or granular self-healing copolymer particle layer contained therein, at an interface thereof, or sandwiching the self-healing layer therebetween;
> b) the self-healing layer comprising *a partially cross-linked, water-insoluble powdered or granular high conductivity*

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appeal (2015-001052) is also assigned to us and is being decided concurrently.

- water absorbent copolymer particles, having 50 wt.% to 90 wt.% of the particles in the 200μm to 800μm size range, and about 10 wt.% to about 50 wt.% having a size of 50μm to 200μm, and capable of absorbing water having a conductivity of at least 1mS/cm, said copolymer containing about 25-80 mole % acrylamide; about 15-40 mole % sodium or potassium or lithium or ammonium acrylate; and about 5-20 mole % acrylic acid;

wherein the geocomposite article exhibits a self-healing performance index less than 0.1 when tested by placing a 1 inch slit through all layers of the geocomposite article sealed at its edges under 4 meters of water with a conductivity of 1 mS/cm or greater, and

wherein said geocomposite article, further includes a water-impermeable membrane layer adhered to and essentially coextensive with an outer major surface of one of the geotextile fabrics.

The other independent claims on appeal—namely, claims 19, 28, 38, 39, and 41—recite the same or similar disputed limitations (Appeal Br. 22–24, 25–27).

THE REJECTIONS

The Examiner rejected the claims as follows:

I. Claim 4 under 35 U.S.C. § 112, second paragraph, as indefinite;

II. Claims 1, 3, 5, 7, 10, 18–21, 27, 28, 30, and 38–44 under 35 U.S.C. § 103(a) as unpatentable over Alexander,[4] as evidenced by *U.S. Fish & Wildlife Service: Don*

[4] US 5,132,021, issued July 21, 1992.

Edwards San Francisco Bay,[5] in view of White[6] and Farrar et al. (hereinafter "Farrar"),[7] as evidenced by Kimura et al. (hereinafter "Kimura"),[8] Shalaby et al. (hereinafter "Shalaby"),[9] and *Components and Salinity of Seawater*;[10]

III. Claim 4 under 35 U.S.C. § 103(a) as unpatentable over the same references applied in Rejection II and further in view of Darlington, Jr. et al.[11];

IV. Claims 8, 17, and 26 under 35 U.S.C. § 103(a) as unpatentable over the same references applied in Rejection II and further in view of Levy;[12]

V. Claims 12–14, 33, and 34 under 35 U.S.C. § 103(a) as unpatentable over the same references applied in Rejection II and further in view of Zhou et al.[13];

VI. Claims 15, 22, and 24 under 35 U.S.C. § 103(a) as unpatentable over the same references applied in

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[5] *U.S. Fish & Wildlife Service: Don Edwards San Francisco Bay*, http://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/habitat.html (first publication date unknown).
[6] US 5,237,945, issued August 24, 1993.
[7] US 5,171,781, issued December 15, 1992.
[8] EP 0 450 924 A2, published October 9, 1991.
[9] US 2006/0286143 A1, published December 21, 2006.
[10] *Components and Salinity of Seawater*, http://drake.marin.k12.ca.us/stuwork/rockwater/the%20salt%20in%20seawater/saltinseawaterpg3.html (last visited Nov. 9, 2010).
[11] US 6,852,813 B2, issued February 8, 2005.
[12] US 5,679,364, issued October 21, 1997.
[13] US 6,737,472 B2, issued May 18, 2004.

Rejection II and further in view of Hardin et al.[14];

VII. Claims 31, 32, and 37 under 35 U.S.C. § 103(a) as unpatentable over the same references applied in Rejection II and further in view of Stark;[15]

VIII. Claims 35 and 36 under 35 U.S.C. § 103(a) as unpatentable over the same references applied in Rejection II and further in view of Olsta et al.[16]; and

IX. Claims 1, 3–5, 7, 8, 10, 12–15, 17–22, 24, 26–28, and 30–41 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 4–6, 8–11, 13–24, and 26–43[17] of copending Application 11/942,638.

(Examiner's Answer delivered electronically on September 19, 2014, hereinafter "Ans.," 2; Final Act. 2–32.)

DISCUSSION

Rejections I & IX

The Appellants do not contest Rejections I and IX with any substantive arguments, but instead state that they will amend claim 4 and file a terminal disclaimer upon indication of allowable subject matter to overcome these rejections, respectively (Appeal Br. 13, 15). Because no amendment and/or terminal disclaimer has been filed, we summarily affirm Rejections I and IX.

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[14] US 6,802,672 B2, issued October 12, 2004.
[15] US 5,501,753, issued March 26, 1996.
[16] US 2005/0103707 A1, published May 19, 2005.
[17] Claim 26 in Application 11/942,638 has been canceled (Application 11/942,638, Amendment filed December 19, 2013).

Rejections II–VIII

The Examiner interprets the recitation "having 50 wt.% to 90 wt.% of the particles in the 200μm to 800μm size range, and about 10 wt.% to about 50 wt.% [of the particles] having a size of 50μm to 200μm" in claim 1 to read on a copolymer in which 100% of the particles are 200 μm in size (Final Act. 9). The Examiner then determines that the combined teachings of Alexander and White would have disclosed or suggested an article as recited in the Appellants' claim 1, except that it would contain bentonite clay and White's superabsorbent polyacrylate polymer, rather than the Appellants' specified water-absorbent copolymer containing specified molar amounts of acrylamide, sodium or potassium or lithium or ammonium acrylate, and acrylic acid (*id.* at 10–13). The Examiner further finds that Farrar "discloses water absorbent particulate polymers which may be swellable and insoluble[,]" including a polymer made from "5 to 100 mole % acrylic acid with 0 to 95 mole % acrylamide and optionally 0 to 50 mole% other non-ionic or anionic monomer" and that Kimura teaches that "water-absorbent copolymer resin powders can be surface treated to particularly exhibit absorption in high ionic conductivity water, such as sea water" (*id.* at 13). In addition, the Examiner finds that Shalaby "discloses known superabsorbing polymers of crosslinked poly(acrylic acid-co-acrylamide), potassium salt, are available as granules having sizes 200-1,000 μm" (*id.* at 13–14).

Based on these findings, the Examiner concludes (*id.* at 14):

> [I]t would have been obvious to one of ordinary skill in the art . . . to use the particulate water-absorbent resin as taught by Farrar as the polyacrylate superabsorbent polymer as disclosed by modified Alexander motivated by expected success of providing a water-absorbent layer.

Additionally, the Examiner determines that "one of ordinary skill in the art . . . would have been motivated to arrive at the claimed particle size since Shalaby discloses that superabsorbing polymers of crosslinked poly(acrylic acid-co-acrylamide), potassium salt, are available as granules having sizes 200-1,000 μm" (*id.*). According to the Examiner (*id.*), "CAS # 31212-13-2 has the chemical name Poly (acrylic acid-co-acrylamide), Potassium Salt."

Regarding the "self-healing performance index less than 0.1" limitation recited in claim 1, the Examiner finds that "the geocomposite article as taught by *modified* Alexander would also exhibit a self-healing performance index less than 0.1" (emphasis added) and that the burden was shifted to the Appellants to provide evidence to the contrary (*id.* at 14–15).

The Appellants point out that "[a]ll three monomers [recited in claim 1] are required as well as the particle size range, for sufficient swell in high-conductivity water to meet the claimed self-healing performance index" (Appeal Br. 8). According to the Appellants (*id.*), "[s]urprisingly, any slit in the water-impermeable membrane layer will self-heal by expansion of the copolymer upon absorption of the high conductivity water." With respect to the Examiner's inherency position, the Appellants argue that an article including bentonite, which is the same material disclosed in Alexander, exhibited a self-healing performance index (i.e., 1.15) that is significantly higher than "less than 0.1" as recited in claim 1 (*id.* at 9) (relying on "DECLARATION OF MICHAEL DONOVAN, PH.D" executed on January 4, 2012, hereinafter "First Donovan Declaration," ¶ 6). Furthermore, the Appellants argue that Shalaby does not teach "that all [copolymer] particles have a 200μm size" (*id.* at 10).

The Examiner responds that the First Donovan Declaration is unpersuasive because it refers to partially crosslinked copolymers described in prior art references (US 6,783,802 B2, iss. Aug. 31, 2004, and US 6,777,480, iss. Aug. 17, 2004) that are not relied upon in the rejection and that the mole percentages recited for the partially crosslinked copolymers based on these references are not representative of Farrar's disclosure (Ans. 5). In addition, the Examiner points out that the Declaration provided tests conducted with 3.5% salt water, whereas the claims (e.g., claim 5) recite 4.5% sea water (*id.* at 5–6). Furthermore, the Examiner finds that the showing is not commensurate in scope with the claims in terms of the amount of the water-absorbent copolymer in the self-healing layer (*id.* at 6).

We agree with the Appellants. Alexander discloses an article for holding and treating water contaminated with one or more water-soluble contaminants so as to substantially prevent the contaminants from seeping into ground water supplies disposed below a water hold area (Abst.). According to Alexander, the article includes a water-holding material such as a water-swellable clay (e.g., bentonite) for reducing the permeation of the contaminated water into the soil and a water-holding material containing a material for adsorbing, absorbing, ion-exchanging, neutralizing, or reaction with the one or more water-soluble contaminants (*id.*). Although Alexander teaches "cross-linked acrylic . . . copolymers" as ion-exchange materials, the ion-exchange materials are included for removing the water-soluble contaminants (col. 6, ll. 62–66; col. 8, ll. 24–34). Thus, in Alexander, a water-swellable clay such as bentonite is disclosed as the material that holds water or swells in the presence of water (col. 4, ll. 28–56; col. 5, ll. 39–53).

White discloses a water barrier fabric filled with a water-absorbent powdered or granular material (e.g., bentonite) (col. 3, ll. 9–30). White further teaches that the water-absorbent material may include "bentonite clay and/or a polyacrylate superabsorbent polymer" (col. 17, ll. 19–25).

Farrar discloses water absorbent particulate polymers, such as crosslinked anionic polymers made from 5–100 mole% acrylic acid (as free acid or salt) with 0–95 mole% acrylamide and optionally 0–50 mole% of other nonionic or anionic monomer (Abst.; col. 12, ll. 21–40). Farrar states that the polymers may be "swellable and insoluble" (Abst.).

Shalaby discloses that a crosslinked potassium salt of poly(acrylic acid-co-acrylamide) having a granular morphology of 200–1,000 μm "[a]bsorbs many times its weight of aqueous fluid" (Table, ¶ 6).

These teachings in Alexander, White, Farrar, and Shalaby are insufficient to support the Examiner's flawed inherency position. The closest prior art references—Alexander and White—both disclose water-swellable clay (e.g., bentonite) as the primary water-absorbent material. Although these references suggest the inclusion of other materials including acrylic resins, they do not disclose the specific water-absorbent copolymer recited in claim 1 and no specific findings are offered to establish that all acrylic resins as disclosed in these references would necessarily yield the characteristic recited in the claim. Contrary to the Examiner's stated position (Final Act. 14–15), the burden did not properly shift to the Appellants to show that Alexander, *when modified in view of the other references*, would inherently possess the self-healing performance index of 0.1 as specified in claim 1. That would impermissibly require the Appellants to compare the claimed invention against the claimed invention.

In re Tiffin, 443 F.2d 394, 399 (CCPA 1971) ("The examiner's composite process is appellants' process, and thus cannot be compared with it.").

Rather, the Appellants can effectively rebut a prima facie case of obviousness by comparing the claimed invention against the closest prior art. *In re Merchant*, 575 F.2d 865, 869 (CCPA 1978).

In our view, they did so here for claim 1. As noted above, the Appellants attribute the surprising results in terms of waterproofing surfaces against the penetration of high conductivity water to the use of the copolymer recited in the claim (Spec. ¶ 8). The First Donovan Declaration reasonably supports that assertion. Specifically, the Declaration demonstrates that a copolymer within the scope of claim 1 (or a combination thereof with bentonite) exhibited significantly improved self-healing performance index characteristics (tested with 3.5% salt water) compared to bentonite alone, which is representative of either Alexander or White, or bentonite in combination with partially crosslinked acrylic acid/neutralized acrylic acid (First Donovan Decl. ¶ 6).

We discern no merit in the Examiner's objections to the Declaration evidence. Although the First Donovan Declaration refers to other prior art documents (First Donovan Decl. ¶ 5), the described experiments include a fair comparison between the claimed invention and the applied closest prior art references (Alexander and White), both of which disclose bentonite as in the comparative experiment described in the Declaration (*id.* ¶ 6). In addition, although the Declaration states that the testing was performed using 3.5% salt water, as opposed to 4.5% salt water as recited in claim 5, the Examiner fails to explain why that difference would negate the surprising or unexpected results shown in the Declaration. Finally, the

Examiner's position that the showing is not commensurate in scope with the claims is not well-founded because, consistent with the Appellants' position (Reply Brief filed October 14, 2014 at 3), claim 1 limits the article to only those that exhibit the specified self-healing performance index of "less than 0.1" (Appeal Br. 20).

In addition to the Examiner's flawed inherency position, we cannot agree with the Examiner (Final Act. 9, 14) that Shalaby discloses (or would have suggested) 100% of the copolymer particles to be 200 μm in size. Shalaby merely discloses a granular morphology of 200–1,000 μm (¶ 6). That disclosure falls short of suggesting that all particles for a given polymer have uniform particle sizes (e.g., 200 μm). Moreover, the Examiner does not articulate a sufficient reason why a person having ordinary skill in the art would have undertaken the additional steps (if possible) to ensure 100% of the particles are 200 μm in size or to use copolymer particles having the size distributions specified in the claims.

For these reasons, we cannot uphold Rejections II–VIII.

SUMMARY

Rejections I and IX are affirmed. Rejections II–VIII are reversed.

Therefore, the Examiner's decision to reject the claims is affirmed as to claims 1, 3–5, 7, 8, 10, 12–15, 17–22, 24, 26–28, and 30–41, but reversed as to claims 42–44.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED-IN-PART