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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte THOMAS CHARLES CASTLE,
ROBERT LOUIS FINCH, DAVID ALAN PEARS,
MAURICE PRESTON, PENNADAM SHANMUGAM SIVANAND,
BRIAN DAVID YOUNG, and DEREK RONALD ILLSLEY

Appeal 2019-006177
Application 14/106,975
Technology Center 1700

Before MICHAEL P. COLAIANNI, GEORGE C. BEST, and
DEBRA L. DENNETT, *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 36–42, 44–46, 48–68, and 75–77 of Application 14/106,975. Advisory Act. 1 (January 22, 2019). We have jurisdiction under 35 U.S.C. § 6.

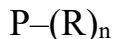
For the reasons set forth below, we *affirm*.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies Sun Chemical Corp., as the real party in interest. Appeal Br. 2.

I. BACKGROUND

The '975 Application describes functionalized homopolymers and copolymers of vinyl alcohol. Spec. ¶ 2. These polymers are said to comprise one or more aminosilane-containing and/or aminosilanol-containing side chains attached to the polymer backbone via a reactive coupling group. *Id.* The '975 Application describes a process for preparing such polymers and their use in coatings, inks, or adhesives. *Id.* Claim 36 is representative of the '975 Application's claims and is reproduced below from the Appeal Brief's Claims Appendix.

36. An ink or coating composition comprising a gel-free, functionalized homopolymer or copolymer of vinyl alcohol according to the formula:



where:

P comprises a straight or branched chain polymer backbone comprising a homopolymer or copolymer of vinyl alcohol and at least one other monomer, and reactive coupling groups comprising a ketone-containing or ketoester-containing functional group;

R comprises side chains attached to the polymer backbone via the reactive coupling groups that are aminosilane having one end amine functional group and/or aminosilanol having one end amine functional group; and

n is the number of side chains ranging from about 1 to about 25 mol% of the polymer backbone; and

clay comprising particles having at least one dimension that is less than 100 nm;

wherein a weight % ratio of the aminosilane to the keto-ester reactive coupled vinyl copolymer or homopolymer ranges from about 1:2 to 1:100.

Appeal Br. App. 7 (emphasis added).

II. REJECTIONS

On appeal, the Examiner maintains the following rejections:

1. Claims 36–42, 44, 48–58, 62–68, and 75–77 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Morinaka² and Kotani,³ as evidenced by Lavoie.⁴ Answer 3–5.
2. Claims 45 and 46 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Morinaka, Gerow,⁵ and Kotani, as evidenced by Lavoie. Answer 6.
3. Claims 59–61 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Morinaka, Farrell,⁶ and Kotani, as evidenced by Lavoie. Answer 6.

III. DISCUSSION

After entry of the Final Action, Appellant sought to amend the claims in the '975 Application. Amendment After Final (January 9, 2019). The proposed amendments to the claims were entered on January 22, 2019. Advisory Act. 1. In these amendments, Appellant, *inter alia*, amended claim 36 to incorporate the limitations recited in dependent claim 47. *Id.* at 2.

² JP 2003/171600, published June 20, 2003. We follow the Examiner and Appellant by referring to a machine translation that was made of record in this appeal on May 26, 2016.

³ US 5,700,560, issued Dec. 23, 1997.

⁴ US 5,494,961, issued Feb. 27, 1996.

⁵ US 3,595,740, issued July 27, 1971.

⁶ US 5,506,011, issued April 9, 1996.

Appellant argues for reversal of all of the rejections at issue based upon the limitations in amended claim 36. Appeal Br. 3–6; Reply Br. 2–3. We, therefore, select claim 36 as representative of the claims subject to this ground of rejection and limit our discussion to this claim. 37 C.F.R. § 41.37(c)(1)(iv).

A. Rejection of claims 36–42, 44, 48–58, 62–68, and 75–77 as unpatentable under § 103(a) over Morinaka and Kotani, as evidenced by Lavoie

In rejecting claim 36, the Examiner found that Morinaka’s coating composition, as modified by Lavoie, describes each component and feature of the claimed composition, except that Morinaka and Lavoie are silent regarding including clay in the composition. Answer 3–4. The Examiner, however, found that Kotani teaches adding clay of the requisite size to a vinyl alcohol polymer. *Id.* at 4 (citing Kotani Abstract; 6:18–36; 7:1–11).

The Examiner determined that it would have been obvious to a person having ordinary skill in the art at the time of invention to add Kotani’s clay to Morinaka’s polymer. Answer 4. According to the Examiner, the routineer would have been motivated to do so because Kotani suggests that introducing “clay into a polymer improves the gas barrier properties.” *Id.* (citing Kotani 1:23–41).

Appellant argues that the rejection of claim 1 should be reversed because the Examiner erred by finding that a person having ordinary skill in the art would have been motivated to combine Morinaka, as modified by Lavoie, with Kotani. Appeal Br. 4–5. In particular, Appellant argues that: (i) the Examiner’s relied upon passage from Kotani teaches “the advantage of providing packaging with gas barrier properties,” *id.* at 4 (citing Kotani 1:23–41), and (ii) there is no reason to combine modified Morinaka and

Kotani because Morinaka's composition already "provide[s] excellent gas barrier properties," Appeal Br. 4. Appellant argues that the Examiner's purported motivation to combine is based on providing a redundant advantage, which is impermissible hindsight reasoning. *Id.* (citing *Kinetic Concepts, Inc. v. Smith and Nephew, Inc.*, 688 F.3d 1342 (Fed. Cir. 2012)).

In response, the Examiner argues that, *inter alia*, Kotani's clay is not disclosed as providing "a redundant advantage to crosslinking with a silane [as] shown in Morinaka." Answer 7. Rather, the Examiner contends Kotani teaches that including clay in a resin composition comprising a crosslinked vinyl alcohol polymer having a good barrier gas property would have been "additionally advantageous." *Id.*

Appellant addresses the Examiner's argument in its Reply Brief by: (i) reiterating that the ordinarily skilled artisan "seeking to create a better gas barrier composition[] would have no reason to combine the features of" modified Morinaka and Kotani "into a single composition" and (ii) Kotani is distinguished as it merely describes improving a coating composition comprising a vinyl alcohol polymer in which the sidechain R is a silane, not the claimed aminosilane side chain. Reply Br. 2 (citing Kotani 7:45–67).

First, Kotani's disclosure supports the Examiner's position that including clay in a resin comprising a crosslinked vinyl alcohol polymer would have conferred improved gas barrier properties as compared to the same resin without clay. For example, Kotani explicitly discloses that "that a resin composition consisting of . . . a non-film-forming inorganic laminar compound can be given excellent gas barrier properties by increasing the aspect ratio of the non-film-forming inorganic laminar compound." Kotani 2:32–36. We note Kotani teaches that a "non-film-forming inorganic laminar compound having a large aspect ratio is preferably an inorganic laminar

compound which can be swollen or [cleaved] with a solvent.” *Id.* at 5:47–49. Kotani discloses that the particularly preferred inorganic laminar compounds are “non-film-forming *clay* minerals. *Id.* at 6:19–20 (emphasis added).

We further note that Kotani’s “Table 3 . . . indicates inferior gas barrier properties” (*id.* at 14:53–55) for resins comprising crosslinked polyvinyl alcohol polymers, which exclude an inorganic laminar compound, as compared to such resins comprising an inorganic laminar compound. *Id.* Table 3 (*compare* oxygen permeability values for Comparative Examples 14 and 15 of 63.06 and 32.82 cc/m²/day/atm, respectively, with the significantly decreased and desirable oxygen permeability values for Examples 21–25).

Kotani thus teaches that including clay in a coating composition comprising a crosslinked vinyl alcohol polymer would not have provided a redundant advantage for the same composition in the absence of clay.⁷ A person having ordinary skill in the art, therefore, would have combined modified Morinaka and Kotani for the reasons set forth by the Examiner.

Second, we are not persuaded that Kotani is distinguished for describing a coating composition comprising a vinyl alcohol polymer in which the sidechain R is a silane. *See* Reply Br. 2. In our view, one of ordinary skill in the art would have recognized that both Kotani and Morinaka similarly teach the beneficial use of a coating composition comprising vinyl alcohol polymer, regardless of whether the crosslinking agent used is silane or aminosilane. *See In re Fritch*, 972 F.2d 1260, 1264–65 (Fed. Cir. 1992) (a reference stands for all of the specific teachings

⁷ We, furthermore, agree with the Examiner that the additional advantages conferred by Kotani’s clay distinguish the instant case from our reviewing Court’s holding in *Kinetic Concepts*. *See* Answer 7.

thereof as well as the inferences one of ordinary skill in the art would have reasonably been expected to draw therefrom). Appellant, therefore, does not identify reversible error in the Examiner's determination that it would have been obvious to one of ordinary skill in the art at the time of the invention to have added Kotani's clay to Morinaka's polymer.

In view of the foregoing, we determine that the Examiner did not reversibly err in rejecting claim 36, as amended, as unpatentable over Morinaka with Kotani, as evidenced by Lavoie. Accordingly, we also affirm the rejection of claims 37–42, 44, 48–58, 62–68, and 75–77, which depend from claim 36.

B. Rejection of claims 45 and 46 as unpatentable under § 103(a) over Morinaka, Kotani, as evidenced by Lavoie, and Gerow

Appellant argues that the rejection of claims 45 and 46 as unpatentable over the combination of Morinaka, Kotani, as evidenced by Lavoie, and Gerow should be reversed for the reasons set forth in arguing for reversal of the rejection over the combination of Morinaka with Kotani, as evidenced by Lavoie. *See* Appeal Br. 6 (“Gerow does not cure the aforementioned deficiencies of the reference combination cited against claim 36.”).

For the reasons set forth above, we have affirmed the rejection of independent claim 36 as unpatentable over the combination of Morinaka, Kotani, as evidenced by Lavoie. We, therefore, also affirm the rejection of claims 45 and 46 as unpatentable over the combination of Morinaka, Kotani, as evidenced by Lavoie, and Gerow.

C. Rejection of claims 59–61 as unpatentable under § 103(a) over Morinaka, Kotani, as evidenced by Lavoie, and Farrell

Appellant argues that the rejection of claims 59–61 is unpatentable over the combination of Morinaka, Kotani, as evidenced by Lavoie, and Farrell should be reversed because the Examiner has not established a prima facie case of obviousness with respect to independent claim 36. Appeal Br. 6. As discussed above, we have affirmed the rejection of claim 36. We, therefore, also affirm the rejection of claims 59–61.

IV. CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
36–42, 44, 48–58, 62–68, 75–77	103(a)	Morinaka, Kotani, Lavoie	36–42, 44, 48–58, 62–68, 75–77	
45, 46	103(a)	Morinaka, Kotani, Lavoie, Gerow	45, 46	
59–61	103(a)	Morinaka, Kotani, Lavoie, Farrell	59–61	
Overall Outcome			36–42, 44–46, 48–68, 75–77	

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)(iv).

AFFIRMED