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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JUN TAKANO and TERUNORI YAMAGUCHI

Appeal 2018-000733
Application 12/992,961
Technology Center 1700

Before ROMULO H. DELMENDO, LINDA M. GAUDETTE, and MICHAEL G. McMANUS, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

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[1] This Decision includes citations to the following documents: Specification filed Nov. 16, 2010 ("Spec."); Final Office Action dated May 20, 2016 ("Final"); Appeal Brief filed Apr. 12, 2017 ("Appeal Br."); Examiner's Answer dated Aug. 30, 2017 ("Ans."); and Reply Brief filed Oct. 27, 2017 ("Reply Br.").

Appellants[2] appeal under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1, 2, 6, and 7 under 35 U.S.C. § 103(a) over Tojo (JP 3585833 B, pub. Aug. 13, 2004 (machine translation)) in view of Vyas (US 2008/0044715 A1, pub. Feb. 21, 2008). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The present invention relates to a method for modifying a fluorine resin film in order to impart hydrophilicity to its surface. Spec. ¶ 1. The film may be used, for example, as a back sheet for a solar battery. *See id.* ¶ 10. Claim 1, the sole independent claim on appeal, is reproduced below.

> 1. A method for modifying a fluorine resin film comprising, preliminarily preparing a process gas by mixing a gas containing fluorine atoms at a concentration of 0.001 to 99% by volume and a gas containing oxygen atoms at a concentration of 0.001 to 20% by volume; and contacting the process gas with the fluorine resin film for a period of 1 second to 5 minutes, said fluorine resin film consisting essentially of a fluorine resin film other than ethylene/tetrafluoroethylene copolymer (ETFE), and wherein the fluorine resin film has a specific gravity greater than 1.6 and 2.2 or less, thereby giving hydrophilicity to a surface of the fluorine resin film, and wherein the fluorine resin film comprises 0.1 to 90% by weight of an organic additive having a functional group reactive with the process gas, wherein the functional group is selected from the group consisting of amide, amino, trialkylsilyl, silyl ether, $-Si(CH_3)_2O-$, ester, carbonate, ether, phosphorylcholine, sulfo,

[2] Appellants identify Stella Chemifa Corporation as the real party in interest. Appeal Br. 3.

> sulfonyl, methyl, methylene, phenyl, -CHX-, -CHX_2, -CX_2, and -CX_3, wherein X is at least one of F, Cl, Br, or I.

Appeal Br. 8.

The Examiner finds Tojo discloses or suggests the method as recited in claim 1 with the exception that the only fluorine resin film explicitly disclosed in Tojo is ETFE. Final 3–7 (citing, e.g., Tojo ¶¶ 8, 11, 14, 19, 32, 33). The Examiner finds Vyas relates to a method of making fluoropolymer materials hydrophilic for use in the fluid distribution channels of fuel cells. *Id.* at 7. The Examiner finds the fluoropolymer materials specifically mentioned by Vyas include ETFE and polyvinylidene (PVDF). *Id.* (citing Vyas ¶ 31). The Examiner finds one of ordinary skill in the art would have found it obvious to replace the ETFE in Tojo's fluorine resin film with PVDF based on Vyas' teaching that PVDF is a suitable alternative to ETFE. *Id.* The Examiner also finds one of ordinary skill in the art would have utilized polymethyl methacrylate (PMMA) in combination with PVDF based on Tojo's disclosure that PMMA and ETFE are suitable materials for forming films. *Id.* at 6 (citing Tojo ¶ 11).

Appellants' arguments on appeal raise the following issues: Have Appellants identified reversible error in the Examiner's findings that the applied prior art discloses or suggests (1) a method for modifying a "fluorine resin film ha[ving] a specific gravity greater than 1.6 and 2.2 or less" (claim 1), (2) a method comprising a step of preliminarily preparing a process gas by mixing a gas containing fluorine atoms and a gas containing oxygen atoms at concentrations of 0.001 to 99% and 0.001 to 20% by volume, respectively, and (3) a method for modifying a fluorine resin film comprising 0.1 to 90% by weight of an organic additive having a functional group reactive with the process gas? *See generally* Appeal Br. 6–7. We answer these questions in the negative for the reasons stated in the Final Office Action, the Answer, and below.

A method for modifying a "fluorine resin film ha[ving] a specific gravity greater than 1.6 and 2.2 or less"

A prima facie case of obviousness exists where the prior art and claimed ranges overlap, as well as in those cases where the claimed range and the prior art range, though not overlapping, are sufficiently close that one skilled in the art would have expected them to have the same properties. *See, e.g.*, *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003); *In re Geisler*, 116 F.3d 1465, 1469 (Fed. Cir. 1997).

Appellants do not dispute the Examiner's finding that Tojo discloses modifying fluorine resin films having a specific gravity of 1.6 or less, a range that touches Appellants' claimed range of "greater than 1.6 and 2.2 or less." Final 5; *see generally* Appeal Br. 5–7. The burden was thus properly shifted to Appellants to show that the prior art teaches away from the claimed invention or that the invention achieves new and unexpected results relative to the prior art. *See Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1322 (Fed. Cir. 2004).

Appellants argue Tojo discloses that polymeric materials having a specific gravity above 1.6 cannot be made hydrophilic. Appeal Br. 6 (citing Tojo ¶ 14). Appellants, however, have not identified persuasive evidence that "a person of ordinary skill, upon reading [Tojo], would [have been] discouraged from following the path set out in the reference, or would [have been] led in a direction divergent from the path that was taken by the applicant," *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (discussing references that "teach away"). More specifically, Appellants have not shown persuasively that the Examiner's finding that Tojo merely describes a preference for modifying films having a specific gravity of 1.6 or less is erroneous or unreasonable. *See* Ans. 3 (citing Tojo ¶¶ 8, 14); Reply Br. 3 (quoting Tojo ¶¶ 8, 14, 43, 44 as "demonstrat[ing] that a material having a specific gravity of more than 1.6 does not function for the purpose of the Tojo surface

modification"). To the contrary, the cited disclosure in Tojo favors the Examiner's finding that Tojo, at most, indicates that films having a specific gravity of 1.6 or less are more easily made hydrophilic. *See* Tojo ¶ 14 (indicating that modification of films having a specific gravity above 1.6 is more difficult); Tojo ¶¶ 43–44 (stating that hydrophilicity is easily imparted to materials having a specific gravity of not more than 1.6).

Appellants contend, "it was completely unexpected that the presently claimed invention can be used to treat materials having a specific gravity of more than 1.6." Appeal Br. 6. As explained by the Examiner (Ans. 2–4), Appellants have not provided evidence showing the claimed method achieves unexpected results when compared to Tojo's method. *See In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984) ("It is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification does not suffice.").

In sum, we are not persuaded of reversible error in the Examiner's finding that the applied prior art discloses or suggests a method for modifying a "fluorine resin film ha[ving] a specific gravity greater than 1.6 and 2.2 or less" (claim 1).

A method comprising a step of preliminarily preparing a process gas by mixing a gas containing fluorine atoms and a gas containing oxygen atoms at concentrations of 0.001 to 99% and 0.001 to 20% by volume, respectively

Appellants contend "Tojo discloses that an oxygen gas is contacted with a material to be treated, and then that a fluorine gas is introduced for fluorination," but "does not disclose that these gases are simultaneously contacted with a material to be treated at an initial stage." Appeal Br. 6–7 (citing Tojo ¶¶ 19, 32).

As explained by the Examiner, Appellants' argument is not persuasive because it is not commensurate in scope with the claim language. *See* Ans. 4

("[T]he claims do not require exposing the film to this gas mixture 'in an initial stage'. They only require exposing the film to a mixture of oxygen and fluorine.").[3] Moreover, we note that Appellants' own Specification (*see* Spec. 2:19–3:2) describes Tojo's surface-modifying method as including a step of "bringing *a mixed gas* composed of fluorine gas and a single gas containing an oxygen element into contact with the synthetic or natural polymeric material" (*id.* at 2:24–3:1). *See* Tojo ¶ 19 ("Processing time contacted in fluorine gas and gas containing oxygen will be minutes - several hours . . . .").

In sum, we are not persuaded of reversible error in the Examiner's finding that the applied prior art discloses or suggests a method comprising a step of preliminarily preparing a process gas by mixing a gas containing fluorine atoms and a gas containing oxygen atoms at concentrations of 0.001 to 99% and 0.001 to 20% by volume, respectively.[4]

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[3] *See also* Final 8 (determining that "even if the gases were required to be mixed before the substrate is exposed to any of them . . . , it would still be obvious to mix them before any such exposure" because selecting "any order of performing process steps is prima facie obvious in the absence of new or unexpected results").

[4] We need not address Appellants' contention that the claim 1 recitation requiring a process "gas containing oxygen atoms at a concentration of 0.001 to 20%" distinguishes the claim over the applied prior art (*see* Reply Br. 2), as it is not apparent why this argument could not have been raised in the Appeal Brief. We note, however, that the Specification indicates this range is not critical. *See* Spec. 15:4–11 ("The method of the invention for modifying a fluorine resin film can be performed in such a range that the oxygen-atom-containing gas concentration is from 0. 001 to 99% by volume of the whole of the process gas. However, the oxygen-atom-containing gas can produce an advantageous effect thereof sufficiently even in a small amount. It is therefore preferred from the viewpoint of treatment costs also that the gas concentration is low.").

A method for modifying a fluorine resin film comprising 0.1 to 90% by weight of an organic additive having a functional group reactive with the process gas

Appellants argue that Tojo describes the use of various synthetic polymeric materials, individually, but not in combination. Appeal Br. 7. Appellants thus contend the Examiner reversibly erred in finding Tojo discloses or suggests a fluorine resin film that includes an additive having a functional group reactive with the process gas. *Id.*

Appellants' argument is not persuasive because it fails to address the facts and reasons relied on by the Examiner, namely, that this claim limitation is suggested by *the combination* of Tojo and Vyas. *See* Ans. 4–5.

In sum, we are not persuaded of reversible error in the Examiner's finding that the applied prior art discloses or suggests a method for modifying a fluorine resin film comprising 0.1 to 90% by weight of an organic additive having a functional group reactive with the process gas.

Any additional arguments advanced by Appellants that are not discussed herein have been addressed by the Examiner and are unpersuasive for the reasons stated in the Final Office Action and the Answer. We note that Appellants' do not present separate arguments in support of patentability of dependent claims 2, 6, and 7. *See* Appeal Br. 7. Accordingly, we sustain the rejection of claims 1, 2, 6, and 7. *See* 37 C.F.R. § 41.37(c)(iv).

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