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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NED E. CIPOLLINI

Appeal 2019-000902
Application 14/758,572
Technology Center 1700

Before BEVERLY A. FRANKLIN, JEFFREY B. ROBERTSON, and
MONTÉ T. SQUIRE, *Administrative Patent Judges*.

SQUIRE, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellant² appeals under 35 U.S.C. § 134(a) from the Examiner’s decision finally rejecting claims 11 and 15–31, which are all of the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ In this Decision, we refer to the Specification filed June 30, 2015 (“Spec.”); Final Office Action dated Nov. 21, 2017 (“Final Act.”); Advisory Action dated Mar. 7, 2018 (“Adv. Act.”); Appeal Brief filed June 1, 2018 (“Appeal Br.”); Examiner’s Answer dated Sept. 10, 2018 (“Ans.”); and Reply Brief filed Nov. 12, 2018 (“Reply Brief”).

² We use the word “Appellant” to refer to “Applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies Doosan Fuel Cell America, Inc. as the real party in interest. Appeal Br. 1.

The Claimed Subject Matter

Appellant's disclosure relates to a method for making an electrode for a phosphoric acid fuel cell using a soluble fluoropolymer. Abstract; Spec.

¶¶ 1, 10, 11. Claim 11 is illustrative of the claimed subject matter on appeal and is reproduced below from the Claims Appendix to the Appeal Brief:

11. A method for making an electrode for a phosphoric acid fuel cell, the method comprising:

combining catalyst particles with a fluoropolymer solution to form a catalyst-fluoropolymer dispersion;

depositing the catalyst-fluoropolymer dispersion onto a heated substrate to produce a deposit on the substrate;

wetting the deposit and the substrate with solvent;

and

pressing the wetted deposit and the substrate to obtain the electrode.

Appeal Br. 12 (key disputed claim language italicized and bolded).

The References

The Examiner relies on the following prior art references as evidence in rejecting the claims on appeal:

Reddy et al. ("Reddy")	US 5,084,144	Jan. 28, 1992
Dhar	US 5,521,020	May 28, 1996
Hampden-Smith et al. ("Hampden-Smith")	US 2003/0198849 A1	Oct. 23, 2003
Gascoyne et al. ("Gascoyne")	US 2004/0076871 A1	Apr. 22, 2004
Hong et al. ("Hong")	US 2007/0184334 A1	Aug. 9, 2007
Natter et al. ("Natter")	US 2010/0273085 A1	Oct. 28, 2010
Ziser et al. ("Ziser")	US 2011/0091788 A1	Apr. 21, 2011
Mitchell et al. ("Mitchell")	US 2014/0045095 A1	Feb. 13, 2014

The Rejections

On appeal, the Examiner maintains (Ans. 3) the following rejections³:

1. Claims 21, 24, 26, and 27 are rejected under 35 U.S.C. § 112(b) or pre-AIA 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or for pre-AIA, the applicant regards as the invention

(“Rejection 1”). Final Act. 3–4.

2. Claims 11, 15–19, 21, 22, and 24–27 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Hong in view of Dhar and Ziser (“Rejection 2”). *Id.* at 5–9.

3. Claim 20 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Hong in view of Dhar and Ziser as applied to claim 11 above, and further in view of Hampden-Smith (“Rejection 3”). *Id.* at 9.

4. Claim 23 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Hong in view of Dhar and Ziser as applied to claim 11 above, and further in view of Gascoyne (“Rejection 4”). *Id.* at 9–10.

5. Claim 28 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Hong in view of Dhar and Ziser as applied to claim 27 above, and further in view of Mitchell (“Rejection 5”). *Id.* at 10–11.

6. Claim 29 is rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Hong in view of Dhar and Ziser as applied to claim 11 above, and further in view of Gascoyne and Natter (“Rejection 6”). *Id.* at 11–12.

³ The Examiner’s § 112 rejections of claims 15, 28, and 29 for indefiniteness (*see* Final Act. 3–4) and § 101 rejection of claims 28 and 29 (*id.* at 4) are withdrawn by the Examiner at page 3 of the Answer.

7. Claims 30 and 31 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Hong in view of Dhar and Ziser as applied to claim 11 above, and further in view of Reddy (“Rejection 7”). *Id.* at 12–13.

OPINION

Having considered the respective positions advanced by the Examiner and Appellant in light of this appeal record, we affirm the Examiner’s rejections based on the fact-finding and reasoning set forth in the Answer, Advisory Action, and Final Office Action, which we adopt as our own. We add the following primarily for emphasis.

Rejection 1

The Examiner rejects claims 21, 24, 26, and 27 under § 112 for indefiniteness. Final Act. 3–4. In particular, the Examiner determines that the phrase “moderate temperature and pressure” of claim 21; the term “ultraporous” of claim 24; and the terms “high sheer” and “ultra sheer” of claims 26 and 27 are all indefinite because they are relative terms, i.e., terms of degree, which are not defined by the claim, and the Specification does not provide a standard for ascertaining the requisite degree. *Id.* at 3. Thus, the Examiner determines one of ordinary skill in the art would not be reasonably apprised of the scope of the invention, as recited in each of the rejected claims. *Id.* at 3–4. The Examiner also determines that claim 27 is indefinite because there is insufficient antecedent basis for “the catalyst suspension” recitation of the claim. *Id.* at 4.

In response, Appellant principally argues the Examiner’s rejection should be reversed because the claim terms identified by the Examiner are

not indefinite, but instead, are sufficiently clear to a person of skill in the art and a person of skill in the art reading each claim in its entirety would have understood each term's meaning. *See* Appeal Br. 3–4; Reply Br. 1–2.

We do not find Appellant's argument persuasive of reversible error in the Examiner's rejection. During prosecution, a claim is properly rejected as indefinite if, after applying the broadest reasonable interpretation, the metes and bounds of the claimed subject matter are not clear. *Ex parte McAward*, Appeal 2015-006416, 2017 WL 3669566, at *5 (PTAB Aug. 25, 2017) (precedential) (quoting *In re Packard*, 751 F.3d 1307, 1314 (Fed. Cir. 2014)) (“[A] claim is indefinite when it contains words or phrases whose meaning is unclear.”). Claim language reciting “words of degree” is imprecise unless a definition or guideline is set forth in the Specification by which the recited degree can be measured, such that the scope of the claim can be ascertained. *Seattle Box Co. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984) (“When a word of degree is used the . . . court must determine whether the patent's specification provides some standard for measuring that degree.”).

Based on the Examiner's fact-finding and reasoning provided at pages 3–4 of the Answer and pages 3–4 of the Final Office Action, we concur with the Examiner's determination that claims 21, 24, 26, and 27 are indefinite. In particular, as the Examiner finds (Ans. 3–4; Final Act. 3–4), the phrase “moderate temperature and pressure” of claim 21, the term “ultraporous” of claim 24, and the terms “high sheer” and “ultra sheer” of claims 26 and 27 are all relative terms of degree and the Specification does not provide a standard by which the recited degree can be measured, such that the scope of the claims cannot be ascertained.

For example, although the Specification states that “amorphous fluoropolymers can be soluble in solvent at ambient temperatures, while the semi crystalline copolymers can require an elevated temperature in order to be soluble in solvent” (Spec. ¶ 36), it does not provide a standard or guideline for determining what may constitute a “moderate temperature and pressure,” as recited in claim 21. Similarly, although paragraph 41 of the Specification states that the catalyst dispersion and fluoropolymer solution are “mixed in a high sheer/ultra sheer mixing step 26” and the “deposit is ultraporous due to the large volume of gas generated by solvent evaporation,” the Specification does not define these terms. Appellant also does not identify or direct us to any portion of the Specification where these terms are defined or a standard for measuring the recited degree is provided.

Appellant’s contentions that the recited terms are sufficiently clear to a person of skill in the art and a person of skill in the art would have understood the meaning of each term (Appeal Br. 3–4) are not persuasive of reversible error in the Examiner’s rejection because they are conclusory. *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984); *see also In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (explaining that mere lawyer’s arguments or conclusory statements, which are unsupported by concrete factual evidence, are entitled to little probative value).

Accordingly, we affirm the Examiner’s rejection of claims 21, 24, 26, and 27 under 35 U.S.C. § 112 for indefiniteness.

Rejection 2

Appellant argues claims 11, 15–19, 21, 22, and 24–27 as a group. Appeal Br. 6. We select independent claim 11 as representative and the

remaining claims subject to the Examiner's rejection stand or fall with claim 11. 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner determines that the combination of Hong, Dhar, and Ziser suggests a method of making an electrode for use in a phosphoric acid fuel cell satisfying all of the steps of claim 11 and, thus, concludes the combination would have rendered the claimed method obvious. Final Act. 5–7 (citing Hong, Abstract, Figs. 1A, 2, ¶¶ 23, 24, 30, 34, 38–42, 45; Abstract, 5:25–40; Ziser, Abstract, ¶¶ 127–130, 138).

Appellant argues that the Examiner's rejection should be reversed because “the Hong reference teaches away from using the technique of the *Dhar* reference.” Appeal Br. 6; *see also* Reply Br. 2 (arguing the “Examiner cannot avoid the way in which the *Hong* reference teaches away from the technique of the *Dhar* reference”). In particular, relying on paragraph 48 of Hong, Appellant contends that because Hong teaches binding water repellent material to a catalyst before exposing the catalyst to an electrolyte such as phosphoric acid and Dhar teaches mixing a catalyst with an electrolyte and applying that mixture to the electrode that already contains the water repellent material, “a person of skill would be led away from using the *Dhar* reference for . . . modifying the *Hong* reference.” Appeal Br. 6.

We do not find Appellant's teaching away argument persuasive of reversible error in the Examiner's rejection because Appellant does not identify sufficient evidence to support it, and we will not read into the references a teaching away where no such language exists. *Cf. DyStar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006). Appellant does not direct us to any teaching in Hong or Dhar which discourages one of ordinary skill in the art from depositing the

catalyst-fluoropolymer dispersion onto a heated substrate in the manner claimed. *In re Fulton*, 391 F.3d 1195, 1201 (finding there is no teaching away where the prior art's disclosure "does not criticize, discredit, or otherwise discourage the solution claimed").

Although paragraph 48 of Hong describes an embodiment where the "electrode may be doped with an acid, such as phosphoric acid" and "[w]hen the electrode is doped with the acid, the metal catalyst is prevented from sinking in the acid," such disclosure, without more, does not teach away from Dhar's method of catalyzing a gas diffusion electrode over a hot plate. *See In re Susi*, 440 F.2d 442, 445-46 (CCPA 1971) (explaining disclosure of a particular embodiment does not teach away from a prior art reference's broader disclosure). Contrary to what Appellant's argument suggests, paragraph 48 of Hong, when read in context, does not require that the electrode be doped. Rather, it merely states that the electrode "*may* be doped with an acid, such as phosphoric acid." *See id.* at ¶ 48 (emphasis added).

Moreover, as the Examiner finds (Final Act. 5-6), Hong discloses a method of making an electrode for use in a phosphoric acid fuel cell comprising a catalyst-fluoropolymer dispersion (Hong, Abstract, ¶¶ 23, 24, 30, 45, 51, Figs. 1A, 2) and Dhar discloses applying a catalyst paste to the catalyzable side of the gas diffusion electrode while the electrode is preferably kept over a hot plate at a temperature of about 80°-100° C (Dhar 5:25-40). Hong's disclosure at paragraph 48 regarding a specific embodiment where the electrode may be doped does criticize or teach away from Dhar's disclosure in this regard.

Appellant further argues the “*Dhar* reference . . . does not teach depositing a catalyst-fluoropolymer onto a heated substrate,” as required by the claim. Appeal Br. 7. We do not find this argument persuasive of reversible error because Appellant attacks the references individually rather than the combined teachings of the prior art as a whole. One cannot show non-obviousness by attacking references individually where the rejection is based on a combination of references. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Appellant’s argument is premised on what Appellant contends *Dhar* teaches individually, and not the combined teachings of the cited references as a whole and what the combined teachings would have suggested to one of ordinary skill in the art.

As the Examiner finds (Final Act. 5–6) and previously discussed above, Hong is relied upon in the rejection for teaching combining catalyst particles with a fluoropolymer solution to form a catalyst-fluoropolymer dispersion (Hong ¶¶ 23, 24, 30, Figs. 1A, 2), while *Dhar* is relied upon for teaching depositing the catalyst-fluoropolymer dispersion onto a heated substrate, i.e., a “hot plate” (*Dhar* 5:25–40).

Appellant also argues the Examiner’s rejection should be reversed because Ziser does not teach or suggest the steps of “wetting the deposit and the substrate” and “pressing the wetted deposit,” as claimed, and there is no reason for combining Ziser’s teachings with the combination of Hong and *Dhar*. Appeal Br. 8. In particular, Appellant contends Ziser teaches assembling an electrode into a membrane and “[t]hat is not the same thing as applying a catalyst-fluoropolymer dispersion to a substrate under pressure.” *Id.* at 8 (citing Ziser ¶ 130). Appellant also contends that impregnating an

electrode with phosphoric acid, as described in paragraph 138 of Ziser, “is not the same thing as wetting [the deposit],” as recited in the claim. *Id.* at 8.

We do not find Appellant’s contentions persuasive because they are conclusory and unsupported by persuasive evidence in the record. *De Blauwe*, 736 F.2d at 705; *Geisler*, 116 F.3d at 1470. On the contrary, we find a preponderance of the evidence supports the Examiner’s finding that Ziser teaches or suggests the steps of “wetting the deposit and the substrate” and “pressing the wetted deposit” in the manner claimed.

In particular, as the Examiner finds (Final Act. 6–7), Ziser discloses transferring the electrode into a membrane-electrode assembly by hot pressing via application of pressure and temperature (Ziser ¶¶ 127–130) and that the electrodes are impregnated with phosphoric acid, combined with the electrolyte membrane, and hot-pressed (*id.* at ¶ 138), which a person of ordinary skill in the art would have reasonably understood as corresponding to the “wetting the deposit and the substrate” and “pressing the wetted deposit” recitations of the claim.

The Examiner also provides a reasoned basis, which is supported by a preponderance of the evidence in the record, to evince why one of ordinary skill would have combined the teachings of Ziser with Hong and Dhar to arrive at Appellant’s claimed method. Final Act. 6–7. *See also KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 416 (2007) (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”).

Appellant fails to direct us to persuasive evidence or provide an adequate technical explanation to establish why the Examiner’s articulated reasoning lacks a rational underpinning or is otherwise based on some other

reversible error. Appellant’s disagreement as to the Examiner’s factual findings and reasoning for combining the references, without more, is insufficient to establish reversible error. *Cf. SmithKline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1320 (Fed. Cir. 2006) (“[M]ere statements of disagreement . . . as to the existence of factual disputes do not amount to a developed argument.”).

Accordingly, we affirm the Examiner’s rejection of claims 11, 15–19, 21, 22, and 24–27 under 35 U.S.C. § 103(a) as obvious over the combination of Hong, Dhar, and Ziser.

Rejections 3, 4, 6, and 7

The Examiner’s Rejections 3, 4, 6, and 7 (stated above) are all obviousness rejections based primarily upon the combination of Hong, Dhar, and Ziser, which is discussed above for Rejection 2.

Appellant, however, does not present any new or additional substantive arguments in response to these rejections. Rather, Appellant relies on principally the same arguments previously presented and discussed above in response to Rejection 2. *See* Appeal Br. 9–10.

Accordingly, based on the findings and technical reasoning provided by the Examiner and for principally the same reasons discussed above for affirming the Examiner’s rejection of claims 11, 15–19, 21, 22, and 24–27 based on the combination of Hong, Dhar, and Ziser (Rejection 2, stated above), we affirm Rejections 3, 4, 6, and 7.

Rejection 5

Claim 28 depends from claim 27 and further recites “wherein the sonicating comprises using an ultrasonic sonicator for 5 minutes with pulses

of 5 seconds on and 5 seconds off at a power of 20%, 50 w.” Appeal Br. 13 (Claims Appendix).

The Examiner determines that the combination of Hong, Dhar, Ziser, and Mitchell suggests a method satisfying all of the steps of claim 28 and thus, concludes the combination would have rendered the claim obvious. Final Act. 10–11.

Appellant argues the Examiner’s rejection of claim 28 should be reversed for the same reasons previously presented and discussed above in response to the Examiner’s Rejection 2. Appeal Br. 9. We do not find this argument persuasive for principally the same reasons discussed above for affirming the Examiner’s Rejection 2.

Appellant further argues the cited art does not teach the “using an ultrasonic sonicator for 5 minutes with pulses of 5 seconds on and 5 seconds off at a power of 20%, 50 w” recitation of the claim. Appeal Br. 9. We do not find this argument persuasive of reversible error in the Examiner’s rejection based on the fact-finding and reasoning provided by the Examiner at pages 6–7 of the Answer and pages 10–11 of the Final Action.

In particular, we find a preponderance of evidence and sound technical reasoning support the Examiner’s determination that it would have been obvious to a person having ordinary skill in the art at the time of the invention to have performed the sonicating for the claimed time period, pulse length, and power through routine experimentation because the general conditions of the claim are known. *See Mitchell* ¶ 44 (disclosing the “material is then sonicated again for about 5 minutes, set to a pulse mode of 10 seconds on and 10 seconds off at 18 watts”); *see also In re Aller*, 220 F.2d 454, 456 (CCPA 1955) (“[W]here the general conditions of a claim are

disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”). In this regard, we observe that the Specification assigns no particular criticality to the pulse times and power in the ultrasonic sonicator, but rather describes the pulses of five seconds on and five seconds off and power of 20%, 50 W as “example” conditions. Spec. ¶ 43.

Appellant’s contentions that “the *Mitchel* reference teaches different conditions” (Appeal Br. 9) and “[t]he parameters taught by the *Mitchel* reference are different than those required for establishing a *prima facie* case of obviousness” (Reply Br. 4) are conclusory and, without more, insufficient to rebut or otherwise establish reversible error in the Examiner’s factual findings and analysis in this regard.

Accordingly, we affirm the Examiner’s rejection of claim 28 under 35 U.S.C. § 103(a) as obvious over the combination of Hong, Dhar, Ziser, and Mitchell.

CONCLUSION

In summary:

Claim(s) Rejected	Basis	Affirmed	Reversed
21, 24, 26, 27	§ 112	21, 24, 26, 27	
11, 15–19, 21, 22, 24–27	§ 103(a) Hong, Dhar, Ziser	11, 15–19, 21, 22, 24–27	
20	§ 103(a) Hong, Dhar, Ziser, Hampden-Smith	20	
23	§ 103(a) Hong, Dhar, Ziser, Gascoyne	23	
28	§ 103(a) Hong, Dhar, Ziser, Mitchell	28	
29	§ 103(a) Hong, Dhar, Ziser, Gascoyne, Natter	29	
30, 31	§ 103(a) Hong, Dhar, Ziser, Reddy	30, 31	
Overall Outcome		11, 15–31	

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