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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
13/176,523 07/05/2011 Osman Ahmed 2011P13578US 4735

28524 7590 11/18/2016
SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
3501 Quadrangle Blvd Ste 230
Orlando, FL 32817

EXAMINER

RAPHAEL, COLLEEN M

ART UNIT PAPER NUMBER

1756

NOTIFICATION DATE DELIVERY MODE

11/18/2016

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* OSMAN AHMED, MAXIMILIAN FLEISCHER,  
BEATE SCHLAGETER, and HEINRICH ZEININGER

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Appeal 2015-006725  
Application 13/176,523  
Technology Center 1700

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Before BEVERLY A. FRANKLIN, BRIAN D. RANGE, and LILAN REN,  
*Administrative Patent Judges.*

RANGE, *Administrative Patent Judge.*

DECISION ON APPEAL

SUMMARY

Appellants<sup>1</sup> appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1–24, 27–32, and 35–42. We have jurisdiction. 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> According to the Appellants, the real party in interest is Siemens Aktiengesellschaft. Appeal Br. 3.

STATEMENT OF THE CASE

Appellants describe the invention as relating to a panel for converting atmospheric gas into an output product via a photosynthesis reaction.

Appeal Br. 4. For example, carbon dioxide could be converted into methanol, carbon monoxide, or other hydrocarbons. Spec. ¶¶ 24, 28. Claim 1, reproduced below with emphasis added to certain key recitations, is illustrative of the claimed subject matter:

1. A photocatalytic panel comprising:
  - a housing having a plurality of walls defining a chamber and an outlet in communication with said chamber, at least one wall having a portion that is transmissive to sunlight;
  - a photo-conversion element disposed within said chamber, wherein upon exposure to sunlight, **said photo-conversion element converts an atmospheric gas into an output product dischargeable through said outlet;** and
  - at least one of said plurality of walls includes a permeable portion having a high permeability to the atmospheric gas and a low permeability to said output product.**

Appeal Br.<sup>2</sup> 14 (Claims Appendix).

REFERENCES

The Examiner relies upon the prior art below in rejecting the claims on appeal:

Gonzalez-Martin et al. (hereinafter “Gonzales- Martin ’186”)	US 6,136,186	Oct. 24, 2000
Gonzalez-Martin et al.	US 6,156,211	Dec. 5, 2000

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<sup>2</sup> In this decision, we refer to the Final Office Action mailed June 3, 2014 (“Final Act.”), the Appeal Brief filed December 2, 2014 (“Appeal Br.”), the Examiner’s Answer mailed May 21, 2015 (“Ans.”), and the Reply Brief filed July 7, 2015 (“Reply Br.”).

Appeal 2015-006725  
Application 13/176,523

(hereinafter “Gonzales-  
Martin ’211”)

Guerra	US 2003/0228727 A1	Dec. 11, 2003
Baldeschieler	US 2005/0166953 A1	Aug. 4, 2005
Lee et al.	US 2009/0155605 A1	Jun. 18, 2009
(hereinafter “Lee”)		
Monzyk et al.	US 2009/0220388 A1	Sep. 3, 2009
(hereinafter “Monzyk”)		
Sela	US 2011/0265840 A1	Nov. 3, 2011

### REJECTIONS

The Examiner maintains the following rejections on appeal:

Rejection 1. Claims 1–7, 10, 12, 13, 17, 18, 21, 22, 27, 31, 35–39, and 42 under 35 U.S.C. § 102(b) as anticipated by Monzyk. Ans. 2.

Rejection 2. Claims 1, 2, 6, 8, 10, 12, 13, 15–21, 24, 27, and 35–39 under 35 U.S.C. § 102(b) as anticipated by Gonzales-Martin ’186. *Id.* at 5.

Rejection 3. Claims 1, 2, 6, 8, 10, 12, 13, 28–30, 32, and 35–41 under 35 U.S.C. § 102(b) as anticipated by Gonzales-Martin ’211. *Id.* at 8.

Rejection 4. Claim 9 under 35 U.S.C. § 103 as obvious over Monzyk (or, alternatively, Gonzalez-Martin ’186) in view of Guerra. *Id.* at 11.

Rejection 5. Claim 11 under 35 U.S.C. § 103 as obvious over Monzyk (or, alternatively, Gonzalez-Martin ’186) view of Lee. *Id.* at 12.

Rejection 6. Claim 14 under 35 U.S.C. § 103 as obvious over Monzyk (or, alternatively, Gonzalez-Martin ’186) view of Baldeschieler. *Id.*

Rejection 7. Claim 23 under 35 U.S.C. § 103 as obvious over Monzyk (or, alternatively, Gonzalez-Martin ’186) view of Salas. *Id.* at 13.<sup>3</sup>

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<sup>3</sup> The Examiner’s heading for this rejection refers to claim 14, but the text of the rejection refers to claim 23. Ans. 13. The typographical error is

## ANALYSIS

We review the appealed rejections for error based upon the issues identified by Appellants and in light of the arguments and evidence produced thereon. *Cf. Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“it has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections”)). After having considered the evidence presented in this Appeal and each of Appellants’ contentions, we are not persuaded that Appellants identify reversible error, and we affirm the Examiner’s rejections for the reasons expressed in the Final Office Action and the Answer. We add the following primarily for emphasis.

Claim Construction. As a threshold matter, Appellants argue that each of the Examiner’s rejections is erroneous because the Examiner failed to give proper weight to claim 1’s recitation “said photo-conversion element converts an atmospheric gas into an output product dischargeable through said outlet.” Appeal Br. 14 (Claims Appendix); *see also* Reply Br. 4–6. We agree with Appellants that the recitation limits the scope of claim 1, but we also note that the language is functional because it defines the recited “photo-conversion element” by its function rather than by its structure.

While a patent applicant may recite features structurally or functionally, “choosing to define an element functionally, *i.e.*, by what it does, carries with it a risk.” *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997). In particular, where there is reason to believe that prior art structure is inherently capable of performing the claimed function, the burden shifts to

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harmless because Appellants understood this rejection as applying to claim 23. Appeal Br. 3.

the applicant to show that the claimed function patentably distinguishes the claimed structure from the prior art structure. *See id.*; *In re Hallman*, 655 F.2d 212, 215 (CCPA 1981) (affirming rejections where applicant failed to show that prior art structures were not inherently capable of functioning as claimed invention). Below, we address the Examiner’s rejections and Appellants’ arguments with this legal framework in mind.

Rejection 1. The Examiner rejects claims 1–7, 10, 12, 13, 17, 18, 21, 22, 27, 31, 35–39, and 42 as anticipated by Monzyk. Ans. 2. Appellants do not separately argue claims 2–7, 10, 12, 13, 17, 18, 21, 22, 27, 31, 35–39, and 42. We therefore limit our discussion to claim 1. Claims 2–7, 10, 12, 13, 17, 18, 21, 22, 27, 31, 35–39, and 42 stand or fall with that claim. 37 C.F.R. § 41.37(c)(1)(iv) (2013).

The Examiner finds that Monzyk teaches each recited element of claim 1. Final Act. 2 (providing citations to Monzyk). In the Answer, the Examiner finds that parts 520 and 522 of Figure 5 of Monzyk are a “permeable portion of the plurality of the housing walls having a high permeability to gas and a low permeability to output product. . . .” Ans. 14 (citing Monzyk Fig. 5, ¶ 38). A preponderance of the evidence, as cited by the Examiner, supports the Examiner’s findings.

Appellants argue that Monzyk does not teach all recitations of claim 1 because it does not teach converting “an atmospheric gas into an output product dischargeable through an outlet upon exposure to sunlight. . . .” Appeal Br. 8 (emphasis removed). Appellants suggest that Monzyk relates only to conversion of liquid phase water. *Id.* A preponderance of the evidence, however, supports the Examiner’s position that Monzyk teaches that its device converts gaseous water vapor (an atmospheric gas) into hydrogen ions and oxygen (an output product). Ans. 14. Monzyk explains,

for example that needed hydrogen atoms “arise from the water (moisture or RH) of the stale air. . . .” Monzyk ¶ 50; *see also id.* at ¶ 38 (“When the system **500** is in operation[,], light impinging the photo catalyst **526** splits water in the anode compartment that is in contact with the photo catalyst **526** and produces oxygen . . . .”). Moreover, the evidence establishes that gaseous water (*i.e.*, water vapor) is an atmospheric gas. Ans. 14. Thus, the preponderance of the evidence adequately establishes that Monzyk’s photo-conversion element is capable of “convert[ing] an atmospheric gas into an output product dischargeable through said outlet,” and Appellants have not established that the claim 1’s functional recitation distinguishes the structure of claim 1 from Monzyk’s prior art structure.

Appellants also argue that Monzyk’s wall 524 is not permeable to the input atmospheric gas and therefore does not meet the “at least one of said plurality of walls includes a permeable portion having a high permeability to the atmospheric gas and a low permeability to said output product” recitation of claim 1. Appeal Br. 8–9. The Examiner, however, finds that Monzyk’s parts 520 and 522 as illustrated in Figure 5 teach this recitation (Ans. 14), and Appellants do not persuasively dispute this finding.

Because Appellants have not identified reversible Examiner error, we sustain the Examiner’s rejection of claims 1–7, 10, 12, 13, 17, 18, 21, 22, 27, 31, 35–39, and 42 as anticipated by Monzyk.

Rejection 2. The Examiner rejects claims 1, 2, 6, 8, 10, 12, 13, 15–21, 24, 27, and 35–39 as anticipated by Gonzales-Martin ’186. Ans. at 5. Appellants again argue only claim 1, so all other claims stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv) (2013).

The Examiner finds that Gonzales-Martin ’186 teaches each recited element of claim 1. Final Act. 5 (providing citations to Gonzales-Martin

'186). A preponderance of the evidence, as cited by the Examiner, supports the Examiner's findings.

Appellants argue that Gonzales-Martin '186 does not disclose claim 1's recited "[wall that] includes a permeable portion having a high permeability to the atmospheric gas and a low permeability to said output product." Appeal Br. 9. In particular, Appellants argue that only the oxidant of Gonzales-Martin passes through its permeable walls 76, 78 rather than the "atmospheric gas" recited by claim 1. *Id.* A preponderance of the evidence, however, supports the Examiner's finding that the oxidant of Gonzales-Martin is an atmospheric gas. Ans. 15–16. For example, the oxidant can be ozone which is an atmospheric gas. *Id.* Moreover, the oxidant could also be oxygen, another atmospheric gas. Gonzales-Martin '186 3:48–53 ("The present invention combines a porous semiconductor material . . . and an efficient oxidant, such as electrochemically generated ozone (O<sub>3</sub>) . . . or oxygen (O<sub>2</sub>).").

Because Appellants have not identified reversible Examiner error, we sustain the Examiner's rejection of claims 1, 2, 6, 8, 10, 12, 13, 15–21, 24, 27, and 35–39 as anticipated by Gonzales-Martin '186.

Rejection 3. The Examiner rejects claims 1, 2, 6, 8, 10, 12, 13, 28–30, 32, and 35–41 as anticipated by Gonzales-Martin '211. Ans. 8. Appellants again argue only claim 1, so all other claims stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv) (2013).

The Examiner finds that Gonzales-Martin '211 teaches each recited element of claim 1. Final Act. 8 (providing citations to Gonzales-Martin '186). A preponderance of the evidence, as cited by the Examiner, supports the Examiner's findings.

Appellants raise the arguments addressed above with respect to Gonzales-Martin '186. Appellants' arguments do not identify reversible Examiner error for substantially the same reasons as those explained above. *See also* Ans. 17–18 (providing citations to Gonzales Martin '211); Gonzales-Martin '211 2:15–25 (explaining that oxidant can be ozone or oxygen). We thus sustain the Examiner's rejection of claims 1, 2, 6, 8, 10, 12, 13, 28–30, 32, and 35–41 as anticipated by Gonzales-Martin '211.

Rejections 4–7. The Examiner rejects dependent claims 9, 11, 14, and 23 as obvious over Monzyk (or, alternatively, Gonzalez-Martin '186) in view of Guerra, Lee, Baldeschwieler, and Salas respectively. Ans. 11–13. Claims 9, 11, 14, and 23 each depend from claim 1. Appellants argue that the Guerra, Lee, Baldeschwieler, and Salas references do not teach recitations of claim 1 that Appellants argued were lacking from Monzyk and Gonzalez-Martin '186. Appeal Br. 10–12. Because, for the reasons explained above, a preponderance of the evidence supports that Monzyk and Gonzalez-Martin '186 each teach all elements of claim 1, Appellants' arguments do not establish reversible error. Accordingly, we sustain the Examiner's obviousness rejections.

#### DECISION

For the above reasons, we affirm the Examiner's rejection of claims 1–24, 27–32, and 35–42.

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

AFFIRMED