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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHIN HOCK TOH, TUCK FOONG KOH,
SRISKANTHARAJAH THIRUNAVUKARASU,
JEN SERN LEW, ARVIND SUNDARRAJAN,
and SESHADRI RAMASWAMI

Appeal 2019-004974
Application 14/602,885
Technology Center 1700

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

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–5, 7–12, 16, and 18–22. We have jurisdiction under 35 U.S.C. § 6(b).

We *pro forma* REVERSE and enter a new ground of rejection pursuant to 37 C.F.R. § 41.50(b).

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Applied Materials, Inc. (Appeal Br. 3).

Appellant's invention is directed to an apparatus for producing thin silicon chips used in the microelectronics manufacturing industry (Spec. ¶¶ 2–4). According to the Specification, carriers facilitate the effective plasma processing of thin silicon wafers for chip manufacturing (*id.* ¶ 4). The Specification describes a resilient sealing ridge for holding a substrate on the perimeter of a substrate carrier's top surface (*id.* ¶ 6; Figs. 4, 12; claim 1).

Claim 1 is representative of the subject matter on appeal:

1. A substrate carrier comprising;
 - a top surface for holding a substrate, the top surface having a perimeter;
 - a sealing ridge on the perimeter of the top surface extending above the top surface to contact a perimeter of the substrate when the substrate is being carried, wherein the sealing ridge further comprises a heat treated seal coating over a top and over inner and outer side surfaces of the sealing ridge, the heat treated seal coating not on portions of the top surface exposed by the sealing ridge, the heat treated seal coating to contact the substrate and prevent materials from passing past the sealing ridge to contact the substrate.

Appellant appeals the following rejections:

1. Claims 1 and 18 are rejected under 35 U.S.C. § 112(a) as failing to comply with the written description requirement.
2. Claims 1, 11, and 22 are rejected under 35 U.S.C. § 103 as unpatentable over Shiraiwa et al. (US 2012/0287552 A1; pub. Nov. 15, 2012; “Shiraiwa”) in view of Vartabedian et al. (US 2010/0323124 A1; pub. Dec. 23, 2010; “Vartabedian”), and further in view of Shih et al. (US 2008/0169588 A1; pub. July 17, 2008; “Shih”).

3. Claims 2–5 are rejected under 35 U.S.C. § 103 as unpatentable over Shiraiwa in view of Vartabedian, Shih, and further in view of Lin et al. (US 2013/0120897 A1; pub. May 16, 2013; “Lin”).
4. Claim 18 is rejected under 35 U.S.C. § 103 as unpatentable over Shimizu et al. (US 7,195,673 B2; iss. Mar. 27, 2007; “Shimizu”) in view of Stevens et al. (US 2012/0267049 A1; pub. Oct. 25, 2012; “Stevens”), Ke et al. (US 6,284,093 B1; iss. Sept. 4, 2001; “Ke”), Shiraiwa, Vartabedian, and further in view of Shih.
5. Claims 1–5, 7–10, 12, and 16 are rejected under 35 U.S.C. § 103 as unpatentable over McCutcheon et al. (US 2011/0308739 A1; pub. Dec. 22, 2011; “McCutcheon”) in view of Burggraf et al. (US 2014/0374144 A1; pub. Dec. 25, 2014; “Burggraf”), and further in view of Flaim et al. (US 2009/0218560 A1; pub. Sept. 3, 2009; “Flaim”) as evidenced by Ash, Michael, Handbook of Solvents, 2nd Ed. pp. 485 (2013), and Wypych, George, Handbook of Fillers, 3rd Ed. pp. 711.
6. Claim 11 is rejected under 35 U.S.C. § 103 as unpatentable over McCutcheon in view of Burggraf, Flaim, and further in view of Landesberger (US 2015/0332944 A1; pub. Nov. 19, 2015).
7. Claim 21 is rejected under 35 U.S.C. § 103 as unpatentable over McCutcheon in view of Burggraf, Flaim, and further in view of Zhang et al. (US 2007/0284758 A1; pub. Dec. 13, 2007; “Zhang”).

8. Claims 18–20 are rejected under 35 U.S.C. § 103 as unpatentable over Shimizu in view of Stevens, Ke, McCutcheon, Burggraf, and further in view of Flaim.

FINDINGS OF FACT & ANALYSIS

The issue in this appeal concerns the meaning of “exposed by” in the phrase “a heat treated seal coating over a top and over inner and outer side surfaces of the sealing ridge, the heat treated seal coating not on portions of the top surface *exposed by* the sealing ridge” present in claims 1 and 18. (emphasis added). Claims 1 and 18 recite a negative limitation. We determine whether the negative limitation clearly recites what is excluded. We determine that the phrase renders the claim indefinite under 35 U.S.C. § 112(b) for the reasons discussed below.

Figure 4 of the Specification, reproduced below, illustrates a side cross-sectional view of a ridge formed on a carrier by deposition:

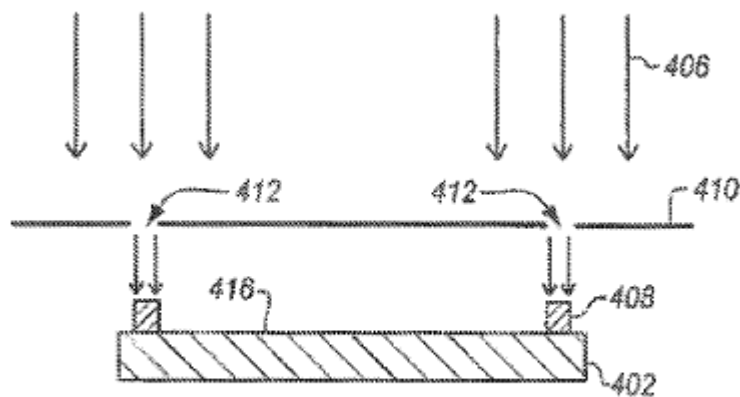


FIG. 4

Figure 4 illustrates, *inter alia*, the formation of circumferential ridge 408 by depositing spin coat material 406 in a ring shape around the edge of carrier 402 using slit 412 onto top surface 416 (Spec. ¶ 31).

The Examiner interprets the disputed limitation as requiring that the heat treated seal coating layer “is formed on the sealing ridge and specifically formed on top and on inner and outer side surfaces *of the ridge* and not on the top surface . . . of the carrier” (Ans. 27) (emphasis added). The Examiner acknowledges that the Specification describes spraying a seal coating over the entirety of a carrier top surface having elevated edges and, thereafter, heat treating the seal coating, but “[t]here are no specifics regarding where the coating is on the edges/sealing ridge” (*id.* at 28 (citing Spec. ¶ 44)).

Appellant argues that the Specification’s description of a seal coating sprayed specifically over a sealing ridge “discloses a first embodiment where the seal coating is a heat treated coating that is not on portions of the top surface of the carrier *exposed by the sealing ridge*” (Appeal Br. 8 (citing Spec. ¶ 44)) (emphasis added).

For words of exclusion in a negative limitation to not render a claim indefinite, the excluding words must have a reasonably precise meaning. *In re Wakefield*, 422 F.2d 897, 904 (CCPA 1970); *see also In re Barr*, 444 F.2d 588, 595 (CCPA 1971) (holding that when “the boundaries of the patent protection sought are set forth definitely, albeit negatively, . . . [the] claim complies with the second paragraph of 112”); MPEP § 2173.05(i).

Claim 1 is directed to a substrate carrier comprising, *inter alia*, a “sealing ridge[, which] further comprises a . . . heat treated seal coating not on portions of the top surface exposed by the sealing ridge.” Thus, claim 1 excludes from within its scope a heat treated seal coating, which is located on “portions of the top surface exposed by the sealing ridge” (claim 1). However, the location of these “exposed” top surface portions in relation to

the sealing ridge is not clear. The term “exposed” requires that the referred to top surface portions are “open to view” and “not shielded or protected” (*see* MERRIAM-WEBSTER’S DICTIONARY (August 13, 2020), <https://www.merriam-webster.com/dictionary/exposed>).

The disputed negative limitation may be interpreted to encompass a heat treated coating, which is not on open and unshielded portions of the carrier’s top surface adjacent, next to, and “*by* the sealing ridge” (claim 1) (emphasis added). However, it is unclear how seal coating is sprayed specifically over the sealing ridge’s top, inner, and outer side surfaces, but not onto the top surface’s portions, which are adjacent and next to the sealing ridge (*see, e.g.*, Spec. ¶ 44).

The negative limitation may alternatively be interpreted as encompassing a heat treated coating, which is not on open and unshielded portions of the carrier’s top surface that the sealing ridge has exposed. It is, however, unclear how the sealing ridge actively *exposes* the top surface’s uncoated portions when these portions are covered, not viewable, and shielded by the sealing ridge (*see* MERRIAM-WEBSTER’S DICTIONARY (August 13, 2020), <https://www.merriam-webster.com/dictionary/exposed>).²

Therefore, claim 1 as drafted is indefinite as the negative limitation “the heat treated seal coating not on portions of the top surface exposed by the sealing ridge” is unreasonably imprecise.

² In yet another alternative interpretation, we note that the Specification’s Figures 4 and 5a depict a portion of the carrier’s top surface 416 in contact and *exposed to* circumferential sealing ridge 408. The spray coating method described in the Specification would not coat the area of top surface 416 in contact with ridge 408 (*see* Spec. ¶ 44).

Claim 18 suffers from the same issue as claim 1. Claim 18 is directed to a system comprising, *inter alia*, a “sealing ridge[, which] further comprises a . . . heat treated seal coating not on portions of the top surface of the carrier exposed by the sealing ridge.” As with claim 1, it is unclear whether the claim encompasses a heat treated coating, which is not on: (i) open and unshielded portions of the carrier’s top surface adjacent, next to, and “by the sealing ridge,” (claim 18) (emphasis added) or (ii) uncoated portions of the top surface, which the sealing ridge somehow *exposes*.

We find that claims 1–5, 7–12, 16, and 18–22 are indefinite and enter a new ground of rejection under 35 U.S.C. § 112(b) for the reasons discussed above. Because the Examiner’s rejections are based upon a speculative meaning as to the claims, we *pro forma* reverse the Examiner’s § 112(a) and § 103 rejections over Shiraiwa, Vartabedian, Shih, Lin, Shimizu, Stevens, Ke, McCutcheon, Burggraf, Flaim, Landesberger, and Zhang. *In re Steele*, 305 F.2d 859, 863 (CCPA 1962).

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed	New Ground
1, 18	112(a)	Written Description		1, 18	
1, 11, 22	103	Shiraiwa, Vartabedian, Shih		1, 11, 22	
2–5	103	Shiraiwa, Vartabedian, Shih, Lin		2–5	

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed	New Ground
18	103	Shimizu, Stevens, Ke, Shiraiwa, Vartabedian, Shih		18	
1-5, 7-10, 12, 16	103	McCutcheon, Burggraf, Flaim		1-5, 7-10, 12, 16	
11	103	McCutcheon, Burggraf, Flaim, Landesberger		11	
21	103	McCutcheon, Burggraf, Flaim, Zhang		21	
18-20	103	Shimizu, Stevens, Ke, McCutcheon, Burggraf, Flaim		18-20	
1-5, 7-12, 16, 18-22	112(b)	Indefiniteness			1-5, 7-12, 16, 18-22
Overall Outcome				1-5, 7-12, 16, 18-22	1-5, 7-12, 16, 18-22

This decision contains a NEW GROUND OF REJECTION pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.” Section 41.50(b) also provides:

When the Board enters such a non-final decision, the appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new Evidence relating

to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the prosecution will be remanded to the examiner. The new ground of rejection is binding upon the examiner unless an amendment or new Evidence not previously of Record is made which, in the opinion of the examiner, overcomes the new ground of rejection designated in the decision. Should the examiner reject the claims, appellant may again appeal to the Board pursuant to this subpart.

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

REVERSED; 37 C.F.R. § 41.50(b)