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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARK LOBODA

Appeal 2015-008317
Application 13/963,989
Technology Center 1700

Before KAREN M. HASTINGS, GEORGE C. BEST, and
N. WHITNEY WILSON, *Administrative Patent Judges*.

WILSON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134 from the September 11, 2014 decision of the Examiner finally rejecting claims 1–7 and 27–29. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We affirm.

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[1] Appellant identifies the real party in interest as Dow Corning Corporation (Br. 3).

CLAIMED SUBJECT MATTER

Appellant's invention is directed to a method for growing a silicon carbide crystalline semiconductor material by vapor deposition onto a seed crystal, which is provided on a supporting shelf (Spec. ¶¶ 3, 27, 28; Title). Independent claim 1 is representative of the claims on appeal, and is reproduced below from the Claims Appendix to the Brief (*key claim limitations shown in italics*):

1. A method of forming an SiC crystal, the method comprising:

a. *placing a seed crystal on a shelf of an insulated graphite container and preventing an exposed back surface of the seed from contacting the ceiling thereby defining a volume between ceiling of the graphite container and the exposed back surface of the seed, and wherein an internal diameter of the graphite container at the shelf is sufficiently large to allow for thermal expansion of the seed*;

b. placing a source of silicon and carbon atoms in the insulated graphite container, wherein the source of silicon and carbon atoms is for transport to the seed crystal to grow the SiC crystal;

c. placing the graphite container inside a furnace;

d. evacuating the furnace and filling with inert gas to a pressure above 600 [T]orr;

e. heating the furnace to a temperature from about 2,000°C to about 2,500°C; and,

f. evacuating the induction furnace to a pressure of from about 0.1 Torr to about 100 Torr, *while directing gas flow from below the seed crystal through a periphery of the seed crystal and to a center of the volume between ceiling of the graphite container and the back surface of the seed, to thereby facilitate vapor transport from the source of silicon and carbon atoms to the seed while preventing the back surface of the seed from contacting the ceiling.*

(Br. 17; Claims App.)

REJECTIONS

(1) Claims 1–7 are provisionally rejected on the grounds of nonstatutory obviousness-type double patenting (OTDP) over claims 1–4 and 6–9 of copending Application No. 14/058,167 (hereinafter "the '167 Application").

(2) Claims 1, 2, and 27–29 are rejected under 35 U.S.C. § 103(a) as unpatentable over Fujimoto[2] in view of Kondo.[3]

(3) Claim 3 is rejected under 35 U.S.C. § 103(a) as unpatentable over Fujimoto in view of Kondo, and further in view of Kinoshita.[4]

(4) Claim 4 is rejected under 35 U.S.C. § 103(a) as unpatentable over Fujimoto in view of Kondo, and further in view of Kinoshita and Leonard.[5]

(5) Claim 5 is rejected under 35 U.S.C. § 103(a) as unpatentable over Fujimoto in view of Kondo, and further in view of Vodakov.[6]

We exercise our discretion not to review the Examiner's provisional rejection of claims 1–7 for OTDP. *See Ex parte Jerge*, 2012 WL 1375142 at *3 (BPAI 2012) (informative) ("Panels have the flexibility to reach or not reach provisional obviousness-type double-patenting rejections." (citing *Ex parte Moncla*, 95 USPQ2d 1884 (BPAI 2010) (precedential))). While we do not affirm the Examiner's provisional OTDP rejection, should any claims issue from the '167 Application, the Examiner remains free to assert a non-provisional OTDP rejection based on any such issued claims.

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[2] Fujimoto et al., U.S. Patent Pub. No. 2010/0080956 A1, published Apr. 1, 2010.
[3] Kondo et al., U.S. Patent Pub. No. 2002/0083892 A1, published July 4, 2002.
[4] Kinoshita et al., U.S. Patent Pub. No. 2007/0176531 A1, published Aug. 2, 2007.
[5] Leonard et al., U.S. Patent Pub. No. 2008/0008641 A1, published Jan. 10, 2008.
[6] Vodakov et al., U.S. Patent No. 6,534,026 B2, issued Mar. 18, 2003.

Appellant does not make separate substantive arguments in support of patentability of any of the claims (*see generally* Br. 10–16). Accordingly, our discussion will focus on the obviousness rejection of independent claim 1.

DISCUSSION

The Examiner finds that Fujimoto's method of forming an SiC crystal teaches the elements of the claimed method except that

> Fujimoto does not explicitly teach that the seed crystal is placed on a shelf of the insulated graphite container such that a volume in a back surface of the seed is defined, the exposed back surface of the seed is prevented from contacting the ceiling, *the internal diameter of the graphite container at the shelf is sufficiently large to allow for thermal expansion of the seed*, and that *gas flow is directed from below the seed crystal through a periphery of the seed crystal and to a center of the volume between ceiling of the graphite container and the back surface of the seed*, to thereby prevent the back surface of the seed from contacting the ceiling.

(Final Act. 8 (emphasis added)). The Examiner finds, however, that Kondo teaches "an embodiment of a seed holder wherein three hook-shaped members (7) are utilized to support a hexagonal-shaped seed crystal (3) at three corners such that a volume is defined between a back surface of the seed (3) and the lid member (1c)" (Ans. 9 (citing Kondo Figs. 3A–B; ¶¶ 51–53)). The Examiner further finds that "unconstrained corners of the seed crystal (3) are free to expand as a result of thermal expansion" (Ans. 9 (*see* Kondo Fig. 3B)) and that Kondo's Figures 6A–B suggest that

> The higher pressure within the crucible main body (1a) as compared to the empty volume located above the seed crystal (3) will necessarily lead to at least some Si and C species being directed to flow from below the seed crystal, around its

> periphery, and to a center of the volume between the seed and the ceiling of the lid.

(Ans. 9). Likewise, with respect to Kondo's Figures 3A–B, the Examiner concludes these figures similarly "read upon the corresponding limitations recited in claim 1" (Ans. 10). The Examiner further finds that Figures 6A–B suggest that seed (3) is able to move freely in the horizontal direction during thermal expansion, unhindered by the internal diameter of shelf (1d), because the two halves of lid (1b) are pressed together (Final Act. 8, citing Kondo Figs. 6A–B; ¶¶ 60–63).

Appellant makes the following principal arguments urging reversal of Rejection (2): (a) in the applied prior art, the seed is attached to the lid, but claim 1 requires that the seed is attached to a shelf within the graphite container (Br. 10–13); (b) the two halves of lid (1b) as found in Kondo's Figures 6A–B do not and should not separate during the crystal growth process to avoid undesirable flow of Si and C source material therebetween (*id.* at 11–15); and (c) the applied prior art teaches away from the limitation "directing gas flow from below the seed crystal through a periphery of the seed crystal and to a center of the volume between ceiling of the graphite container and the back surface of the seed" recited in claim 1 (*id.* at 15–16). Appellant's arguments are not persuasive.

With regard to argument (a), the Examiner interprets the limitation "a shelf of an insulated graphite container" to merely require that the shelf is present within the graphite container, rather than an extension of the graphite container itself (Ans. 4). The Examiner then provides a detailed and supported explanation of why the claim, as so interpreted, reads on the cited art (*id.*). Appellant does not challenge these findings. We determine that, based on the preponderance of the evidence of record, Appellant has not

shown reversible error in the Examiner's interpretation of the term at issue in claim 1.

Regarding argument (b), Appellant's assertions are incomplete because they do not address all of the Examiner's findings with respect to Kondo's teachings (*see, e.g.*, Ans. 4, 9). Even assuming that the Examiner's findings with respect to Kondo's Figures 6A–B are inaccurate, the Examiner has provided a detailed explanation of why a person of skill in the art would have identified Kondo's teachings in Figures 3A–B as beneficial and would have been motivated to use three hook-shaped members to support a hexagonal-shaped seed crystal at three corners (Ans. 4, 9). Appellant has not persuasively refuted the Examiner's explanation of why the combination of references would have been obvious, particularly with respect to Kondo's teachings in Figures 3A–B. Thus, we are not persuaded by Appellant's argument (b).

With respect to Appellant's argument (c), whether a reference teaches away from a claimed invention is a question of fact. *In re Harris*, 409 F.3d 1339, 1341 (Fed. Cir. 2005). For a reference to "teach away," it must criticize, discredit, or otherwise discourage the claimed solution. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

In this instance, Appellant's arguments are not persuasive because they fail to identify any teaching in the applied prior art that criticizes, discredits, or discourages "directing gas flow from below the seed crystal through a periphery of the seed crystal and to a center of the volume between ceiling of the graphite container and the back surface of the seed" as claimed. Implementation of Kondo's three hook-shaped members to support a hexagonal-shaped seed crystal at three corners, as the Examiner

finds (Ans. 9), would have facilitated a method of forming an SiC crystal in which at least some Si and C species are directed to flow from below the seed crystal, around its periphery, and to a center of the volume between the seed and the ceiling of the lid. Thus, Appellant's argument (c) is not persuasive.

Accordingly, we determine that Appellant has not shown reversible error in the obviousness rejection over Fujimoto and Kondo, and we affirm Rejection (2). Moreover, as Appellant has not offered separate substantive arguments regarding error in the rejections of dependent claims 3, 4, and 5 (Br. 16), we also affirm Rejections (3), (4), and (5).

CONCLUSION

We AFFIRM the rejection of claims 1, 2, and 27–29 under 35 U.S.C. § 103(a) as unpatentable over Fujimoto in view of Kondo.

We AFFIRM the rejection of claim 3 under 35 U.S.C. § 103(a) as unpatentable over Fujimoto in view of Kondo, and further in view of Kinoshita.

We AFFIRM the rejection of claim 4 under 35 U.S.C. § 103(a) as unpatentable over Fujimoto in view of Kondo, Kinoshita, and further in view of Leonard.

We AFFIRM the rejection of claim 5 under 35 U.S.C. § 103(a) as unpatentable over Fujimoto in view of Kondo, and further view of Vodakov.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED