

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MOHAMED H. KHAN,
JAMES A. COLE, and JOEL A. TAUBE

Appeal 2007-2986
Application 10/223,998
Technology Center 1700

Decided: January 31, 2008

Before CHARLES F. WARREN, PETER F. KRATZ, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claims 1 through 12 in the Office Action mailed October 18, 2005. Subsequently, Applicants amended claim 12 and the Examiner allowed the claim, leaving claims 1 through 11 for our

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consideration. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2005).

The appeal was heard December 20, 2007.

We reverse the decision of the Primary Examiner.

Claim 1 illustrates Appellants' invention of a method for producing nano-particles from a precursor material, and is representative of the claims on appeal:

1. A method for producing nano-particles from a precursor material comprising:

vaporizing the precursor material to produce a vapor;

directing said vapor into an isolation chamber;

contacting said vapor contained in said isolation chamber with a quench fluid stream, said quench fluid stream cooling said vapor to produce the nano-particles; and

removing said nano-particles from said isolation chamber.

The Examiner relies upon the evidence in these references (Ans. 3):

| | | |
|---------|--------------|---------------|
| Johnson | US 5,665,277 | Sep. 9, 1997 |
| Pirzada | US 5,851,507 | Dec. 22, 1998 |
| Parker | US 5,874,684 | Feb. 23, 1999 |

Appellants request review of the ground of rejection under 35 U.S.C. § 103(a) advanced on appeal (App. Br. 10):

Claims 1 through 7 and 9 through 11 as unpatentable over Parker (Ans. 3);

Claims 1 through 6 and 9 through 11 as unpatentable over Johnson (Ans. 3);

Claim 8 as unpatentable over Parker as applied to claims 1 through 7 and 9 through 11 (Ans. 4); and

Claims 7 and 8 as unpatentable over Johnson as applied to claims 1 through 6 and 9 through 11 (Ans. 4).

Appellants argue the claims in the first, second and fourth grounds of rejection as a group. App. Br. 15-26. Thus, we decide this appeal based on claims 1 and 8. 37 C.F.R. § 41.37(c)(1)(vii) (2005).

The issues in this appeal are whether the Examiner has carried the burden of establishing a *prima facie* case in each of the grounds of rejection advanced on appeal.

The issues in this appeal entail the interpretation of the second and third clauses of claim 1, on which claim 8 depends, by giving the terms of claim 1 the broadest reasonable interpretation in their ordinary usage in context as they would be understood by one of ordinary skill in the art, in light of the written description in the Specification unless another meaning is intended by Appellants as established therein, and without reading into the claim any disclosed limitation or particular embodiment. *See, e.g., In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004); *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000); *In re Morris*, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989).

The plain language of claim 1, with reference to Specification Figs. 1 and 2, specifies vaporizing precursor material 14 to produce vapor 36; *directing* vapor 36 *into isolation chamber* 28; contacting vapor 36 in isolation chamber 28 with quench fluid stream 34 to produce nano-particles 12 in chamber 28; and removing nano-particles 12 from isolation chamber 28. *See Spec., e.g., 24:22-26:14.* Appellants emphasize, with reference to Specification Figs. 1 and 2, “claim 1 requires that the precursor material 12 [sic 14] first be vaporized in one location, vapor region 18, and then directed into another location, isolation chamber 28,” wherein “[i]solation chamber

28 isolates the vaporized precursor material 36 from the vapor region 18.”

Reply Br. 2, citing Spec. 25:29-26:1.

We agree with Appellants that the disclosure in the Specification makes clear that the language of the second and third clauses of claim 1 have the plain meaning of directing a vapor into an isolation chamber in which the vapor is further processed into nano-particles with a quench fluid stream. We emphasize that in reaching this determination, we have not read specific embodiments disclosed in the Specification into claim 1 as limitations. *See, e.g., Zletz, 893 F.2d at 322.*

Considering now the primary references, Parker and Johnson, we find Parker would have disclosed to one of ordinary skill in this art a method employing the apparatus illustrated in Fig. 1, in which, in chamber 14, precursor 12, electrically grounded by anode 28, is vaporized by arc energy from nonconsumable electrode 20, wherein the electrode is shielded by gas 22 which forms a plasma having elongated plasma tail flame 30. “The plasma tail flame 30 acts as a high temperature gradient furnace into which the vaporized precursor material 12 is injected along with a quench . . . gas 32 . . . through nozzle 35” to form nanocrystals that are carried out of chamber 14 and through nozzle 42 by gas 44. Parker, e.g., col. 3, ll. 1-31, and col. 4, ll. 29-40.

We find Johnson would have disclosed to one of ordinary skill in this art a method employing the apparatus illustrated in Figs. 1A-B, in which, in chamber 10, material M is evaporated in crucible 12, that contains an anode which with nonconsumable electrode 14, forms a plasma vapor plume from gas introduced at inlet 17. “A gaseous jet nozzle or other discharge device

15 . . . [directs] a gaseous quenching jet . . . through the vapor plume . . . to quench it so as to nucleate and grow nanoparticles from the vapor and carry them" through flow restriction orifice or opening 30 that is disposed between the first chamber 10 and intermediate chamber 40. Johnson, e.g., col. 5, l. 11 to col. 6, l. 51.

We fail to find in Parker and in Johnson convincing evidence supporting the Examiner's position that each of these references would have disclosed to one of ordinary skill in this art methods meeting the limitations of the second and third clauses of claim 1. Indeed, in both references, the nano-particles are formed in the confluence of the vaporized precursor material and the quench fluid stream in the plasma tail flame or plasma vapor plume, all in the same chamber, and the resulting nano-particles are then directed into another chamber. Thus, the methods taught by each of Parker and Johnson do not meet the limitations of claim 1 as we have interpreted this claim above. The Examiner has not advanced any reason why one of ordinary skill in this art would have modified these teachings to arrive at the claimed method.

A discussion of Pirzada is not necessary to our decision.

Accordingly, in the absence of a *prima facie* case of obviousness in any of the grounds of rejection based on each of Parker and Johnson, we reverse the grounds of rejection under 35 U.S.C. § 103(a).

The Primary Examiner's decision is reversed.

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REVERSED

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