

[2004 Pat. App. LEXIS 537](#)

Board of Patent Appeals and Interferences

September 30, 2004, Decided

Appeal No. 2004-2192; Application 09/414,520

Reporter

2004 Pat. App. LEXIS 537

**Ex parte KAZUE TAKAHASHI, TOSHIO MASUDA, TETSUNORI KAJI, and
KEN'ETSU YOKOGAWA**

Notice:

[*1]

ROUTINE OPINION. Pursuant to the Patent Trial and Appeal Board Standard Operating Procedure 2, the opinion below has been designated a routine opinion.10:

Core Terms

plasma, apparatus, fluorine, carbon, patent, vacuum, rejected claim, species, temperature, chamber, etch, set forth, unpatentable, gases

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Panel: ON BRIEF Before TIMM, JEFFREY T. SMITH, and PAWLIKOWSKI, Administrative Patent Judges.

Opinion By: BEVERLY A. PAWLIKOWSKI

Opinion

PAWLIKOWSKI, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 2, 4-7, 9, and 10.

A copy of each of these claims is set forth in the attached appendix.

On page 6 of the brief, appellants state that the claims do not stand or fall together. To the extent any one claim is argued separately for patentability, we will consider such claim in this appeal.

The examiner relies upon the following references as evidence of unpatentability:

Ovshinsky et al. (Ovshinsky)

5,324,553

Jun. 28, 1994

Claims 1, 2, and 5 stand rejected under 35 U.S.C. § 103 [*2] as being unpatentable over Satou in view of Ovshinsky.

Claims 4, 6, 7, 9, and 10 stand rejected under 35 U.S.C. § 103 as being unpatentable over Satou and Ovshinsky and further in view of Akahori.

OPINION

I. The rejection of claims 1, 2, and 5 under 35 U.S.C. § 103 as being obvious over Satou in view of Ovshinsky

On page 3 of the answer, the examiner refers to Paper No. 18 regarding his position for this rejection. In Paper No. 18, the examiner's position is set forth on pages 2-4.

Beginning on page 6 of the brief, appellants rebut the examiner's position. Appellants submit that the rejection is in error, *inter alia*, because the subject matter regarding the gas species, i.e., carbon and fluorine, is not set forth in the combination of references.

We agree with appellants that neither Satou nor Ovshinsky teach a gas species that contains carbon and fluorine. However, claim 1 is an apparatus claim (as well as claims 2, 4, and 5). As such, we note that a claim recitation with respect to the material [*3] intended to be worked upon by the claimed apparatus, does not impose structural limitations upon the claimed apparatus, which differentiates it from a prior art apparatus satisfying the structural limitations of that claimed. See *Ex parte Masham*, 2 USPO2d 1647, 1648 (Bd. Pat. App. & Int. 1987). Also see *In re Rishoi*, 197 F.2d 342, 344, 94 USPO 71, 72 (CCPA 1952); and *In re Young*, 75 F.2d 996, 997, 25 USPO 69, 70 (CCPA 1935). Similarly, a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of that claimed. See *Ex parte Masham*, 2 USPO 1647, 1648 (Bd. Pat. App. & Int. 1987). Also see *In re Yanush*, 477 F.2d 958, 959, 177 USPO 705, 706 (CCPA 1973); *In re Finsterwalder*, 436 F.2d 1028, 1032, 168 USPO 530, 534 (CCPA 1971); *In re Casey*, 370 F.2d 576, 580, 152 USPO 235, 238 (CCPA 1967); [*4] and *In re Otto*, 312 F.2d 937, 939, 136 USPO 458, 459 (CCPA 1963).

In the instant case, as pointed out by the examiner at the bottom of page 4 of the answer, the prior art structure meets the claims because the prior art apparatus is capable of performing the intended use. Appellants do not provide arguments showing that it is not capable of such.

In view of the above, we affirm the rejection of claims 1, 2, and 5 under 35 U.S.C. § 103 as being unpatentable over Satou in view of Ovshinsky.

II. The 35 U.S.C. § 103 rejection of claims 4, 6, 7, 9, and 10 as being unpatentable over Satou and Ovshinsky and further in view of Akahori

We refer to page 4 of Paper No. 18 regarding the examiner's position in this rejection.

On page 8 of the brief, appellants argue that Ovshinsky relates to a method for the improved microwave deposition of thin films. The method does not relate to a plasma etching apparatus. The examiner rebuts and states that a recitation of intended use [*5] must result in a structural difference. Answer, page 6. We agree with the examiner, with regard to apparatus claim 4, and refer to our above comments in this regard. However, with regard to process claims 6, 7, 9, and 10, we do not agree with the examiner's position.

The issue is whether one skilled in the art would have been motivated to incorporate the teachings of Ovshinsky (directed to an improved chemical vapor deposition method) to modify the method for etching as set forth in Satou. We find that the examiner's position fails to explain why one of ordinary skill in the art would have selected the frequency used in the PECVD method of Ovshinsky, involving different precursor gases than Satou, in the etching method of Satou, which involves different precursor gases than Ovshinsky. Satou is directed to etching, and uses gases such as BC11 and Cl2, whereas Ovshinsky is directed to depositing materials using gases as set forth in claim 17, in column 20, of Ovshinsky.

Also, the examiner relies upon Akahori for teaching plasma generation by ECR, including carbon and fluorine species, and for the use of intermittent microwave application. However, the examiner does not explain why [*6] one of ordinary skill in the art would have used the precursor gases of Akahori in the process of Satou.

Because the examiner has not provided an explanation as discussed above, we determine that the examiner has not met his burden of setting forth a prima facie case of obviousness with regard to the process claims.

In view of the above, we reverse the 35 U.S.C. § 103 rejection of claims 6, 7, 9 and 10.

III. Other Issues

Upon return of this application to the jurisdiction of the examiner, consider whether claim 10 complies with the requirements of 35 U.S.C. § 112, second paragraph.

Also, consider Japanese application patent laid-open publication No. Hei 8-300039, discussed on page 9 of appellants' specification, with regard to the patentability of the claimed invention.

IV. Conclusion

The rejection of claims 1, 2, 4, and 5 is affirmed.

The rejection of claims 6, 7, 9, and 10 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under [37 CFR § 1.136\(a\)\(1\)\(iv\)](#) [*7] (effective Sept. 13, 2003; [69 Fed. Reg. 49960](#) (Aug. 12, 2004); 1286 Off. Gaz. Pat., Office 21 (Sept. 7, 2004)).

AIFRMED-IN-PART

Catherine Timm

Administrative Patent Judge

Jeffrey T. Smith

Administrative Patent Judge

Beverly A. Pawlikowski

Administrative Patent Judge

BOARD OF PATENT APPEALS AND INTERFERENCES

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APPENDIX

1. In a plasma processing apparatus for etching an electrically insulating film, the plasma processing apparatus having a vacuum processing chamber, a sample table for mounting a sample which is processed in said vacuum processing chamber, and a plasma generation means, wherein a plasma processing is carried out by generating a plasma in response to introduction of a gas which contains at least carbon and fluorine, and a gas species is generated which contains carbon and

plasma generation means comprising an electron cyclotron resonance system in which a microwave [*8] is provided having a frequency of from 300 MHz to 1 GHz and which generates a plasma in which the degree of plasma dissociation is an intermediate degree and said gas species containing carbon and fluorine is generated fully in the plasma, and a temperature of a region which forms a side wall of said vacuum processing chamber is controlled to have a range of 10[degree]C to 120[degree]C and wherein the sample for etching by the plasma is an insulating film.

2. A plasma processing apparatus according to Claim 1, wherein

said plasma generation means is a source of plasma in which an electron energy is in a range of from 0.25 eV to 1 eV.

4. A plasma processing apparatus according to claim 1, wherein in said plasma generation means, a drive of a plasma exciting power supply is carried out intermittently.

5. A plasma processing apparatus according to any one of Claim 1, Claim 2 or Claim 4, wherein as a means for adjusting a temperature of said vacuum wall, a temperature adjusted coolant medium is used.

6. In a plasma processing method using a vacuum processing chamber, a sample table for mounting a sample which is processed in said vacuum processing chamber wherein the sample is [*9] an electrically insulating film, and a plasma generation means, wherein a plasma processing is carried out by generating a plasma in response to introduction of a gas which contains at least carbon and fluorine, and a gas species is generated which contains a carbon and fluorine according to a plasma dissociation, the plasma processing method comprising the steps of:

generating a plasma, wherein said plasma generation is effected using an electron cyclotron resonance system in which a microwave having a frequency of from 300 MHz to 1 GHz is employed and wherein a degree of plasma dissociation is an intermediate degree and said gas species containing carbon and fluorine is generated fully in the plasma, and controlling a temperature of a region which forms a side wall of said vacuum processing chamber to have a range of 10[degree]C to 120[degree]C.

7. A plasma processing method according to claim 6, wherein said plasma generation produces a plasma in which an electron energy is a range of from 0.25 eV to 1 eV.

9. A plasma processing method according to claim 6, wherein in said plasma generation, a drive of a plasma exciting power supply is carried out intermittently.

10. A plasma [*10] processing apparatus according to Claim 6, Claim 7 or Claim 9 wherein as a means for adjusting a temperature of said vacuum wall, a temperature adjusted coolant medium is used.

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