

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte
ANANTHA SUBRAMANI,
ASHOK K, DAS,
LEIF E. DELAURENTIS, and
MICHAEL ROSENSTEIN

Appeal No. 2001-2181
Application No. 08/862,537

ON BRIEF

Before LIEBERMAN, JEFFREY T. SMITH and POTEATE, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

THE INVENTION

The invention is directed to a wafer processing system. The process occurs in a high density plasma vacuum chamber. The chamber contains an aluminum deposition shield. In one embodiment the aluminum deposition shield is described in terms of physical shape and as having various thicknesses. Additional limitations are described in the following illustrative claims.

THE CLAIM

Claims 1 and 5 are illustrative of appellants' invention and are reproduced below.

1. A wafer processing system, comprising:
 - a high density plasma vacuum processing chamber;
 - an aluminum deposition shield disposed within the vacuum chamber and adapted to cool a heat source; and
 - a heat source positioned to radiate heat to be dissipated by the deposition shield.
5. The wafer processing system of claim 1 wherein the aluminum deposition shield comprises:
 - i) an outer cylindrical portion surrounding the heat source, the outer cylindrical

THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references:

Nihei et al. (Nihei)	4,999,096	Mar. 12, 1991
Barnes et al. (Barnes)	5,178,739	Jan. 12, 1993
Raaijmakers	5,419,029	May 30, 1995
Mintz	5,391,275	Feb. 21, 1995
Xu	5,639,357	Jun. 17, 1997

THE REJECTIONS

Claims 7, 8, 14, 15 and 20 stand rejected under 35 U. S. C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claims 1 through 4, 9 through 13, and 16 through 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Raaijmakers in view of Xu, Barnes or Nihei.

Claims 5 through 8, 14, 15 and 20 stand rejected under 35 U.S.C. §103(a) as

OPINION

We have carefully considered all of the arguments advanced by the appellants and the examiner and agree with the appellants that the rejection of the claims under §§103(a) and 112 are not well founded. Accordingly, we reverse these rejections.

The Rejection under § 112

It is well settled that a specification complies with the 35 U.S.C. § 112, first paragraph, written description requirement if it conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, the inventor was in possession of the invention. See Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991); In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983); In re Edwards, 568 F.2d 1349, 1351-52, 196 USPQ 465, 467 (CCPA 1978); In re Wertheim, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976).

It is the examiner's position that the shape of the shield and the varying thicknesses

2 which shows thicknesses' T1, T2 and T3 corresponding to different portions of the shield. Although the examiner has argued that the specification does not identify which thicknesses correspond to which parts of the shield, Answer, page 7, we conclude that the person of ordinary skill in the art would readily correlate the thicknesses T1, T2 and T3 with the respective parts of the shield. Our position is supported by reference to Figures 1 and 2 that the thin inner cylindrical portion corresponds to T3. Moreover the drawings alone may provide written description support for the claimed invention. See Vas-Cath, Inc. v. Mahurkar 935 F.2d 1555, 1563-65, 19 USPQ2d 1111, 1118 (Fed. Cir. 1991);

Ipsis verbis disclosure is not necessary to satisfy the written description requirement of 35 U.S.C. § 112. The disclosure need only reasonably convey to those of ordinary skill in the art that the inventors had possession of the subject matter in question.

Fuijikawa v. Wattanasin, 93 F.3d 1559, 1570, 39 USPQ2d 1895, 1904 (Fed. Cir. 1996). We agree with the appellants that the disclosure reasonably conveys to one of ordinary skill in the art that appellants, did in fact disclose the various thicknesses present in the aluminum deposition shield and thus had possession of the subject matter on appeal

ground, of presenting a *prima facie* case of unpatentability." See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The examiner relies upon three separate rejections encompassing five references to reject the claimed subject matter and establish a prima facie case of obviousness.

In the first instance, it is the examiner's position that, it would have been obvious to modify the Raaijmakers reference to include a RF coil because the RF coil generates a high density plasma. We disagree. Raaijmakers is directed to thin film deposition and etch process such as PVD (physical vapor deposition) or sputtering. We find that a shield constructed of aluminum is mounted to the chamber. See column 1, lines 24. We find that the chamber inner wall being in contact with the aluminum shield forms a heat sink for the shield. See column 4, lines 5-7 and 14-16. There is however, no disclosure of a high density plasma vacuum processing chamber as required by the claimed subject matter.

The examiner accordingly relies upon a trio of secondary references which disclose vacuum chambers having RF coils. The examiner thereafter combines the references with Raaijmakers "because the RF coil generates a high density plasma." See Answer, page 4. Even were the examiner's statement that RF coils generate high plasmas correct, it would

attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.").

Furthermore, on the record before us, we find no basis for the examiner's premise that the presence of RF coils necessarily results in a high density vacuum processing chamber. See Answer, pages 4 and 8. A careful reading of Barnes indicates that many factors affect the density of the plasma. The effect of magnets on plasma density is discussed at column 4, line 29, column 5, lines 22-26, 44-46, and column 6, lines 30-33. The effect of changes in pressure on plasma density is disclosed at column 4, lines 51-56 and column 6, lines 54-56. The effect of voltage is disclosed at column 5, lines 1-5. Finally, the effect of power provided by RF power supply resulting in more even plasma distribution throughout the vacuum chamber is discussed at column 4, lines 35-40. Accordingly, the presence of a RF coil is but one of many factors required to obtain a high density plasma. We conclude that the presence of a RF coil does not in and of itself necessarily result in a high density plasma as concluded by the examiner. In addition as each of Xu and Nihei are silent as to the presence of a high density plasma, it follows that

high density plasma in Mintz. Accordingly, it does not overcome the deficiencies of the underlying rejection.

We next turn to the rejection of each of the claims over Mintz in view of Xu, Nihei or Barnes. It is the examiner's position that the combination of references show every feature of the invention. "The motivation for such combination is discussed above." See Answer, page 7. In fact, however, the sole motivational statement present relates to the combination of Raaijmakers with Mintz. See Answer, page 6. In the absence of a reason to combine the references, the examiner has failed to establish a prima facie case of obviousness and the rejection is reversed.

DECISION

The rejection of claims 7, 8, 14, 15 and 20 under 35 U. S. C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention is reversed.

The rejection of claims 1 through 4, 9 through 13, and 16 through 19 under 35

and further in view of Mintz is reversed.

The rejection of claims 1 through 20 under 35 U.S.C. § 103(a) as being unpatentable over Mintz in view of Xu, Barnes or Nihei is reversed.

The decision of the examiner is reversed.

REVERSED

PAUL LIEBERMAN)
Administrative Patent Judge)
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Appeal No. 2001-2181
Application No. 08/862,537

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LINDA R. POTEATE
Administrative Patent Judge

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