

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.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 ALEXANDER D. LANTSMAN

Appeal No. 1997-0027
Application 08/117,443¹

HEARD: April 17, 2000

Before PAK, WARREN and WALTZ, Administrative Patent Judges.

PAK, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final
rejection of claims 9 through 15 and 23 through 37 which are

¹ Application for patent filed September 7, 1993.

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all of the claims pending in the application.

The subject matter on appeal is directed to a process and an apparatus for plasma processing a workpiece. Appellant has grouped the claims on appeal as follows(Brief, page 6):

Group I - Claims 9 through 15 (process claims); and
Group II - Claims 23 through 37 (apparatus claims).

Therefore, for purposes of this appeal, we will limit our discussion to the propriety of the examiner's rejections of claims 9 and 23 in accordance with 37 CFR § 1.192(c)(7) and (c)(8)(iv) (1995). Claims 9 and 23 are reproduced below:

9. A method of plasma processing a workpiece in a vacuum chamber having a cathode, comprising

evacuating said chamber,

elevating said cathode to a process initiation voltage relative to said chamber while said chamber is evacuated, said process initiation voltage being insufficient to fully ignite or maintain a plasma within said chamber,

flowing a gas into said chamber while maintaining said cathode at said process initiation voltage, and thereafter

applying electrical power to said cathode to elevate said cathode to a processing voltage greater than said process initiation voltage to fully ignite a plasma from said gas within said chamber and cause electrical current to flow through said plasma,

maintaining said cathode at said processing voltage to maintain ignition of a plasma in said chamber while processing said workpiece within said chamber.

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23. A plasma processing apparatus, comprising
a plasma processing vacuum chamber,
a cathode positioned within said chamber;
a power circuit for electrically driving said cathode,
said power circuit comprising
a primary power supply electrically coupled to said
cathode for electrically driving said cathode to a processing
voltage relative to said chamber to fully ignite a plasma
within said chamber and cause plasma processing,
a secondary power supply electrically coupled to said
cathode for applying a process initiation voltage relative
to said chamber to said cathode, said process initiation
voltage being smaller in magnitude than said processing
voltage and insufficient to fully ignite or maintain a plasma
within said chamber.

As evidence of obviousness, the examiner relies on the
following prior art:

Meacham et al. (Meacham)	4,557,819	Dec.
10, 1985		
Mashiro ²	59-222580	Dec. 14,
1984		
(Published Japanese Patent Application)		

² Our reference to this published Japanese Patent application is to its corresponding English translation of record.

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Claims 9 through 15, 23, 24, 27, 31 and 32 stand rejected under 35 U.S.C. § 103 as unpatentable over the disclosure of Mashiro. Claims 9 through 15 and 23 through 37 stand rejected

under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Mashiro and Meacham.³

We have carefully reviewed the specification, claims and applied prior art, including all of the arguments and evidence advanced by both the examiner and appellant in support of their respective positions. This review leads us to conclude that the examiner's § 103 rejections of the apparatus claims are well founded. Accordingly, we only affirm the examiner's decision rejecting apparatus claims 23, 24, 27, 31 and 32 under 35 U.S.C. § 103 over the disclosure of Mashiro and apparatus claims 23 through 37 under 35 U.S.C. § 103 over the

³ In the Answer, the examiner inadvertently fails to include the § 103 rejection of claims 9 through 15 and 23 through 37 over the combined disclosures of Mashiro and Meacham. However, it is clear from the examiner's final Office action (page 3), the body of the rejection in the Answer (pages 3 and 4), and appellant's Brief (page 6), such § 103 rejection has not been withdrawn.

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combined disclosures of Mashiro and Meacham. Our reasons for this determination follow.

We turn first to the examiner's rejections of process claims 9 through 15. We will not sustain these rejections for essentially those reasons expressed at pages 6 through 10 of the Brief. We only add that Mashiro does not teach, nor would have suggested, *inter alia*, elevating a cathode to a process initiation voltage which is "insufficient to fully ignite or maintain a plasma within said chamber" while a vacuum chamber having such cathode is evacuated. As correctly argued by appellant at pages 9 and 10 of the Brief, the examiner improperly read the voltage of the normal power supply in Mashiro as corresponding to the claimed process initiation voltage. The statement "[i]f the normal sputtering discharge should stop for any reason" in Mashiro does not indicate that the voltage of the normal power supply in Mashiro is insufficient at all times to fully ignite a plasma or maintain plasma within the vacuum chamber, i.e., a voltage insufficient to cause deposition, as required by claim 9. In other words, it is speculative to conclude that "stop for any reason" means "stop for an insufficient voltage". Moreover, we do not find

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any explanation on the part of the examiner as to why it would have been obvious to employ the claimed process initiation voltage in lieu of, or in addition to, the voltage of the normal power supply used to carry out the normal sputtering discharge. See Answer in its entirety. Nor do we find any finding on the part of the examiner as to how Meacham remedies the above deficiency. *Id.* The examiner simply fails to meet his burden of establishing a *prima facie* case of obviousness regarding the claimed process within the meaning of 35 U.S.C. § 103.

We turn next to the examiner's rejections of apparatus claims 23 through 37. As correctly found by the examiner at page 3 and 4 of the Answer, Mashiro discloses a plasma processing apparatus comprising (1) a plasma processing vacuum chamber, (2) a cathode positioned within the chamber, and (3) two power supplies coupled to the cathode. See also Mashiro, pages 3 and 4, together with Figures 1 and 2. We also find that it can be inferred from the disclosure of Mashiro that the power supplies described therein can be adjusted to produce a desired voltage for a given target material and a

given chamber dimension since they are said to be applicable to conventional sputtering devices involving a variety of target materials and a variety of vacuum chamber sizes. See page 5. In any event, the power supplies described in Mashiro are embraced by the claimed power supplies since the claimed processing and process initiation voltages produced in the claimed power supplies include those actual voltages produced by the power supplies described in Mashiro.⁴

Appellant argues that Mashiro does not teach or suggest the claimed primary and secondary power supplies for applying a processing voltage and a process initiation voltage, respectively. See Brief, pages 10-15. In other words, appellant takes the position that the functional limitations of his claim distinguish it over Mashiro. However, when, as here, the power supplies of Mashiro are capable of operating or performing the same function as the claimed power supplies

⁴ The claimed processing and process initiation voltages embrace any and all actual voltages since they are dependent on, *inter alia*, target materials, process gas and pressure, and chamber geometry. See specification, page 3.

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and are not shown to be structurally different than the claimed power supplies, the burden is on appellant to show that Mashiro's power supplies do not inherently possess the claimed functions. *In re Schreiber*, 128 F.3d 1473, 1478, 44 USPQ2d 1429, 1432 (Fed. Cir. 1997); *In re Casey*, 370 F.2d 576, 580, 152 USPQ 235, 238 (CCPA 1967). On this record, we find no evidence that appellant has profered any evidence to meet such burden. Accordingly, we affirm only the examiner's decision rejecting apparatus claims 23, 24, 27, 31 and 32 under 35 U.S.C. § 103 over Mashiro and apparatus claims 23 through 37 under 35 U.S.C. § 103 over Mashiro and Meacham.

The decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

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AFFIRMED-IN-PART

CHUNG K. PAK)	
Administrative Patent Judge)	
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CHARLES F. WARREN)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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