

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GLENN J. LEEDY

Appeal No. 1999-2834
Application No. 08/483,731

ON BRIEF

Before HAIRSTON, BARRETT, and FLEMING, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 99 through 104.

The disclosed invention relates to a lithographic pattern generation apparatus used in semiconductor processing.

Claim 99 is illustrative of the claimed invention, and it reads as follows:

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99. A semiconductor processing lithography apparatus for maskless pattern generation comprising:

an array of radiation source cells arranged in rows and columns, the array being formed on a flexible insulating membrane held in a support frame;

control logic mounted on the membrane for controlling the cells, wherein each cell comprises:

a source of radiation;

a target on which the radiation is incident for generating X-rays; and

an aperture for emitting the x-rays from the target onto a surface to be exposed.

No references were relied on by the examiner.

Claims 99 through 104 stand rejected under the first paragraph of 35 U.S.C. § 112 because of a nonenabling disclosure.

An excerpt from the grounds of the rejection is as follows

(answer, pages 3 and 4):

The emission of electrons from a cold cathode and their acceleration toward a target with sufficient energy to cause the generation of x rays requires the application of substantial potential difference between the cathode and the target. The manner of applying such potential and appropriately insulating the various components on the very thin membrane have not been taught.

The manner of creating and maintaining a vacuum within the very thin membrane to encompass the charged particle and x-ray generators has not been taught.

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Reference is made to the answer (paper number 24) for further detailed positions of the examiner, and to the briefs (paper numbers 23 and 25) for appellant's rebuttal to the examiner's rejection.

OPINION

Our reviewing court stated in In re Wright, 999 F.2d 1557, 1561-62, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993):

When rejecting a claim under the enablement requirement of section 112, the PTO bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by that claim is not adequately enabled by the description of the invention provided in the specification of the application; this includes, of course, providing sufficient reasons for doubting any assertions in the specification as to the scope of enablement. If the PTO meets this burden, the burden then shifts to the applicant to provide suitable proofs indicating that the specification is indeed enabling.

At the outset, we agree with the appellant (brief, pages 3 and 4) that claims 102 and 103 are directed to a disclosed embodiment of the invention that does not use x-rays, a cold cathode or a vacuum. For this reason, the lack of enablement rejection is reversed ab initio as to these claims.

Inasmuch as the disclosed and claimed invention is a replacement for the standard optical lithography integrated circuit mask, and is made from a heretofore relatively unknown

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process¹ referred to as Membrane Dielectric Isolation (MDI) (specification, pages 1 through 7, 9 through 29 and 61 through 76), we find that the examiner had a reasonable basis for questioning the efficacy of the disclosed and claimed invention.

In rebuttal to the examiner's "reasonable explanation," appellant has presented a declaration by Dr. Mark McCord, and a showing of related technology found in issued patents. The relevant excerpts from Dr. McCord's declaration are reproduced as follows:

5. The Office Action takes the position that a silicon membrane X-ray emitter array of the type claimed would not be feasible because of the inability to form or maintain an array of microminiature vacuum chambers in the silicon membrane. I respectfully disagree. Microminiature [sic, Microminiature] vacuum chambers have been previously reported in the technical literature by those skilled in the art of vacuum microelectric devices. These have been developed primarily for the fabrication of miniaturized vacuum tube devices using [sic, using] silicon micromachining techniques. The vacuum chambers are sealed by either bonding a cover over the cavity in vacuum, or evaporating metal over the cavity at an oblique angle to form a seal over the cavity. Subsequent operation of the devices has also been reported.

¹ Appellant has indicated (brief, page 3) that the disclosed and claimed lithography tool was "pioneered by the present inventor."

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6. One or both of the foregoing techniques would be applicable to forming a silicon membrane X-ray emitter array of the type claimed. Attached is an article describing one use of such a technique, Miniature Electron Microscope Without Vacuum Pumps, dated August 1998. Incidentally, the electron microscope described in this article produces significant X-ray emission from a specimen. Replacement of the electron-transparent isolation membrane in the figure with an X-ray target metal layer would result in an X-ray emitter of similar construction as that described in the application.

7. The Office Action takes the position that a silicon membrane particle-beam shutter array or aperture array of the type claimed would have unique power requirements (high voltage and/or current) beyond the level of ordinary skill in the relevant art at the time the application was filed. Again, I respectfully disagree. In general, electrostatic or magnetic deflection of charged particle beams does not require excessive voltages, currents or power. In particular, as the elements in the shutter array are miniaturized to the micrometer size range, electrostatic deflection voltage requirements are similarly reduced.

When the "suitable proofs" presented by appellant and declarant are weighed against the examiner's enablement concerns, we must give more weight to the credible showing made by appellant. Based upon the showing made by the appellant, the state of the art as represented by the submitted patents and the noted article, and the lack of any evidence in the record to buttress the examiner's concerns, we are of the opinion that the skilled artisan would be able to successfully replicate the

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claimed invention without undue experimentation. Thus, the lack of enablement rejection of claims 99 through 101 and 104 is likewise reversed.

DECISION

The decision of the examiner rejecting claims 99 through 104 under the first paragraph of 35 U.S.C. § 112 is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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MICHAEL R. FLEMING)	
Administrative Patent Judge)	

KWH:hh

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FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005-3315