

Applied Materials, INC

v.

Demaray LLC,

IPR2021-00103, -00104

U.S. Pat. Nos. 7,544,276 & 7,381,657

Patent Owner Demonstrative Exhibit

U.S. Patent 7,544,276

Patent No.: US 7,544,276 B2
Date of Patent: Jun. 9, 2009



'276

(12) **United States Patent**
Zhang et al.

(10) Patent No.: **US 7,544,276 B2**
(45) Date of Patent: **Jun. 9, 2009**

(54) **BIASED PULSE DC REACTIVE SPUTTERING OF OXIDE FILMS**

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(73) Assignee: SpringWorks, LLC, Minnetonka, MN (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 529 days.

(21) Appl. No.: 11/228,834

(22) Filed: Sep. 16, 2005

(65) **Prior Publication Data**
US 2005/0054495 A1 Mar. 16, 2005
Related U.S. Application Data

(62) Division of application No. 10/901,263, filed on Mar. 16, 2002, now Pat. No. 7,378,355.

(51) Int. Cl. C23C 24/24 (2006.01)

(52) U.S. Cl. 204/298.06; 204/298.05

(58) **Field of Classification Search**
204/298.06; 204/298.05
See application file for complete search history.

(56) **References Cited**

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(57) **ABSTRACT**

A biased pulse DC reactor for sputtering of oxide films is presented. The biased pulse DC reactor couples pulsed DC at a particular frequency to the target through a filter which filters out the effects of a bias power applied to the substrate, protecting the pulsed DC power supply. Films deposited utilizing the reactor have controllable internal properties such as the index of refraction. Optical components such as waveguide amplifiers and multiplexers can be fabricated using processes performed on a reactor according to the present invention.

13 Claims, 27 Drawing Sheets

BIASED PULSE DC REACTIVE SPUTTERING OF OXIDE FILMS

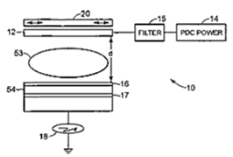
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Institution Decision: Petitioner's Burden

In an *inter partes* review, “the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.”

Harmonic Inc. v. Avid Tech., Inc., 815 F.3d 1356, 1363 (Fed. Cir. 2016)

(citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent

Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d

1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

Grounds Of Institution

Claims	References	Statutory Ground
'276, Claims 1-3, 6-8 '657, claims 2-4, 6, 8, 10-12, 21	Barber + Hirose or Barber + Hirose /Belkind	35 U.S.C. § 103(a)
Remaining claims	Barber + Hirose or Barber + Hirose /Belkind + tertiary references	35 U.S.C. § 103(a)

Barber and **Hirose** are bases for all grounds

Topics

Petitioner failed to establish Hirose as prior art

The state of the art did not teach or suggest the claimed combination

No reason to modify Barber as Petitioner argues

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