The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte D. MORGAN TENCH and JOHN T. WHITE

Appeal No. 2005-1680
Application No. 10/012,079

ON BRIEF

Before CAROFF, PAK and WARREN, Administrative Patent Judges.

CAROFF, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-23, all the pending claims in appellants' involved application.

All the appealed claims are directed to a cell assembly for electroplating a semiconductor wafer.

Claim 1, the broadest of three independent claims, is illustrative of the subject matter embraced by the claims on appeal:

1. A cell assembly for electroplating a semiconductor wafer using an electro plating solution, comprising:

an anode;

a cathode assembly for making electrical contact to the wafer and for holding the wafer in a substantially horizontal position;

a seal between the cathode assembly and the wafer to prevent the solution from intruding into the region of electrical contact between the cathode assembly and the wafer;

a cell wall; and

a passageway disposed around the periphery of the wafer, such that the electroplating solution, when forced through said passageway into the cell assembly, is caused to flow laminarly over the upper surface of the wafer, toward the center of the water, and then upward within said cell wall.

The prior art references applied by the examiner in rejecting the claims are:

Swanson	3,616,396	Oct. 26, 1971
Suitor et al. (Suitor)	4,885,142	Dec. 5, 1989
Starinshak et al. (Starinshak)	5,100,517	Mar. 31, 1992
Poris	5,256,274	Oct. 26, 1993
Brinket et al. (Brinket)	5,514,258	May 7, 1996
Kosaki et al. (Kosaki)	6,033,540	Mar. 7, 2000
Keigler	6,540,899	Apr. 1, 2003
Davis et al. (Davis)	6,579,430	Jun. 17, 2003

Additionally, the examiner refers to the following on page 11 of his Answer:

- Geankoplis, “Principles of Momentum Transfer and Overall Balances,” Transport Processes and Unit Operations, pp. 31 48-9 (Prentice Hall, 1993).

In response, appellants refer to the following two references on pages 3-4 of their reply brief:

- Bockris et al. (Bockris), Modern Electrochemistry, pp. 1058, 1070-71 (Plenum Press, Vol. 2, 1970).
- Gabe et al. (Gabe), “The rotating cylinder electrode: its continued development and application,” J. of App. Electrochemistry, pp. 759, 761 (Vol. 28, 1998).

The following six rejections are before us for review:

1. Claims 1, 10 and 12-19 stand rejected under 35 U.S.C. § 103(a) for obviousness in view of Kosaki taken in combination with Suitor and Brinket.

2. Claim 2 stands rejected on the same basis with additional reliance upon Poris.

3. Claims 3-4 stand rejected on the same basis as claims 1, 10 and 12-19, with additional reliance upon Swanson.

4. Claims 10-11 stand rejected on the same basis as claims 1, 10 and 12-19, with additional reliance upon Keigler.

5. Claims 20-21 stand rejected on the same basis as claims 1, 10 and 12-19, with additional reliance upon Starinshak.

6. Claims 5-9 and 22-23 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of Davis.

Appellants have stipulated on page 5 of their brief that the rejected claims stand or fall together for purposes of this appeal.

Based upon the record before us, we find that the examiner has failed to make out a prima facie case of obviousness with respect to any of the rejections before us. Accordingly, we shall reverse each of the rejections on appeal.

With regard to basic claim 1, we agree with the examiner that Kosaki shows all the features claimed other than “a passageway disposed around the periphery of the wafer” to provide for laminar flow of electroplating solution “over the upper surface of the wafer, toward the center of the wafer, and then upward” within the cell.

We also agree that Brinket suggests the possibility of laminar flow of solution across the surface of a semiconductor substrate in a similar electroplating apparatus for uniform plating of metals on the substrate.

However, in our opinion, the fatal defect in all of the examiner's rejections is the reliance upon Suitor as the key

reference to cure the deficiencies of Kosaki and Brinket. As we see it, Suitor does not provide the requisite motivation to provide a passageway, as defined in the present claims, in the electroplating apparatus of Kosaki or Brinket.

Suitor relates to electrodialysis apparatus used to separate oxygen from gases, and bears no clear relationship to electroplating apparatus, as in Kosaki or Brinket, which are typically used to form a metallic layer on the surface of a substrate; the layer being deposited by an electroplating solution. In essence, the examiner has failed to convincingly explain why the benefit discussed by Suitor, i.e., uniform removal of <u>oxygen through</u> an oxygen conductive solid electrolyte disk by radial flow of feedstock gas from the outside edge of the disk to the center (col. 1, ll. 35-40), would be considered pertinent to electroplating apparatus by those of ordinary skill in the plating art.

While the examiner and the appellants focus upon differences and similarities in the fluid flow characteristics of gases and liquids, we focus upon the distinction between electrodialysis (passage of oxygen <u>through</u> a solid electrolyte as in Suitor) and electroplating (deposition of a metallic layer <u>on the surface</u> of a substrate as in Kosaki). Accordingly, in our view, the

problems addressed by Suitor do not appear to be reasonably pertinent to the objective of attaining a uniform metallic plating layer on the surface of a substrate, and the examiner has failed to convince us otherwise.

None of the other references relied upon by the examiner cure the deficiency in the examiner's case which we have discussed above. Accordingly, the decision of the examiner is reversed.

REVERSED

MARC L. CAROFF Administrative Patent Judge	)	
CHUNG K. PAK Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
CHARLES F. WARREN Administrative Patent Judge	)	

MLC/hh

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