UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YEZDI N. DORDI,
JOSEPH J. STEVENS,
H. PETER W. HEY
and DONALD J.K. OLGADO

Appeal 2008-0087
Application 10/609,862
Technology Center 1700

Decided: November 29, 2007

Before EDWARD C. KIMLIN, BRADLEY R. GARRIS, and
PETER F. KRATZ, *Administrative Patent Judges*.

KIMLIN*, Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-5, 7, and 9-30.[1] Claims 1 and 26 are illustrative:

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[1] Appellants have withdrawn the appeal of claim 8 (see Reply Br. 3, second para.).

1. An electrochemical plating cell, comprising:

a cell body configured to contain a plating solution and having an open upper portion configured to receive a substrate for plating;

an anode positioned in the cell body; and

a diffusion member positioned across the cell body between the anode and the open upper portion, wherein the diffusion member has a substantially uniform thickness and is made from a porous material.

26. An electrochemical plating cell, comprising:

a cell body configured to contain a plating solution therein;

an anode positioned in the cell body;

a rigid diffusion member positioned across the cell body above the anode, wherein the diffusion member has a substantially uniform thickness and is made from a porous material; and

a membrane positioned across the cell body above the anode and below the diffusion member.

The Examiner relies upon the following references as evidence of obviousness:

Perkins, Jr.	3,047,574	Oct. 29, 1968
Calhoun	5,883,762	Mar. 16, 1999
Landau	6,261,433 B1	Jul. 17, 2001

Appellants' claimed invention is directed to an electrochemical plating cell comprising a diffusing member positioned between the anode and the open upper portion of the cell. Appealed claim 1 defines the diffusing member as having a substantially uniform thickness whereas claim 26 defines a rigid diffusion member having a substantially uniform thickness.

According to Appellants' Specification, the rigid diffusion member is an improvement over the diffusion members of the prior art "typically formed as a sheet or layer of permeable plastic" (Spec. 3: para. 0004), which "bow or deform to assume an upwardly facing convex shape when electrolyte solution flows upwardly through the diffuser from below" (Spec. 4: first sentence).

Appealed claims 1-5, 9-13, and 16-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Landau in view of Perkins. Claims 7, 14, 15, and 26-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the stated combination of references further in view of Calhoun.

We have thoroughly reviewed the respective positions advanced by Appellants and the Examiner. In so doing, we find that the prior art evidence relied upon by the Examiner fails to establish a prima facie case of obviousness for the claimed subject matter. Accordingly, we will not sustain the Examiner's rejections.

Landau, as acknowledged by the Examiner, fails to disclose an electrochemical plating cell having a diffusion member that has a substantially uniform thickness. Instead, the electrochemical plating cell of Landau comprises a flow adjuster 110, or diffusion member, that has a variable thickness conical profile which provides enhanced flow uniformity across the substrate plating surface (*see* col. 13, ll. 33 et seq.). Significantly, Landau has no teaching that the diffusion member having a variable thickness is an improvement over any known diffusion member having a substantially uniform thickness.

To remedy this deficiency in the Landau disclosure the Examiner relies upon Perkins who discloses a chromatographic column comprising a porous diffusion member of uniform thickness having a porosity gradient across its width. According to the Examiner, it would have been obvious for one of ordinary skill in the art to substitute the diffusion member of Perkins for the diffusion member of Landau having a variable thickness "because the two were considered to be functional equivalents of each other" (Ans. 5, third para.). The Examiner relies upon Perkins' teaching that there are several options for readjusting the flow profile of fluid within a cylinder of circular cross section, two of which are "(1) a porous material having a non-uniform thickness profile (thicker at the periphery) and (2) a porous material having a porosity gradient (less porous at the periphery)" (Ans. 8, second para.).

The flaw in the Examiner's reasoning is that any equivalence taught by Perkins regarding diffusion members of uniform thickness and variable thickness is directed to their use in a chromatographic column, not in the electrochemical plating cell of the type disclosed by Landau and presently claimed. Manifestly, different flow characteristics are associated with gaseous flow in a packed, chromatographic column and liquid flow in an electrochemical plating cell. The Examiner has cited no evidence that diffusion members are interchangeable in chromatographic columns and electrochemical plating cells. It is not enough for the Examiner to rely upon the fact that both gases and liquids are fluids.

The Examiner's additional citation of Calhoun for placing a membrane around the anode to prevent oxidation of species in the electrolyte does not

remedy the deficiency of the combination of Landau and Perkins set forth above.

One final point remains. As discussed above, Appellants' Specification describes the present invention as a rigid diffusion member having a uniform thickness which is an improvement over the flexible plastic diffusion members of the prior art that bow or deform into a convex shape during use, thereby causing non-uniform plating. However, only some of the claims on appeal define the diffusion member as rigid, namely, claims 2-5, 11, and 26-30. Independent claims 1 and 13, on the other hand, fail to define the diffusion member as rigid. Claim 1 only requires that "the diffusion member has a substantially uniform thickness and is made from a porous material." Hence, the question arises whether the permeable plastic diffusion members of the admitted prior art also have a substantially uniform thickness and, therefore, meet the requirements of the diffusion member recited in many of the claims on appeal. Accordingly, under the provisions of 37 C.F. R. § 41.50(a)(1), this application is remanded to the Examiner to determine, as a matter of fact, whether the flexible plastic diffusion members of the admitted prior art have the claimed substantially uniformed thickness. Also, we hereby Order Appellants to place of record, to the best of their knowledge, the thickness profile of the flexible plastic diffusion members of the admitted prior art. *See* 37 C.F.R. § 41.52(d). Appellants are given thirty (30) days to respond to this Order.

In conclusion, based on the foregoing, the Examiner's decision rejecting the appealed claims is reversed. Also, the application is remanded to the Examiner for the reasons set forth above and, inasmuch as, the remand is not made for further consideration of a rejection, 37 C.F.R. § 41.50(a)(2) does not apply.

REVERSED/REMANDED

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