

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

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ANDREJ S. MITROVIC, ERIC J. STRANG, MURRAY D.  
SIRKIS, BILL H. QUON, RICHARD PARSONS, and YUJI  
TSUKAMOTO

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Appeal 2007-0030  
Application 10/359,557  
Technology Center 2100

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Decided: May 3, 2007

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Before JAMES D. THOMAS, JOSEPH F. RUGGIERO, and  
JEAN R. HOMERE, *Administrative Patent Judges*.

RUGGIERO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Final Rejection of claims 1-11, 27, and 28. We have jurisdiction under 35 U.S.C. § 6(b).

Appellants' disclosed invention relates to a device and system for generating and controlling a plasma formed in a capacitively coupled plasma system having a plasma electrode and a bias electrode formed by a workpiece support member. The plasma electrode has a unitary structure with multiple regions defined by a plurality of RF power feed lines and the RF power delivered to the feed lines.

We affirm.

Claim 1 is illustrative of the invention and it reads as follows:

1. An electrode apparatus for use in plasma processing, comprising:
  - a) a unitary electrode arranged within a plasma chamber;
  - b) a radio frequency (RF) power supply; and
  - c) a RF multiplexer electrically connected to said RF power supply and to a plurality of locations on said unitary electrode via a corresponding plurality of RF feed lines to establish a plurality of electrode regions corresponding to said plurality of RF feed lines, wherein power is capacitively coupled to the plasma within the plasma chamber.

The Examiner relies on the following prior art references to show unpatentability:

Ishii	US 6,024,827	Feb. 15, 2000
Denholm	US 6,101,971	Aug. 15, 2000 (filed Dec. 22, 1998)
Murata	US 6,363,881 B2	Apr. 2, 2002 (filed Jan. 19, 1999)

Claims 1, 2, 4, 6, 7, 27, and 28 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Murata. Claims 3, 5, and 8-11 stand rejected under 35 U.S.C. § 103(a). As evidence of obviousness, the

Examiner offers Murata in view of Denholm with respect to claims 3, 5, and 11, and Murata in view of Ishii with respect to claims 8-10.<sup>1</sup>

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Final Office action, Briefs, and Answer for the respective details.

## ISSUES

- (i) Under 35 U.S.C § 102(e), does Murata have a disclosure which anticipates the invention set forth in claims 1, 2, 4, 6, 7, 27, and 28? Specifically, does Murata disclose a plasma processing apparatus including an RF multiplexer, an RF power supply, and the capacitive coupling of power to the plasma within a plasma chamber?
- (ii) Under 35 U.S.C § 103(a), with respect to appealed claims 3, 5, and 8-11, has the Examiner established a prima facie case of obviousness based on Murata taken in separate combinations with the secondary references to Denholm and Ishii?

## PRINCIPLES OF LAW

### 1. ANTICIPATION

It is axiomatic that anticipation of a claim under § 102 can be found if the prior art reference discloses every element of the claim. *See In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986) and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984).

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<sup>1</sup> As indicated at page 3 of the Answer, the Examiner has withdrawn the 35 U.S.C. § 112, first paragraph, rejection of claims 1-11, 27, and 28.

In rejecting claims under 35 U.S.C. § 102, a single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation. *Perricone v. Medicis Pharmaceutical Corp.*, 432 F.3d 1368, 1375-76, 77 USPQ2d 1321, 1325-26 (Fed. Cir. 2005), citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565, 24 USPQ2d 1321, 1326 (Fed. Cir. 1992). Anticipation of a patent claim requires a finding that the claim at issue “reads on” a prior art reference. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346, 51 USPQ2d 1943, 1945 (Fed Cir. 1999) (“In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.”) (internal citations omitted).

## 2. OBVIOUSNESS

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). See also *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Examiner can satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellant. *Oetiker*, 977 F.2d at 1445, 24 USPQ2d at 1444. See also *Piasecki*, 745 F.2d at 1472, 223 USPQ at 788. Thus, the Examiner

must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the Examiner's conclusion.

## ANALYSIS

### 35 U.S.C. § 102(e) REJECTION

With respect to the 35 U.S.C. § 102(e) rejection of independent claims 1 and 4 based on the teachings of Murata, the Examiner indicates (Final Office action 4-5) how the various limitations are read on the disclosure of Murata. In particular, the Examiner directs attention to the portions of the disclosure at columns 7-9 of Murata as well as the illustration in Murata's Figure 8.

In our view, the Examiner's analysis is sufficiently reasonable that we find that the Examiner has at least satisfied the burden of presenting a prima facie case of anticipation. The burden is, therefore, upon Appellants to come forward with evidence and/or arguments which persuasively rebut the Examiner's prima facie case. Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Briefs have not been considered and are deemed to be waived [see 37 C.F.R. § 41.37(c)(1)(vii)].

Appellants' response asserts that the Examiner has not shown how each of the claimed features is present in the disclosure of Murata so as to establish a prima facie case of anticipation. Appellants' arguments focus on the contention that, in contrast to the claimed invention, Murata has no

disclosure of the capacitive coupling of power to the plasma within the plasma chamber. According to Appellants (Br. 7-8; Reply Br. 1-3), the plasma apparatus described by Murata, instead of capacitive coupling, utilizes inductive coupling of RF power to the plasma chamber with the rungs of the ladder-shaped electrodes 32 being inductors.

After careful review of the Murata reference in light of the arguments of record, however, we are in general agreement with the Examiner's position as stated in the Answer. Initially, we note that both the Examiner (Answer 3) and Appellants (Br. 5) agree that the ordinarily skilled artisan would recognize that a plasma reactor having two electrodes in parallel would involve the capacitive coupling of power to the plasma within the reactor. Such a prior art plasma reactor structure is discussed at column 2, lines 8-49 of Murata and illustrated in Murata's Figure 12. As described, such a parallel plate arrangement includes a high frequency electrode 22 and a parallel electrode in the form of a heater 23.

Our review of the disclosed invention of Murata, which includes the use of a power distributor to uniformly distribute power to the plasma electrodes, reveals that Murata in fact discloses exactly such a parallel electrode arrangement as illustrated, for example, in Figure 8. While Appellants are correct that the Murata reference discloses the power distribution feature in the context of a plasma reactor system which uses a ladder-shaped electrode 32, we do not find any support for Appellants' conclusion that this necessarily means that power is inductively coupled, rather than capacitively coupled, to the plasma within the reactor.

Appellants direct attention to column 1, line 20 of Murata which, in their view (Br. 5; Reply Br. 2), establishes that a ladder electrode means a

ladder inductance electrode. We find, however that the cited passage from Murata merely indicates that an example of a plasma system which uses a ladder electrode includes a ladder antenna electrode and a ladder inductance electrode. We find it particularly noteworthy that the description of the power distribution feature in the “DETAILED DESCRIPTION OF THE INVENTION” section of the Murata reference never mentions inductive coupling, never identifies the ladder-shaped electrode 32 as an antenna or inductance electrode, and never illustrates (e.g., Figure 8) the plasma device structure as anything other than a parallel electrode arrangement.

With the above discussion in mind, we find no error in the Examiner’s conclusion (Answer 3-5) that Murata discloses a plasma processing system which includes the sectioned unitary electrode (adjacent a chamber upper wall with a workpiece support adjacent a chamber lower wall), RF multiplexer, and capacitive coupling as claimed. Our review of the language of appealed independent claims 1 and 4 supports the Examiner’s position since we simply find no language which defines any capacitive coupling structure which would distinguish over that disclosed by Murata. In our view, it is particularly relevant that the only portion of Appellants’ disclosure (Specification 4) which describes any capacitive coupling arrangement discloses that such capacitive coupling structure includes two electrodes, i.e., a plasma electrode and a bias electrode. The structure set forth in independent claims 1 and 4, however, recites only a single electrode.

Further, we do not necessarily disagree with Appellants’ contention (Reply Br. 2-3) that the mere presence of capacitors in the Figures 4 and 5 illustrations in Murata indicates that capacitive coupling is present, just as the presence of coils in these same figures does not indicate that inductive

coupling is present. We find no evidence forthcoming from Appellants, however, that supports the conclusion based on the discussion of electrode aspect ratio (*id.* 2) that the rungs of the ladder in the ladder shaped electrode in Murata are inductors or that inductive coupling, not capacitive coupling, is taking place. The arguments of counsel cannot take the place of evidence in the record. *See In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997).

In view of the above discussion, since all of the claimed limitations are present in the disclosure of Murata, the Examiner's 35 U.S.C. § 102(e) rejection of independent claims 1 and 4, as well as dependent claims 2, 6, 7, 27, and 28 not separately argued by Appellants, is sustained.

### 35 U.S.C. § 103(a) REJECTIONS

Appellants' arguments (Br. 10; Reply Br. 3-4) in response to the Examiner's obviousness rejection of dependent claims 3, 5, and 11 based on the combination of Murata and Denholm contend that the Examiner has not established proper motivation for the proposed combination of references. For all of the reasons articulated by the Examiner (Answer 5-6), however, we find that the ordinarily skilled artisan would have recognized and appreciated that the plasma system computer control with database access teachings of Denholm would have been an obvious enhancement to the system of Murata.

To whatever extent Appellants are suggesting that the Examiner's proposed addition of Denholm to Murata must fail since, in Appellants' view, Denholm does not provide a disclosure of controlling a RF multiplexer, we find such contention to be without merit since the Examiner

has relied upon Murata for a teaching of power distribution using RF multiplexing. It is apparent from the Examiner's line of reasoning in the Answer that the basis for the obviousness rejection is the combination of Murata and Denholm. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller*, 642 F. 2d 413, 425, 208 USPQ 871, 881(CCPA 1981); *In re Merck & Co., Inc.*, 800 F. 2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986).

Accordingly, since the Examiner's prima facie case of obviousness has not been overcome by any convincing arguments from Appellants, we sustain the Examiner's 35 U.S.C. § 103(a) rejection of claims 3, 5, and 11 based on the combination of Murata and Denholm.

Turning to a consideration of the Examiner's obviousness rejection of dependent claims 8-10 based on the combination of Murata and Ishii, we sustain this rejection as well. Appellants' arguments (Br. 10-11; Reply Br. 4) contend that Ishii does not make up for the deficiencies of Murata since Ishii, like Murata, discloses a plasma reactor system with inductive, not capacitive, power coupling. We find these arguments to be without merit since, for all of the reasons discussed *supra*, we find that Murata discloses a plasma reactor system with capacitive coupling, at least in the manner broadly set forth by Appellants' claims on appeal.

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## CONCLUSION

In summary, we have sustained the Examiner's rejections of all the claims on appeal. Therefore, the decision of the Examiner rejecting claims 1-11, 27, and 28 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv)(effective September 13, 2004).

AFFIRMED

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