

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 15

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte KENNETH S. COLLINS,  
CRAIG A. RODERICK,  
JOHN R. TROW,  
CHAN-LON YANG,  
JERRY YUEN-KUI WONG,  
JEFFREY MARKS,  
PETER R. KESWICK,  
DAVID W. GROECHEL,  
JAY D. PINSON, II,  
TETSUYA ISHIKAWA,  
LAWRENCE CHANG-LAI LEI,  
and  
MASATO M. TOSHIMA

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Appeal No. 1999-0865  
Application No. 08/468,573

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ON BRIEF

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Before JERRY SMITH, FLEMING, and RUGGIERO, Administrative Patent Judges.

RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal from the final rejection of claims 57-68, which are all of the claims pending in the present application. Claims 1-56 have been canceled. An amendment filed

Appeal No. 1999-0865  
Application No. 08/468,573

June 8, 1998 after final rejection was approved for entry by the Examiner.

The disclosed invention relates to an inductively coupled plasma processing system in which an RF inductive antenna is utilized to apply RF power into the plasma reactor chamber. Loading circuitry, which matches the impedance of the source antenna to the output impedance of the RF power generator, is provided by a variable capacitance connected between ground and the connection point between the RF power supply and one end of the antenna. Tuning circuitry in the form of another variable capacitance is connected between ground and the other end of the antenna.

Claim 57 is illustrative of the invention and reads as follows:

57. A local impedance transforming network for connection to a transmission antenna having a first terminal and a second terminal to allow power coupling between a power supply line connected to said first terminal and said antenna, comprising:

a first capacitor connected between said first terminal of said antenna and an electrical node at a predetermined potential, said first terminal being configured to be connected to said power supply line; and

a second capacitor connected between said second terminal of said antenna and said electrical node.

Appeal No. 1999-0865  
Application No. 08/468,573

The Examiner relies on the following prior art:

Fessenden	1,101,914	Jun. 30, 1914
Keeble	4,844,775	Jul. 04, 1989
Müller	4,849,675	Jul. 18, 1989
Barnes et al. (Barnes)	5,241,245	Aug. 31, 1993
		(filed May 06, 1992)

Claims 57-60 stand finally rejected under 35 U.S.C. § 102(b) as being anticipated by Fessenden. Claims 61-68 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Keeble in view of Fessenden, Barnes, and Müller.

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Briefs<sup>1</sup> and Answer for the respective details.

#### OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the Examiner, the arguments in support of the rejection, and the evidence of anticipation and obviousness relied upon by the Examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellants' arguments

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<sup>1</sup> The Appeal Brief was filed June 9, 1998. In response to the Examiner's Answer dated June 24, 1998, a Reply Brief was filed July 13, 1998, which was acknowledged and entered by the Examiner as indicated in the communication dated July 24, 1998.

Appeal No. 1999-0865  
Application No. 08/468,573

set forth in the Briefs along with the Examiner's rationale in support of the rejections and arguments in rebuttal set forth in the Examiner's Answer.

It is our view, after consideration of the record before us, that the Fessenden reference fully meets the limitations of claims 57, 58, and 60. We reach the opposite conclusion with respect to claim 59. We are also of the view that the Examiner has not established a prima facie case of obviousness with respect to the 35 U.S.C. § 103(a) rejection of claims 61-68 based on the combination of Keeble in view of Fessenden, Barnes, and Müller. Accordingly, we affirm-in-part.

We also use our authority under 37 CFR § 1.196(b) to enter a new ground of rejection of claims 59 and 61-68. The basis for these conclusions will be set forth in detail below.

Appellants' arguments in response to the Examiner's rejections of the appealed claims are organized according to a suggested grouping of claims indicated at page 3 of the Brief. We will address these arguments accordingly, and will consider the appealed claims separately only to the extent that separate arguments are of record in this appeal. Any dependent claim not argued separately in the Briefs will stand or fall with its base

Appeal No. 1999-0865  
Application No. 08/468,573

claim. Note In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983).

With respect to independent claim 57, the representative claim for Appellants' first suggested grouping, the Examiner indicates (Answer, page 5) how the various limitations are read on the disclosure of Fessenden. In particular, the Examiner points to the illustrations in Fessenden's Figures 1-6 and 9 and the accompanying description at pages 1-3 of Fessenden. 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 (see 37 CFR § 1.192(a)).

Appellants' arguments in response (Brief, pages 4 and 5; Reply Brief, page 2) focus on the Examiner's alleged misinterpretation of the Fessenden reference which, in Appellants' view, has no disclosure of the connection of a first

Appeal No. 1999-0865  
Application No. 08/468,573

terminal to a power supply line as required by claim 57. In making this assertion, Appellants offer an interpretation which concludes that in addition to first and second terminals which are capacitively coupled to ground, Fessenden requires additional terminals, i.e., third and fourth terminals in Appellants' terminology, for coupling to a power supply line. According to Appellants, it is these "third" or "fourth" terminals to which Fessenden's power supply line is connected, and not to the first terminal as claimed.

After careful review of the Fessenden reference in light of the arguments of record, however, we are in agreement with the Examiner's position as stated in the Answer. Our interpretation of the disclosure of Fessenden coincides with that of the Examiner, i.e., a connection does in fact exist between the power supply and a first terminal (which Appellants call a "third" terminal) of the antenna. As pointed out by the Examiner (Answer, page 5), this connection is present even if it is effected by inductive coupling. It is further our view that even assuming, arguendo, that Appellants are correct in their contention that any connection between Fessenden's first antenna

Appeal No. 1999-0865  
Application No. 08/468,573

terminal and the "third" terminal is through the antenna itself, such a connection is not precluded by the language of independent claim 57.

As to Appellants' further argument (Brief, page 5) that Fessenden lacks any teaching of a grounded capacitor at the signal source, we find that such argument is not commensurate with the scope of the claim. It is axiomatic that, in proceedings before the PTO, claims in an application are to be given their broadest reasonable interpretation consistent with the specification, and that claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art. In re Sneed, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983). Moreover, limitations are not to be read into the claims from the specification. In re Van Geuns, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993) citing In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). Our review of the language of appealed claim 57 reveals no limitations directed to any signal source location of a grounded capacitor.

In view of the above discussion, since all of the claimed limitations are present in the disclosure of Fessenden,

Appeal No. 1999-0865  
Application No. 08/468,573

the Examiner's 35 U.S.C. § 102(b) rejection of independent claim 57, as well as dependent claims 58 and 60 which stand or fall with claim 57, is sustained.

Turning to a consideration of the Examiner's 35 U.S.C. § 102(b) rejection of dependent claim 59, grouped and argued separately by Appellants, we note that, while we found Appellants' arguments to be unpersuasive with respect to the Examiner's rejection of claims 57, 58, and 60 discussed supra, we reach the opposite conclusion with respect to claim 59. The language of claim 59, unlike that of claims 57, 58, and 60, limits the application of the claimed antenna to ". . . coupling power into a plasma processing chamber."

In addressing the language of claim 59, the Examiner chooses to ignore the "plasma chamber" language, asserting that such language is a mere statement of intended use. We find the Examiner's position to be unfounded. Although the Examiner has cited (Answer, page 9) the Pearson and Minks decisions in support of his position, these decisions, as pointed out by Appellants, address the situation where "intended use" limitations appear solely in the claim preamble. In contrast, the recitation of power coupling to a plasma processing chamber in appealed claim 59 appears in the body of the claim. Our reviewing courts have

Appeal No. 1999-0865  
Application No. 08/468,573

held that, in assessing patentability of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 983-84, 180 USPQ 580, 582 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Accordingly, since all of the limitations of claim 59 have not been shown to be expressly disclosed or inherent in the Fessenden reference, the Examiner's 35 U.S.C. § 102(b) rejection of dependent claim 59 is not sustained.

We next consider the Examiner's obviousness rejection of claims 61-68 and note that in rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion, or implication in the prior art as a whole

Appeal No. 1999-0865  
Application No. 08/468,573

or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

With respect to appealed claims 61-68, the Examiner, as the basis for the obviousness rejection, proposes to modify the plasma processing system of Keeble. According to the Examiner (Answer, page 6), Keeble discloses the claimed invention except for the inclusion of two variable capacitance elements connected to the ends of an antenna. To address this deficiency, the Examiner initially turns to Barnes and Müller, each of which discloses plasma systems with a variable capacitance at the end of an antenna for tuning. Fessenden is added to the combination to provide a teaching of variable tuning capacitances at both ends of an antenna. In the Examiner's line of reasoning, the

Appeal No. 1999-0865  
Application No. 08/468,573

skilled artisan would have found it obvious to provide an additional variable capacitor at a second end of a plasma system antenna in the system of Keeble as modified by Barnes and Müller " . . . so that the entire antenna is tunable for optimum performance as taught by Fessenden." (Id. at 7).

In response, Appellants assert several arguments (Brief, pages 6-8; Reply Brief, page 2) in support of the position that the Examiner has not established proper motivation for the proposed combination of references so as to set forth a prima facie case of obviousness. After careful review of the applied prior art in light of the arguments of record, we are in agreement with Appellants' position as stated in the Briefs. We fail to see how the spark gap non-resonant length antenna of Fessenden used for telegraphy has relevance to the coiled resonant length antennas of the plasma systems of Keeble, Barnes, and Müller. None of the problems sought to be overcome by Fessenden would be expected to exist in the plasma systems of Keeble, Müller, and Barnes. In view of the above, we are left to speculate why the skilled artisan would employ any of the features of Fessenden in the plasma systems of the applied prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification

Appeal No. 1999-0865  
Application No. 08/468,573

obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992).

Accordingly, since the Examiner has not established a prima facie case of obviousness, the 35 U.S.C. § 103 rejection of claims 61-68 over the combination of Keeble, Barnes, Müller, and Fessenden is not sustained.

Rejection under 37 CFR § 1.196(b)

We make the following new ground of rejection using our authority under 37 CFR § 1.196(b). Claims 59 and 61-68 are rejected under 35 U.S.C. § 103 as being unpatentable over Müller, of record. As asserted by Appellants (Brief, page 6), we interpret the limitations of appealed claims 59 and 61-68 as requiring ". . . coupling RF energy to a coil antenna associated with a plasma reactor in which both ends of the coil antenna are capacitively grounded or otherwise connected to a predetermined potential." We further find no recitation in claims 59 and 61-68 that would limit the claimed capacitances to a particular structure or function. In our view, the plasma reactor system disclosed by Müller meets all of the claimed requirements. As illustrated in Figure 2 and described at column 4, lines 45-57 of Müller, RF energy 12 is applied to the multi-turn cylindrically

Appeal No. 1999-0865  
Application No. 08/468,573

shaped antenna coil 2 of a plasma reactor 1, with the antenna ends 5 and 6 capacitively coupled to ground through variable capacitance 15 connected to the symmetrical point of the coil. It is our opinion that the skilled artisan would recognize the obviousness of, instead of utilizing a single capacitance element as explicitly described in Müller, utilizing multiple capacitance elements of smaller capacity connected in parallel to achieve the identical desired capacitance value.

We further note that, with respect to claim 59, Müller also provides for the coupling of the RF energy generator to a first terminal of the antenna coil antenna through connection point 13 as required by the recitation in claim 57, the base claim for claim 59.

In summary, we have reversed the Examiner's 35 U.S.C. § 102(b) rejection of claim 59, as well as the Examiner's 35 U.S.C. § 103(a) rejection of claims 61-68, but have sustained the Examiner's 35 U.S.C. § 102(b) rejection of claims 57, 58, and 60. We have entered a new ground of rejection against claims 59 and 61-68 under 37 CFR § 1.196(b).

Appeal No. 1999-0865  
Application No. 08/468,573

In addition to affirming the examiner's rejection of one or more claims, this decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b). 37 CFR § 1.196(b) provides that "[a] new ground of rejection shall not be considered final for purposes of judicial review."

Regarding any affirmed rejection, 37 CFR § 1.197(b) provides:

(b) Appellants may file a single request for rehearing within two months from the date of the original decision . . . .

37 CFR § 1.196(b) also provides that the appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (37 CFR § 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner . . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record . . . .

Should the appellants elect to prosecute further before the Primary Examiner pursuant to 37 CFR § 1.196(b)(1), in order to

Appeal No. 1999-0865  
Application No. 08/468,573

preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection, the effective date of the affirmance is deferred until conclusion of the prosecution before the examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If the appellants elect prosecution before the examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejection, including any timely request for rehearing thereof.

Appeal No. 1999-0865  
Application No. 08/468,573

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART  
37 CFR § 1.196(b)

JERRY SMITH	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
MICHAEL R. FLEMING	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
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Appeal No. 1999-0865  
Application No. 08/468,573

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