

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JESSE N. MATOSSIAN, JOHN D. WILLIAMS  
and WILFRIED KRONE-SCHMIDT

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Appeal No. 95-3366  
Application No. 08/113,550<sup>1</sup>

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ON BRIEF

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Before KIMLIN, OWENS and WALTZ, Administrative Patent Judges.  
KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 12-16, 20 and 28-36. Claims 25-27 have been allowed by the examiner. Claims 17-19, the other claims remaining in the present application, stand objected to as being dependent upon a rejected base claim. Claim 12 is illustrative:

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<sup>1</sup> Application for patent filed August 27, 1993.

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12. A method of heat treating at least one workpiece, comprising the steps of:

providing at least one workpiece;

selecting a heat treatment procedure for the at least one workpiece;

forming a plasma of an ionizing gas around the at least one workpiece, the plasma containing free electrons therein;

accelerating electrons from the plasma to the at least one workpiece with a series of pulses of positive voltage, relative to the plasma, applied to the workpiece to heat the workpiece; and

continuing the step of accelerating until the heat treatment procedure has been performed in the at least one workpiece.

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

Pendse	3,503,787	Mar. 31, 1970
Fridlyand	4,317,984	Mar. 2, 1982
Enomoto	4,500,564	Feb. 19, 1985
Giacobbe	4,872,926	Oct. 10, 1989
Dexter et al. (Dexter)	4,900,371	Feb. 13, 1990
Japanese '280 (Japanese Kokai patent application)	1-51280	Sep. 14, 1990
Japanese '250 (Japanese Kokai patent application)	2-161250	Feb. 20, 1992
European '550 <sup>2</sup>	0,062,550	Oct. 13, 1982

Appellants' claimed invention is directed to a method of heat treating a workpiece comprising forming a plasma of an

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<sup>2</sup> Our understanding of the Japanese '280, Japanese '250 and European '550 references is from the translations of record.

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ionizing gas, such as nitrogen, around the workpiece, generating free electrons from the plasma, and accelerating the electrons to the workpiece with a series of pulses of positive voltage. The electrons impact the workpiece and heat its surface in a uniform manner.

The appealed claims stand rejected under 35 U.S.C. § 103 as follows:

- (1) claims 12-14, 28 and 33 over Pendse;
- (2) claims 12-14, 28 and 33 over Fridlyand;
- (3) claims 12, 13, 15, 28, 30, 31 and 33 over Dexter;
- (4) claims 12, 13, 15, 28-31 and 33 over European '550;
- (5) claims 12, 13, 16, 28 and 33-36 over Japanese '354<sup>3</sup>;
- (6) claims 12, 13, 16, 28 and 33 over Japanese '265<sup>4</sup>;
- (7) claims 12, 14, 16, 20, 28 and 33-36 over Giacobbe; and
- (8) claim 32 over Pendse, Fridlyand, Dexter, Giacobbe, European '550, Japanese '265 or Japanese '354 in view of Enomoto.

We will not sustain the examiner's rejections over the singular disclosures of either Pendse, Fridlyand, Japanese '354, Japanese '265 or Giacobbe. All the appealed claims require

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<sup>3</sup> This corresponds to Japanese '280. The examiner has used an abbreviation of the publication number while this panel employs an abbreviation of the application.

<sup>4</sup> This corresponds to Japanese '250. See footnote 3 supra.

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accelerating electrons from the plasma to the workpiece with a series of pulses of positive voltage. However, none of these references teaches or suggests treating a workpiece by a process that includes voltage pulses. Accordingly, the stated references fail to evidence a prima facie case of obviousness for the claimed subject matter. The examiner states that "the examiner assumes that a plasma produced under a given set of conditions (voltage, power, etc.) would have a resultant certain effect with respect to an amount of free electrons produced" (page 6 of Answer). While it is hard to find fault with the examiner's assumption, the applied references do not teach or suggest the conditions of voltage pulses required by the appealed claims.

We will sustain the examiner's rejections under European '550 and Dexter. It is well settled that when a claimed process reasonably appears to be substantially the same as a process disclosed by the prior art, the burden is on the applicant to prove with objective evidence that the prior art process does not necessarily or inherently possess characteristics attributed to the claimed process. In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990); In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In the present case, although neither European '550 nor Dexter expressly states that the disclosed plasma-treating processes result in the impingement of

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electrons on the workpiece, we find that the process parameters disclosed in the references bear such a close correspondence to the parameters disclosed in appellants' specification that it is reasonable to conclude that the prior art processes generate electrons which impinge the surface of the workpiece being treated. We invite particular attention to a comparison of the paragraph bridging pages 12 and 13 of appellants' specification and claims 7 and 8 of European '550. Claim 7 of the reference recites high-voltage pulses at a frequency of 100 Hz, a value that falls directly within appellants' range of 10 Hz to about 3,000 Hz. Likewise, claim 7 of the reference and appellants' specification employ a pulse lasting 1 microsecond. Also, claim 8 of the reference applies a voltage of 1,500 volts, which falls directly within appellants' voltage of 1 kilovolt to about 100 kilovolts. Accordingly, based upon this close correspondence in operating conditions for generating a plasma of nitrogen for treating a workpiece, we find no merit in appellants' contention that "[t]here is no disclosure of heating the article by pulsed electron bombardment from a plasma" (page 13 of Brief). Appellants have not proffered the requisite objective evidence which establishes that the process of European '550 does not necessarily produce a pulsed electron bombardment. We also are not persuaded by appellants' argument that "[t]his reference does

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not relate to heat treating" (page 13 of Brief). The reference specifically states that the disclosed process is for thermochemical treatment of metals.

We also disagree with appellants' argument that European '550 "does not teach an ionizing gas that is reactive with the workpiece (claim 13)" (page 13 of Brief). Like appellants, the reference forms a plasma from nitrogen gas under the same process parameters. We note the disclosure at page 12 of appellants' specification that "[t]he use of nitrogen as the ionizing gas can result in not only heating but also formation of a hard nitride layer at the surface of the workpiece." As for the discontinuous pulses of claim 15, this much is suggested at page 4 of the reference, first paragraph. Regarding the claim 33 requirement of providing at least two workpieces, we find that it would have been prima facie obvious for one of ordinary skill in the art to treat any number of workpieces that can be practically accommodated in a reactor.

For the rejection over Dexter our analysis is essentially the same. Dexter discloses the pulsed plasma thermochemical treatment of a workpiece and evidences that it was known in the art to use a high-voltage electrical discharge to generate a continuous plasma which envelopes the workpiece and heats it to the necessary temperature (see column 1). Although the reference

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does not specify the particulars of voltage, frequency and time for the process, European '550 evidences that the parameters employed by appellants were known to the skilled artisan. Appellants' argument that Dexter discloses ion plasma treatment rather than electron plasma treatment does not satisfy appellants' burden of placing of record objective evidence that the Dexter process does not necessarily result in an electron plasma treatment of the workpiece. In re Spada, 911 F.2d at 708, 15 USPQ2d at 1658; In re Best, 562 F.2d at 1255, 195 USPQ at 433.

We will also sustain the examiner's rejection of claim 32 under § 103 over either European '055 or Dexter in view of Enomoto. We agree with the examiner that based on the teachings of these references it would have been obvious for one of ordinary skill in the art to mask a portion of the workpiece being treated. Frankly, we do not understand appellants' statement that "Enomoto does not deal at all with plasma technology" (page 17 of Brief). We find it quite evident from the reference disclosure of an ion-bombardment surface treatment by the discharge of thermionicelectrons within an atmosphere of reacted gas that a plasma is generated. In any event, even without the Enomoto disclosure, we find it would have been obvious for one ordinary skill in the art to mask the portions of a workpiece for which heat treatment is not desired.

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Under the provisions of 37 CFR § 1.196(b), we enter the following new grounds of rejection:

(1) Claim 14 is rejected under 35 U.S.C. § 103 as being unpatentable over European '550. The reference discloses at column 4, first paragraph, the claim requirement for a continuous series of pulses.

(2) Claims 16 and 34 are rejected under 35 U.S.C. § 103 over European '550 in view of the admitted state of the prior art and Japanese '280. Appellants' specification, at page 2, and Japanese '280 at, for example, page 7 of the English translation, evidence that accelerated cooling of the treated workpiece was known in the art.

(3) Claim 20 is rejected under 35 U.S.C. § 103 as being unpatentable over European '550 in view of Giacobbe. As explained above, we find that it would have been obvious for one of ordinary skill in the art to employ the process of the European reference to treat at least two workpieces rather than just one. Also, Giacobbe discloses that only a very small number of system modifications are required in order to facilitate the heat treatment of a large number of specimens (column 2, lines 40 et seq.).

In conclusion, based on the foregoing, the examiner's rejection of claims 12, 13, 15, 28-31 and 33 over European '550

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and the rejection of claims 12, 13, 15, 28, 30, 31 and 33 over Dexter is sustained. A new ground of rejection under 37 CFR § 1.196(b) has been entered for claims 14, 16, 20 and 34.

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) (amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63,122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides, "[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) Appellant 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 appellant, 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 . . . .

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(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 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 reconsideration thereof.

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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)

EDWARD C. KIMLIN	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
TERRY J. OWENS	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
	)	
THOMAS A. WALTZ	)	
Administrative Patent Judge	)	

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