

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BARRET LIPPEY,
DARRELL A. GLEICHAUF
and
WELDON S. WILLIAMSON

Appeal No. 1998-0038
Application 08/236,780

ON BRIEF

Before GARRIS, PAK and WARREN, Administrative Patent Judges.

GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 1-18 which are all of the claims in the application.

The subject matter on appeal relates to a method of removing a cryofilm and/or an organic material from a

Appeal No. 1998-0038
Application No. 08/236,780

cryogenically cooled

Appeal No. 1998-0038
Application No. 08/236,780

substrate. This appealed subject matter is adequately illustrated by independent claims 1 and 5 which read as follows:

1. A method of removing a cryofilm from a cryogenically cooled substrate, comprising:

forming a plasma with charged ions, and

sputtering said cryofilm off of said substrate by directing ions from said plasma onto said cryofilm with an average energy of not more than about 30 eV.

5. A method of removing a cryofilm and organic material mixture from a substrate, comprising:

sputtering said cryofilm and a portion of said organic material off of said substrate with a sputtering plasma having an average ion energy of not more than about 30eV, and

removing the remainder of said organic material from said substrate by reacting it with a reactive plasma having an average ion energy of not more than about 30 eV.

The references set forth below are relied upon by the examiner as evidence of obviousness:

Barrington	3,567,927	Mar. 2, 1971
Benzing	4,786,352	Nov. 22, 1988
Champetier	4,846,425	Jul. 11, 1989

Akishin et al. (Akishin), "The Atomisation of Polymers by Argon, Helium, and Hydrogen Ions With Energies Up to 30 keV," Russian J. of Phys. Chem., 39(12), p. 1637 (Dec. 1965).

Cuomo et al. (Cuomo), "Substrate Cleaning by Low-Energy Bombardment," IBM Technical Disclosure Bulletin, 10(4), pp. 352-353 (Sep. 1967).

Appeal No. 1998-0038
Application No. 08/236,780

George, Patricia M., "Your Mirrors Are in Space and You Have to Clean Them," Research & Development, 30(10), pp. 109-114 (Oct. 1988).

Claims 1-4, 5-8, 14, 15 and 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Champetier.

Claims 5, 9, 10, 15 and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Barrington in view of Champetier, and dependent claims 11-13 and 17 stand correspondingly rejected over these references and further in view of Benzing, Cuomo and Akishin.

Finally, claims 1-4, 15 and 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over George.

We refer to the several briefs and answers for a complete discussion of the differing viewpoints expressed by the appellants and by the examiner concerning the above-noted rejections.

OPINION

For the reasons set forth below, we will sustain only the Section 103 rejection based upon Champetier alone.

As correctly pointed out by the examiner in the answer, Champetier discloses a method of removing contaminants from substrates on spacecraft such as cryogenic cooling systems

Appeal No. 1998-0038
Application No. 08/236,780

(e.g., see the Abstract and lines 43-47 in column 6). This method includes forming a plasma of charged ions and directing these ions onto the contaminated substrate using an energy range of, for example, 1 to 10 electron volts (e.g., see lines 32-58 in column 5). Further, patentee expressly teaches that his method removes contaminants by chemical as well as physical action (e.g., see lines 54-62 in column 5). We agree with the examiner's basic position that Champetier's aforementioned teachings would have suggested using patentee's method in order to remove contaminants from cryogenic cooling systems, particularly in light of the previously discussed express teaching in column 6, and that the resulting method would correspond to the method respectively defined by appealed independent claims 1, 5, and 16.

In support of their opposing view, the appellants set forth the following argument on page 4 of the brief:

Furthermore, and in order to focus on the specific teachings of the Champetier patent that are relevant to the patentability of the present invention, it is respectfully submitted that the Champetier patent states the following at column 5, lines 44-49.

"Similarly, although particles exhibiting a broad range of energies may be selected to practice the

Appeal No. 1998-0038
Application No. 08/236,780

invention, each individual application may call for a specific energy range in order to avoid initiating a sputtering reaction that would damage the substrate beneath the unwanted contaminant layer."
[Emphasis added]

Thus, it is respectfully submitted that the Champetier patent does not disclose or suggest sputtering a cryofilm off of a cryogenically cooled substrate as is taught and claimed in the present application, and specifically teaches away from sputtering. The Examiner's position is in direct opposition with the above quoted teachings of the Champetier patent.

We disagree with the appellants' interpretation of Champetier's disclosure at column 5, lines 44-49. In our opinion, this disclosure does not teach an artisan to avoid initiating a sputtering reaction of any kind, as the appellants seem to believe. Instead, this disclosure teaches the artisan to avoid initiating a level or degree of sputtering reaction that would damage the substrate beneath the unwanted contaminant layer. This last-mentioned interpretation is consistent with patentee's repeatedly expressed objective to remove contaminants while avoiding damage to the underlying substrate (e.g., see the paragraph bridging columns 2 and 3 as well as lines 57-61 in column 3). Moreover, this objective of Champetier fully corresponds to

Appeal No. 1998-0038
Application No. 08/236,780

the objective defined by the appellants in appealed dependent claim 4.

In addition to the foregoing, we point out that Champetier's method would necessarily and inherently effect the here-claimed sputtering step. This is because patentee uses an energy range which falls completely within the here-claimed range and because patentee expressly teaches applying his method to cryogenically cooled substrates (i.e., the aforementioned cryogenic cooling systems) as recited in the appealed claims. In these respects, we observe that the appellants expressly disclose on lines 20-27 of specification page 3 that the relatively low ionic energy under consideration effects sputtering in a cryogenic temperature regime. Thus, under the foregoing circumstances, it is reasonable to consider that Champetier's method, like the corresponding method defined by appealed independent claim 1, would necessarily and inherently effect the here-claimed sputtering step. See In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Also see In re King, 801 F.2d 1324, 1326-27, 231 USPQ 136, 138-39 (Fed. Cir. 1986) and the cases cited therein.

Appeal No. 1998-0038
Application No. 08/236,780

The appellants also seem to argue that Champetier contains no teaching or suggestion of a two-step process wherein contaminants are removed by reactive as well as non-reactive plasmas pursuant to appealed independent claims 5 and 15. This argument is unpersuasive. As noted earlier and correctly pointed out by the examiner, Champetier expressly teaches removing contaminants by physical as well as chemical action (e.g., again see lines 54-63 in column 5).

Appeal No. 1998-0038
Application No. 08/236,780

For the above stated reasons, we will sustain the examiner's Section 103 rejection based on Champetier of independent claims 1, 5 and 15 as well as his corresponding rejection of non-argued, dependent claims 2-4, 6-8, 14 and 18.

However, we cannot sustain the examiner's Section 103 rejection of claims 5, 9, 10, 15 and 16 as being unpatentable over Barrington in view of Champetier or the corresponding rejection of claims 11-13 and 17 as being unpatentable over these references and further in view of Benzing, Cuomo and Akishin. We agree with the appellants that the applied prior art contains no teaching or suggestion for combining Barrington and Champetier in the manner proposed by the examiner. Specifically, we perceive no reason why an artisan would have replaced Barrington's heat/volatilization method for cleaning the electrode of his mass spectrometer with Champetier's ionic beam method for cleaning contaminants from spacecraft particularly since Barrington contains no disclosure that his electrode surface might be subject to damage of the type which Champetier expressly seeks to avoid via his low-energy, beam-cleaning method. Indeed, these

Appeal No. 1998-0038
Application No. 08/236,780

reference teachings would not have given the artisan a reasonable expectation that Champetier's low-energy method would successfully clean the electrode surface of Barrington's mass spectrometer. In re O'Farrell, 853 F.2d 894, 902-03, 7 USPQ2d 1673, 1680-1681 (Fed. Cir. 1988). This deficiency of the examiner's rejection based on Barrington in view of Champetier is, by itself, sufficient reason to not sustain the corresponding rejection based on these references and further in view of Benzing, Cuomo and Akishin, although we also perceive merit in the appellants' argument that the applied prior art contains no teaching or suggestion for combining these last three mentioned references with Barrington and Champetier in the manner proposed by the examiner.

As for the rejection based on George, the examiner makes a number of obviousness conclusions, one of which is expressed on page 12 of the answer as follows:

As to the energy range of the ion beam, George suggest that a variety of ion beam energy ranges are available in the range of 0.5 eV to several MeV, therefore the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a known range by

Appeal No. 1998-0038
Application No. 08/236,780

optimization for the best results, see *In re Aller*,
et al., [220 F.2d 454] 105 U.S.P.Q. 233 [CCPA 1955].
(See page[s] 109 and 112).

This conclusion of obviousness is deficient in a number of respects.

First of all, the 0.5 eV to several MeV energy range disclosed by George relates to the energy levels capable of being produced by available ion guns or ion beam generators and not to energy levels adequate for effectively cleaning cryogenic substrates as the examiner would have us believe. Instead, the energy levels specifically taught by George as being adequate for this latter purpose range from over 1 to 5 keV (e.g., see the sputter rate graph on the second page of text and the second full paragraph on the last page of text). It is significant that these specifically disclosed energy levels of George are orders of magnitude higher than the maximum value claimed by the appellants. While the optimization of a result effective parameter generally would have been obvious as indicated by the examiner in his above-quoted obviousness conclusion, an exception to this general rule occurs when, as here, the claimed parameter values lie significantly outside the value range taught by the prior art

Appeal No. 1998-0038
Application No. 08/236,780

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

BRG:svt

Appeal No. 1998-0038
Application No. 08/236,780

HUGHES ELECTRONICS CORPORATION
Patent Docket Administration
Bldg. 001 M/S A109
P.O. Box 956
El Segundo, CA 90245