

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte DAVID W. WARREN and MICHAEL B. DONAHUE

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Appeal No. 2000-1042  
Application No. 08/986,449

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HEARD: March 20, 2002

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Before GARRIS, KRATZ, and POTEATE, Administrative Patent Judges.  
GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 1-15 which are all of the claims in the application.

The subject matter on appeal relates to a method for reducing carburization, oxidation, and the formation of coke on a metal object having an elongated surface exposed to hydrocarbon at high temperature. The method includes the steps of ion

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implanting an antifoulant into the metal object surface via an apparatus such as a cathodic arc plasma gun wherein the apparatus (or the plasma generated thereby) is relatively translated progressively lengthwise of the surface to uniformly ion implant the surface lengthwise thereof. This appealed subject matter is adequately illustrated by independent claim 1 which reads as follows:

1. The method for reducing carburization, oxidation, and the formation of coke on a metal object having an elongated surface exposed to hydrocarbon at high temperature in a process, that includes:

- a) providing ion implanting apparatus,
- b) operating said apparatus to ion implant selected antifoulant or antifoulants into the metal object surface, progressively along said surface,
- c) said metal object configured to have said ion implanted surface exposed to said hydrocarbon at high temperature in said process,
- d) said apparatus including a cathodic arc plasma gun which is relatively translated progressively lengthwise of said surface while producing a plasma acting to uniformly ion implant said surface lengthwise thereof.

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

Cabrera et al. (Cabrera)	4,714,632	Dec. 22, 1987
Conrad	4,764,394	Aug. 16, 1988
Gandman et al. (Gandman)	5,358,626	Oct. 25, 1994
Chan (Chan '920)	5,449,920	Sep. 12, 1995
Leung	5,558,718	Sep. 24, 1996
Heyse et al. (Heyse)	5,575,902	Nov. 19, 1996

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Chan et al. (Chan '429)	5,580,429	Dec. 3, 1996
Fetherston et al. (Fetherston)	5,693,376	Dec. 2, 1997

Claims 1-15 stand rejected under 35 U.S.C. § 103 as being obvious over Cabrera alone or considered with Fetherston, Conrad, Chan '920, Chan '429, and Leung.

In addition, the examiner has rejected claims 4-6 under 35 U.S.C. § 103 as being obvious over Cabrera in view of Heyse and Gandman or alternatively over Cabrera in view of Heyse and Gandman and further in view of Fetherston, Conrad, Chan '920, Chan '429, and Leung.

#### OPINION

None of the above noted rejections can be sustained.

As his primary prior art teaching, the examiner relies upon the disclosure in column 1 of Cabrera regarding prior art methods of reducing coke formation on metal surfaces exposed to hydrocarbon at high temperatures which methods include the ion implantation of silicon (see lines 11-49 in column 1). On pages 5 and 6 of the answer, the examiner presents the following exposition in support of his conclusion that it would have been obvious to modify this prior art ion implantation method in order to result in the appellants' claimed method:

It is acknowledged that the reference does not teach the process steps employed in ion implantation, i.e. the providing implanting apparatus, operating said

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apparatus to implant, as well as the dependent claim limitations of the implantation method, ion energy levels, doses, voltages, the specific antifoulants, reactor shapes and other expedients.

The invention as a whole however would have been obvious to one having ordinary skill in the art because the artisan equipped with the knowledge that ion implantation can be used to apply antifoulants, would have sufficient knowledge to provide the apparatus for such application; judiciously select proper antifoulant from known antifoulants including those listed; select the appropriate application conditions for given reactor and degree of protection sought. The sole suggestion needed is that of using the ion implantation as a means for providing protected reactor surfaces. Cabrera et al. does provide such suggestion.

In the alternative it would have been obvious to select the ion implantation method from various alternatives known in the art and determine the process expedients as shown in Leung, Chan, Chan et al., Conrad, Fetherston et al.

The deficiency of the section 103 rejection based on Cabrera alone is immediately revealed by the examiner's above quoted acknowledgment that "the reference does not teach the process steps employed in ion implantation, i.e. the providing implanting apparatus, operating said apparatus to implant, as well as the dependent claim limitations of the implantation method, ion energy levels, doses, voltages, the specific antifoulants, reactor shapes and other expedients." In light of this absence of any teaching concerning the appellants' claimed process steps,

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Cabrera alone clearly is evidentiarily insufficient to establish a prima facie case of obviousness vis-à-vis the here claimed method.

The other applied references do not cure the deficiency of Cabrera. At most, these references merely evince that certain features of the here claimed method were generally known in the prior art. However, this is not enough to establish a prima facie case of obviousness.

This is because obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Here, the examiner has failed to advance an exposition with meaningful specificity as to why the applied prior art would have provided an artisan with some teaching, suggestion or incentive to combine particular reference features in such a manner as to result in the appellants' claimed method.

For example, it is expressly argued in the brief that "[n]o reference teaches or suggests applicant's basic step of relatively moving the plasma and pipe (object) lengthwise of the pipe, to achieve uniformity, in implantation of a pipe bore"

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(brief, page 15). In searching the answer for a response to this argument, we find nothing even relevant to this claimed feature except a single remark by the examiner on page 9 of the answer, namely, that "[t]he moving plasma source, e.g. the 'plasma gun' is not believed to be invented by the appellant[s]." This utterly speculative remark provides absolutely no support for the examiner's conclusion of obviousness. On the record of this appeal, the examiner has not even proffered evidence that the claimed feature in question was known in the prior art much less that it would have been obvious to combine this feature with the prior art ion implantation method disclosed in column 1 of Cabrera in such a manner as to result in the here claimed method.

For the above stated reasons, we cannot sustain any of the section 103 rejections advanced by the examiner on this appeal.

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The decision of the examiner is reversed.

REVERSED

Bradley R. Garris	)	
Administrative Patent Judge	)	
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	)	
Peter F. Kratz	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
	)	
Linda Poteate	)	
Administrative Patent Judge	)	

BRG:tdl

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