

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. 11

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte DONALD KRAFT,  
EMMETT M. HOWARD JR.  
and R. SCOTT HIBBEN

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Appeal No. 1997-3304  
Application No. 08/181,936

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ON BRIEF

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Before COHEN, FRANKFORT, and LAZARUS, Administrative Patent Judges.

LAZARUS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 14, 17 and 18. Claims 15 and 16 have been canceled.<sup>1</sup>

We reverse and remand.

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<sup>1</sup> Claims 15 and 16 were canceled pursuant to the amendment filed November 14, 1994 (Paper No. 4).

BACKGROUND

The appellants' invention relates to a chemical vapor deposition trap used during manufacture of semiconductor wafers (specification, p. 1). A copy of the claims under appeal is set forth in the appendix to the appellants' brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Konno et al. (Japan'833)            1-312833            Dec. 18, 1989<sup>2</sup>  
(published unexamined Japanese patent application)

Philipossian                    4,950,156            Aug. 21, 1990

In a new ground of rejection, infra, we rely upon the following prior art:

Appellants' prior art disclosure (specification, pages 1 and 2)

Claims 1 through 14, 17 and 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Japan'833 in view of Philipossian.

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<sup>2</sup> Our understanding of this reference is based on a translation obtained by the U.S. Patent and Trademark Office. A copy of the translation is attached hereto for appellants' convenience.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejection, we make reference to the examiner's answer (Paper No. 10, mailed May 31, 1995) for the complete reasoning in support of the rejection, and to the appellants' brief (Paper No. 9, filed April 10, 1995) for the arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

The 35 U.S.C. § 103 rejection

We will not sustain the examiner's rejection of appellants' claims 1 through 14, 17 and 18 under 35 U.S.C. § 103.

Claim 1 is exemplary and recites,

A chemical vapor deposition trap, comprising:

a chamber for collecting chemical by-products, said chamber having an inlet coupled for receiving a vapor including said chemical by-products; and

a first pipe having an inlet coupled for receiving said vapor at a first pressure, said first pipe having an outlet coupled to said inlet of said chamber where said outlet of said first pipe is tapered to reduce said first pressure of said vapor before entry into said chamber.

Japan'833 (Fig. 1) teaches a chemical vapor deposition trap (9) and a pipe outlet coupled to the trap inlet, but does not teach or suggest that the pipe outlet is tapered or that there is any problem with gas flow into the trap.

Philipossian teaches a cone-like shaped inlet (40) to a furnace (Fig. 1) which is used in conjunction with an annular manifold around the furnace exit to produce an inert gas barrier that prevents ambient gas from entering the furnace. The cone-like shaped inlet (40) "suppresses the formation of re-circulation gas cells 41," making it easier to purge the furnace tube (10) (col. 5, lines 19-20). The problem described by Philipossian is that "the flow of gas passing the sharp corners of the inlet of FIG. 8 results in circular gas

cells 41 making it harder to purge the tube when changing from one gas flow to another" (col. 5, lines 22-25). The solution described by Philipossian is that "the optimum shape for suppressing re-circulation cells of entering reactant gases is obtained by increasing the curvature of...[the] sidewalls of the nozzle in the direction of theoretical flow streamlines" (col. 5, lines 41-45). Whereas Philipossian does discuss a gas flow problem at the entry of the furnace, the patentee does not discuss the processing of the spent furnace gas much less suggest that there is any problem with gas flow into a trap for collecting chemical by-products from the spent furnace gas.

It is the examiner's view that

[i]t would have been obvious to one of ordinary skill in the art to modify the inlet and outlet gas flow pipes of Japan '833 with the conical-like shape (40) of Philipossian... [t]he motivation being that the conical-like shape would enhance the gas flow's pressure along with being less susceptible to breakage (answer, page 4).

We do not see that the particular combination of the prior art references as relied upon by the examiner teaches or suggests a chemical vapor deposition trap like that claimed by

appellants. The teaching of Japan'833 simply does not deal with problems associated with a trap comprising a chamber for collecting chemical by-products, and it is therefore our view that the Philipossian reference would not have motivated one of ordinary skill in the art to modify the Japan'833 disclosure in the manner suggested by the examiner. Thus, it is our determination that the examiner's rejection is based on impermissible hindsight.<sup>3</sup> Accordingly, the examiner has not presented a prima facie case of obviousness and, for these reasons, we cannot sustain the examiner's rejection.

NEW GROUND OF REJECTION

Under the authority of 37 CFR § 1.196(b), this panel of the Board introduces the following new ground of rejection as to claims 1, 2, 8 and 9.

Claims 1, 2, 8 and 9 are rejected under 35 U.S.C. §

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<sup>3</sup> Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor. See Para-Ordnance Mfg. v. SGS Importers Int'l, 73 F.3d 1085, 1087, 37 USPQ 2d 1237, 1239 (Fed. Cir. 1995) (citing W. L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1551, 1553, 220 USPQ 303, 311, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)).

103 as being unpatentable over the appellants' prior art disclosure (specification, pages 1 and 2) in view of Philipossian.

Claims 1 and 8, the only two independent claims, both require a chamber for collecting chemical by-products and a tapered first pipe for introducing vapor into the chamber, wherein the taper of the pipe reduces the pressure of the vapor before entry thereof into the chamber.

At page 1 of appellants' specification it is disclosed that "[i]t is well known in the art that semiconductor wafer processing for integrated circuits includes processes that require chemical vapor depositions...." Thereafter, appellants specify a low pressure chemical vapor deposition reactor from which heated vapor exits to a trap to capture byproducts from the heated vapor. There is recognition of a problem of particle build up in the pipe at the inlet of the trap because of the sudden pressure change between the pipe and trap filter chamber and it is stated (specification, page 2) that "[t]o

alleviate the  
particle build-up, costly maintenance cleaning schedule  
procedures have been implemented by semiconductor wafer  
manufacturers resulting in undesirable down-time."

Thus, we find that all of the features of claims 1 and 8  
are found in the appellants' description of the prior art with  
the exception of the tapered pipe outlet coupled to the inlet  
of the chamber.

Both the application before us on appeal and Philipossian  
are in the same field of semiconductor wafer processing.  
Philipossian has recognized a problem associated with the flow  
of gas from inlet (15) into a furnace tube (10) for processing  
semiconductor wafers. More specifically, Philipossian (Fig.  
8) shows that the problem involves turbulent, recirculating  
gas flow at the sharp corners of the inlet of the furnace. As  
explained in column 5, lines 22-35, the flow of gas passing  
the sharp corners of the inlet of Figure 8 experiences an  
abrupt change in velocity, as well as physical shape and

change in volume due to the pressure differential, and this results in the formation of recirculating gas cells (41). Philipossian goes on to indicate (col. 5, lines 40-45) that "[a]s has been determined by the prior work of others, the optimum shape for suppressing re-circulation cells of entering reactant gases is obtained by increasing the curvature of [t]he sidewalls of the nozzle in the direction of theoretical flow streamlines." Thus, the gas flow problem confronted by Philipossian is improved by replacing the sharp corners with a cone-like shape (40) (col. 5, lines 14-45). The cone-like shape (40) shown in Philipossian's Figs. 1 and 2 is like the appellants' embodiment of Fig. 3. Philipossian also describes an alternative embodiment (col. 3, lines 1-3), shown in Fig. 10, which is like the appellants' embodiment of Fig. 2.

Given the collective teachings found in the appellants' admitted prior art (specification, pages 1 and 2) and in Philipossian, it is our opinion that a person having ordinary skill in the art, knowledgeable of the gas flow problem resulting from the sudden pressure change between the pipe and

trap (appellants' prior art disclosure), would have found in Philipossian an obvious solution to that problem, i.e. a pipe tapering in the direction of theoretical flow stream lines that reduces the pressure of the vapor before entry thereof into the trap chamber (Philipossian's Figs. 1, 2, 9 and 10) rather than a pipe ending in sharp corners (Philipossian's Fig. 8 and appellants' admitted prior art). Thus, it would have been obvious to provide the chemical vapor deposition trap of the admitted prior art with a tapered pipe outlet coupled to the inlet of the trap chamber, following the teaching of Philipossian.

Claims 2 and 9 recite the additional limitation that the first pipe is linearly tapered. This limitation would have been suggested by Philipossian's cone-like shape (40) (col. 5, line 19) which, as shown in Figs. 1 and 2, is linearly tapered.

While on page 4 of the appellants' brief it is indicated that they have enjoyed commercial success in practicing claim 1 of the present invention, we find that no evidence of such

commercial success has been submitted.

REMAND TO THE EXAMINER

Pursuant to 37 CFR § 1.196(a), this case is remanded to the examiner to determine whether dependent claims 3 through 7, 10 through 14, 17 and 18, should be rejected under 35 U.S.C. § 103 as unpatentable over appellants' prior art disclosure (specification, pages 1 and 2) in view of Philipossian with other known prior art.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1 through 14, 17 and 18 under 35 U.S.C. § 103 is reversed; a new 35 U.S.C. § 103 rejection of a claims 1, 2, 8 and 9 is entered pursuant to 37 CFR 1.196(b), and the application is remanded to the examiner for consideration of further prosecution of claims 3 through 7, 10 through 14, 17 and 18.

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 that, "[a] new ground of rejection shall not be considered final for purposes of judicial review."

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 (§ 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. . . .

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

This application, by virtue of its "special" status, requires immediate action, see MPEP § 708.01. (Seventh Edition, Rev. 1, February 2000).

REVERSED AND REMANDED 37 CFR § 1.196(b)

IRWIN CHARLES COHEN	)	
Administrative Patent Judge	)	
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	)	BOARD OF PATENT
CHARLES E. FRANKFORT	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
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