

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 KENNETH H. HEFFNER
and CURTIS W. ANDERSON

Appeal No. 1998-2643
Application 08/549,349

ON BRIEF

Before KIMLIN, WALTZ and JEFFREY T. SMITH, Administrative Patent Judges.

WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 32 through 41, which are the only claims remaining in this application (see the

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amendment dated June 13, 1997, Paper No. 9, entered as per the Advisory Action dated June 24, 1997, Paper No. 10; Answer, page 2).¹

According to appellants, the invention is directed to a method of applying multilayer coatings to a semiconductor integrated circuit by use of a thermal spray process for each coating (Brief, page 2). Appellants fail to state whether the claims stand or fall together and have not presented any specific, substantive arguments to the separate patentability of any individual claim (Brief, page 4). Pursuant to the provisions of 37 CFR § 1.192(c)(7)(1995), we select one claim from each group of claims rejected and decide this appeal as to each ground of rejection on the basis of this claim alone. Accordingly, we select claims 32 and 34 and review the examiner's rejections on the basis of these claims alone. A copy of illustrative claims 32 and 34 is attached as an Appendix to this decision.²

¹We note that the amendment dated Sep. 4, 1997, Paper No. 13, was refused entry in the Advisory Action dated Sep. 15, 1997, Paper No. 14.

²We note that the copy of claim 38 in the Appendix to the Brief, contrary to the Answer, page 3, ¶8, is incorrect. The

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The examiner has relied upon the following references as evidence of obviousness:

Lantz, II (Lantz)	5,258,334	Nov. 2, 1993
Haluska	5,290,354	Mar. 1, 1994

This merits panel relies upon the following reference, previously made of record, as support for a new ground of rejection pursuant to the provisions of 37 CFR § 1.196(b):

Duncan et al. (Duncan)	3,170,813	Feb. 23, 1965
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Claims 33-35 and 37 stand rejected under 35 U.S.C. § 112 as "the term 'selected' is vague and indefinite." Answer, page 4. Claims 32, 33, 40 and 41 stand rejected under 35 U.S.C. § 103 as unpatentable over Haluska (Answer, page 4). Claims 34-39 stand rejected under 35 U.S.C. § 103 as unpatentable over Haluska in view of Lantz (Answer, page 5). We reverse all of the examiner's rejections. Furthermore, we

words "one coating composition is selected from" have been deleted from the claim (see the amendment dated June 13, 1997, Paper No. 9). Furthermore, claim 38 as written in this application (*id.*) contains "wherein" and "35" interposed while claim 39 requires a ", and" after "teflon" in line 3 of the claim. See the specification, page 8, ll. 1-2. Upon the return of this application to the jurisdiction of the examiner, these matters should be corrected.

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enter a new ground of rejection pursuant to the provisions of 37 CFR § 1.196(b). Our reasons follow.

OPINION

A. *The Rejection under 35 U.S.C. § 112*

Claims 33-35 and 37 stand rejected under 35 U.S.C. § 112 by the examiner because "the term 'selected' is vague and indefinite." Answer, page 4.³ The examiner bears the initial burden of presenting a *prima facie* case of unpatentability, whether the rejection is based on prior art or any other ground. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). "The legal standard for definiteness [under section 112, ¶2] is whether a claim reasonably apprises those of skill in the art of its scope."

³We note that the examiner has not specified what paragraph of section 112 forms the basis for this rejection (see the Answer, page 4). However, the examiner did specify the basis for this rejection in the Final Rejection (see the Office action dated Apr. 22, 1997, Paper No. 8, page 2). Accordingly, we review this rejection under the requirements for the second paragraph of section 112.

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In re Warmerdam, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). The definiteness of the language employed in the claims must be analyzed, not in a vacuum, but always in light of the teachings of the prior art and the application disclosure as it would be interpreted by one of ordinary skill in the art. See *In re Angstadt*, 537 F.2d 498, 501, 190 USPQ 214, 217 (CCPA 1976).

The examiner has not presented any reasoning or evidence why the term "selected" is vague and indefinite and why one of ordinary skill in the art would not be apprised of the scope of a claim that contains this term. Therefore the examiner has not met the initial burden of presenting a *prima facie* case of unpatentability. Furthermore, the examiner has not replied to any of appellants' arguments against this rejection (Brief, pages 9-13; Reply Brief, page 5). Accordingly, the rejection of claims 33-35 and 37 under 35 U.S.C. § 112 is reversed.

B. The Rejections under 35 U.S.C. § 103

The examiner finds that Haluska teaches a method of forming a ceramic coating on a substrate such as an electronic

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device by coating the substrate with a solution of a solvent, hydrogen silsesquioxane resin and a modified ceramic oxide precursor, evaporating the solvent, and ceramifying by heating to 40 to 1000°C. (Answer, paragraph bridging pages 4-5). The examiner further finds that Haluska teaches that additional passivation and barrier layer coatings may be deposited by methods including chemical vapor deposition (CVD) and plasma-enhanced chemical vapor deposition (PECVD) (Answer, page 5). The examiner states that it is "well recognized" in the coating art that the coating material applied by plasma coating techniques is "liquified" or made molten prior to application to the substrate (Final Rejection, Paper No. 8, page 4, paragraph two). From these findings, the examiner concludes that it would have been obvious to have applied the coating materials of Haluska in a molten state (Answer, page 5). The examiner has construed the claims as "broad enough" to read upon the primer coating by evaporation and subsequent coatings by PECVD as taught by Haluska (Answer, page 8).

Implicit in our review of the examiner's obviousness analysis is that the claim must first have been correctly construed to define the scope and meaning of each contested

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limitation. See *Gechter v. Davidson*, 116 F.3d 1454, 1460 n.3, 43 USPQ2d 1030, 1035 n.3 (Fed. Cir. 1997). The method of claim 32 on appeal requires that the particles of a first and second coating composition are applied to a flame stream which is at a temperature sufficient to place the particles in a molten state before passing the flame stream across the integrated circuit in successive passes to build a specific thickness layer. The method of claim 32 does recite the transition term "comprising" which opens the claim to additional unrecited elements and steps. See *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1271, 229 USPQ 805, 812 (Fed. Cir. 1986).

In view of the claim construction discussed above, we determine that the examiner has not established a *prima facie* case of obviousness in view of Haluska. Although the evaporative primer coating deposited by Haluska is not excluded from the claimed subject matter on appeal, the examiner has not presented any convincing evidence or reasoning why the CVD or PECVD disclosed by Haluska for subsequent passivation and barrier coatings would have

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suggested the claimed limitations to one of ordinary skill in the art at the time of appellants' invention. By definition, CVD or PECVD involves the deposition of coatings from the reduction or disassociation of vapors of volatile stable chemical compounds.⁴ The examiner has not presented any evidence or reasoning that plasma coating processes as taught by Haluska apply the coating material in molten form, much less shown the flame stream process steps and two coatings as required by claim 32 on appeal.

For the foregoing reasons, we determine that the examiner has failed to present a *prima facie* case of obviousness. Accordingly, the rejection of claim 32, and claims 33, 40 and 41 which stand or fall with claim 32, under 35 U.S.C. § 103 over Haluska is reversed.

Claims 34-39 stand rejected under section 103 over Haluska in view of Lantz (Answer, page 5). Lantz was applied by the examiner to show ceramic coating compositions such as those claimed by appellants (Answer, sentence bridging pages

⁴See Kirk-Othmer, *Encyclopedia of Chemical Technology*, 3rd ed., Vol. 10, pp. 266-67, 1980, and Vol. 20, pp. 47-48, 1982, John Wiley & Sons.

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5-6). Accordingly, Lantz does not remedy the deficiency discussed above with respect to the rejection over Haluska. Therefore the rejection of claims 34-39 under 35 U.S.C. § 103 over Haluska in view of Lantz is reversed.

C. The New Ground of Rejection under 37 CFR § 1.196(b)

Pursuant to the provisions of 37 CFR § 1.196(b), we enter a new ground of rejection of claims 40-41 under 35 U.S.C. § 103 as unpatentable over Duncan.

Independent claim 40 recites a coating method where the particles are not specified nor is the substrate. This claim requires only selecting particles such that they become molten at temperature T1 and produce an impact force not exceeding a specific level when striking a surface at velocity V1, heating the particles to temperature T1, accelerating the particles to velocity V1 towards a surface, and making successive passes with this particle spray. Claim 41 depends on claim 40 and recites the size of the particles and that the surface is a circuit.

Duncan discloses a method for encapsulating semiconductors where a refractory coating is applied by means

of a plasma jet spray (col. 1, ll. 11-12; col. 2, ll. 13-14). The refractory particles are heated to a high temperature such that they are molten and driven at a high velocity such that the particles are embedded in the thermoelectric material (col. 2, ll. 20-25; 37-37-41). Although a single plasma jet spray coating is "desirable," second and subsequent coatings are taught by Duncan (col. 2, ll. 33-35; 50-56). Duncan specifically encapsulates thermoelements but generically describes this coating method as applicable to semiconductors (col. 1, ll. 13-20).

From the findings set forth above, Duncan discloses selecting particles such that they become molten at a temperature T_1 and produce an impact force not exceeding a specific level when striking the surface at velocity V_1 , heating the particles to temperature T_1 , and accelerating the particles to velocity V_1 . Furthermore, Duncan teaches the application of at least a second coating thus suggesting successive passes of the plasma jet spray (col. 2, ll. 50-56).

The actual size of the refractory particles is not disclosed by Duncan. However, it would have been well within the ordinary skill in the art to have selected particles which

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form a plasma jet spray at the conditions taught by Duncan. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). The "semiconductor device" disclosed by Duncan is generic to a "circuit" as recited in claim 41 on appeal and, as such, Duncan would have suggested circuit encapsulation to one of ordinary skill in the art. Note that Duncan teaches that the high temperatures and velocities do not deleteriously affect the thermoelectric materials of the substrate (col. 2, ll. 28-32).

For the foregoing reasons and based on the findings set forth above, it would have been obvious to one of ordinary skill in the art at the time of appellants' invention to have used successive passes of the plasma jet spray in the process of Duncan, as well as to have determined the particle size of the refractory and applied the encapsulation to a circuit. Accordingly, claims 40-41 are rejected under 35 U.S.C. § 103 as unpatentable over Duncan.

D. Summary

The rejection of claims 33-35 and 37 under 35 U.S.C. § 112 is reversed. The rejection of claims 32, 33, 40 and 41

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under 35 U.S.C. § 103 over Haluska is reversed. The rejection of claims 34-39 under 35 U.S.C. § 103 over Haluska in view of Lantz is reversed. Pursuant to the provisions of 37 CFR § 1.196(b), we enter a new ground of rejection of claims 40-41 under 35 U.S.C. § 103 over Duncan.

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."

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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
(§ 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).

REVERSED-37 CFR § 1.196(b)

EDWARD C. KIMLIN

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THOMAS A. WALTZ)	
Administrative Patent Judge)	APPEALS AND
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APPENDIX

32. A method of forming a multilayer coating on a semiconductor integrated circuit device comprising the steps of:

preparing first particles of a first coating composition;

applying the first particles to a flame stream which is at a temperature sufficient to place the first particles in a molten state;

building a specific thickness first layer of said first coating composition by passing the flame stream across the integrated circuit in successive passes over the integrated circuit;

preparing second particles of a second coating composition;

applying the second particles to a flame stream which is at a temperature sufficient to place the second particles in a molten state;

building a specific thickness of a said second coating composition on said first layer by passing the flame stream across the integrated circuit in successive passes over the integrated circuit; and

selecting the size of said first and second particles so that the particles attain a molten state in the flame stream and produce an impact force less than a specific level when striking the circuit in a molten state.

34. The method of claim 32 wherein one of said first and second coating compositions comprises a material that attenuates energy above the visible spectrum and said one coating has a thickness on the

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integrated circuit selected to attenuate said energy
to by a selected magnitude.