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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(2) is not binding precedent of the Board.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. 15

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LISA A. TARTE, WAYNE L. BONDE,
PAUL G. CAREY, ROBERT J. CONTOLINI, and ANTHONY M. MCCARTHY

Appeal No. 1996-3534
Application 08/323,410¹

ON BRIEF

Before PAK, WARREN and OWENS, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1 through 7 and 15 through 17. Claims 8 through 13, have been indicated by the examiner to be allowable. Claims 1, 7, 8, 15 and 16 are illustrative of the claims on appeal and the other claims of record:

1. In a process for forming a seed layer for selective metal deposition, the improvement comprising:

¹ Application for patent filed October 14, 1994.

forming insulating fillets along the perimeter regions of the seed layer between the seed layer and an underlying layer for preventing electroplating of material adjacent the perimeter regions on the seed layer.

7. In a process for selective metal deposition using laser writing to form activated seed layers for electroplating of a conductive metal thereon, the improvement comprising:

preventing conductor shorting due to the electroplating by providing means for protecting metallic material located adjacent the activated seed layer from being electroplated.

8. The improvement of Claim 7, wherein the means is provided by forming electrically insulating fillets along edge crevices of the activated seed layer for insulating any exposed conductive material adjacent the perimeter regions of the activated seed layer.

15. An integrated circuit component including a substrate, at least one integrated circuit chip and at least one metallic interconnect formed by electroplating conductive material on an activated seed layer, including means for protecting conductive material located adjacent a perimeter of the activated seed layer from shorting due to electroplating of the conductive metallic interconnect.

16. The integrated circuit component of Claim 15, wherein said means comprises at least one fillet of insulating material.

According to appellants, appealed claims 1 through 14 encompass processes wherein the process of preparing a seed layer for selective metal deposition taught in Bernhardt is improved upon by “providing sufficient insulation between the activated seed layer and the underneath perimeter region of the components on which the seed later is formed to prevent shorting of the conductor lines via the perimeter regions during subsequent electroplating” (specification, page 3, lines 3-18). Claims 15 through 17 encompass an integrated circuit component that includes at least one metallic interconnect formed by electroplating conductive material on an activated seed layer, and means for protecting conductive material located adjacent a perimeter of the activated seed layer from shorting due to electroplating, which means can comprise at least one fillet of insulting material.

The references relied on by the examiner are:

Ipri et al. (Ipri)	4,965,646	Oct. 23, 1990
Bernhardt	5,098,526	Mar. 24, 1992

The examiner has rejected appealed claims 1 through 6 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Ipri. The examiner has also rejected appealed claims 7 and 15 through 17 under 35 U.S.C. § 102(b) as anticipated by or, in

the alternative, under 35 U.S.C. § 103 as obvious over Bernhardt. We reverse.

Under the provisions of 37 CFR § 1.196(b) (1997), we enter a new ground of rejection of claims 1 through 17, inclusive of claims 8 through 14 indicated to be allowable by the examiner, under 35 U.S.C. § 103 as being unpatentable over the combined teachings of Bernhardt and Ipri.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the examiner's answer and to appellants' principal and reply briefs for a complete exposition thereof.

Opinion

We begin our consideration of the issues in this appeal by determining the invention encompassed by the appealed claims and the other claims of record as they stand before us, which claims include means-plus-function language, mindful that we must give the broadest reasonable interpretation to the terms of the appealed claims consistent with appellants' specification as it would be interpreted by one of ordinary skill in this art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1189, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). We find that claim 1 is drawn in "Jepson" format to the specified improvement "[i]n a process for forming a seed layer for selective metal deposition." See generally *In re Ehrreich*, 590 F.2d 902, 904, 200 USPQ 504, 510 (CCPA 1979). Consequently, it is elementary claim construction that the claimed process of claim 1 requires the *formation* of a seed layer, wherein "insulating fillets" are *formed* "along the perimeter regions of the seed layer between the seed layer and an underlying layer," as seen from the plain language of the claim in a manner consistent with the construction that one of ordinary skill in this art would have given the terms of the claim in light of appellants' specification (e.g., page 2, lines 19-21).

We further find that claim 7 is also drawn in "Jepson" format to the specified improvement "[i]n a process for selective metal deposition using laser writing to form activated seed layers for electroplating of a conductive material thereon." Thus, we find that the claimed process of claim 7 requires the *formation* of activated seed layers using laser writing for electroplating thereon of a

conductive metal, wherein “means” are provided “for protecting metallic material located adjacent the activated seed layer from being electroplated.” We further find that claim 8 further limits claim 7 by specifying that the “means” is “electrically insulating fillets” formed “along edge crevices of the activated seed layer for insulating any exposed conductive material adjacent the perimeter regions of the activated seed layer.” Indeed, when we look to the specification for the structure, material or acts corresponding to the “means” specified in claim 7, we find the structure formed from materials by acts as specified in claim 8 and claims dependent on claim 8. In similar manner, claim 15 specifies an integrated circuit component that includes the presence of “means for protecting conductive material located adjacent a perimeter of the activated seed layer from shorting due to electroplating of the conductive metallic interconnect,” which structure is disclosed in the specification to be “at least one fillet of insulating material” formed from the materials specified in claim 16 and in claim 17 dependent thereon.

Donaldson, 16 F.3d at 1193, 29 USPQ2d at 1848.

Accordingly, we have compared claims 1 through 6, as we have construed them above, with *Ipri* and find that this reference neither describes the claimed process within the meaning of § 102(b) nor renders the claimed process obvious within the meaning of § 103 because it does not describe or suggest a process of selective metal deposition which includes the *formation* of a “seed layer.” Indeed, there is no teaching in *Ipri* that “second conductive layer **21**” or any other layer is deposited on a “seed layer” which enables selective metal deposition. In comparing claims 7 and 15 through 17, as we have construed them above, with *Bernhardt*, we find that this reference neither describes the claimed processes and products within the meaning of § 102(b) nor renders the claimed processes and products obvious within the meaning of § 103 because it does not describe or suggest a process in which insulating fillets are provided to obtain a product containing same. Indeed, as described by the examiner (answer, page 6), *Bernhardt* provides merely “space” at the “perimeter of the activated seed layer.”

Accordingly, we reverse *all* of the grounds of rejecting advanced on appeal by the examiner.

Under the provisions of 37 CFR § 1.196(b) (1997), we enter a new ground of rejection of claims 1 through 17 under § 103 as being unpatentable over the combined teachings of *Bernhardt* and

Ipri. Appellants admit that their invention is an improvement in the processes of selective metal deposition by formation of a seed layer by an energy source, such as a laser, and in the products thereof taught in Bernhardt in that it addresses the problem of shorting between the conductor lines that can occur in practicing the Bernhardt process when there is “insufficient insulation material to insulate the metal layer underneath the perimeter region of the conductors from subsequent electroplating” (specification, page 2, lines 5-10; see also principal brief, page 9, first paragraph). Based on the record before us, we find that one of ordinary skill in this art would have recognized this problem in the routine practice of the Bernhardt process in preparing integrated circuit components (e.g., col. 3, lines 31-43) and thus would have been motivated to solve it. See *In re Nomiya*, 509 F.2d 566, 574, 184 USPQ 607, 613 (CCPA 1975) (“The significance of evidence that a problem was known in the prior art is, of course, that knowledge of a problem provides a reason or motivation for workers in the art to apply their skill to its solution.”); *In re Ludwig*, 353 F.2d 241, 243, 147 USPQ 420, 421 (CCPA 1965); *In re Goodman*, 339 F.2d 228, 232-33, 144 USPQ 30, 33-34 (CCPA 1964).

Accordingly, one of ordinary skill in the art of preparing integrated circuit components would have looked to this art area and analogous art areas for a solution to the problem of depositing metals in such manner as to prevent the deposited metal forming the conductor from contacting other metal layers. We find that one of ordinary skill in this art would have recognized that the same problem of maintaining a separation between a deposited metal and other metal layers was addressed in Ipri wherein different metal layers are deposited in the formation of solid state switching and conductor crossover structures for liquid crystal displays (col. 3, lines 51- 58; see also, e.g., col. 1, and col. 2, line 44, to col. 3, line 23). The solution to the problem taught by Ipri is the formation of “[d]ielectric stringers **33**” which provide removable insulation between the layers (col. 3, line 59, to col. 4, line 5). We note that appellants admit that the “[Ipri] uses ‘stringers (insulating fillets) as claimed” (principal brief, page 8). Indeed, we find that Ipri constitutes analogous prior art because it is from the same filed of endeavor as Bernhardt and the claimed invention, that is, the formation of circuitry by metal deposition, and is further directed to the same problem of maintaining a separation between a deposited metal and other metal layers with which the claimed invention is involved. *In re Clay*, 966 F.2d 656,

659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992).

Therefore, we find that the combined teachings of Bernhardt and Ipri would have *prima facie* provided one of ordinary skill in this art with both the suggestion to use insulating fillets as taught by Ipri to maintaining a separation between a metal deposited on a seed layer and other metal layers in the process of preparing an integrated circuit component taught by Bernhardt and the reasonable expectation of preventing shorting due to electroplating of metal adjacent the perimeter regions of the seed layer. *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988); *In re O'Farrell*, 853 F.2d 894, 902-04, 7 USPQ2d 1673, 1680-81 (Fed. Cir. 1988); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

In view of the *prima facie* case of obviousness established over the combined teachings of Bernhardt and Ipri as we have applied them above, the burden of going forward has shifted to appellants to submit argument and/or evidence in rebuttal. *See generally In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

We have carefully considered appellants' arguments insofar as they apply to the new ground of rejection that we have entered above. In finding that Ipri is analogous prior art, we carefully considered that this reference "is not concerned with preventing conductor shorting due to electroplating," as pointed out by appellants, (principal brief, page 8). We are also aware of the examiner's statement that in the "context" of claims 8 through 14 wherein "laser writing is used to form activated seed layers for electroplating," "an additional photolithographic step is not obvious because laser writing technology is distinct from photolithographic technology as a method for making conductive patterns" (Office action of March 2, 1995, Paper No. 3; pages 4-5). However, we find no evidence on this record that either the method of application of metal to a substrate capable of receiving the same or the method of forming a pattern for the deposition of the metal either establishes that Ipri is non-analogous art or patentably distinguishes the claimed invention as a whole as encompassed by the appealed claims over the combined teachings of Bernhardt and Ipri.

Accordingly, based on our consideration of the totality of the record before us, we have

weighed the evidence of obviousness found in the combined teachings of Bernhardt and Ipri with appellants' countervailing evidence of and argument for nonobviousness to the extent that the same apply to the new ground of rejection and, on this record, conclude that, on balance, the claimed invention as a whole encompassed by claims 1 through 17 would have been *prima facie* obvious as a matter of law under 35 U.S.C. § 103. Thus, the burden of going forward as to the new ground of rejection of claims 1 through 17 that we have entered above remains with appellants. *Johnson, supra*; *Piasecki, supra*.

In summary, we have reversed the ground of rejection of claims 1 through 6 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Ipri, and the ground of rejection of appealed claims 7 and 15 through 17 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Bernhardt. Under 37 CFR § 1.196(b), we have newly rejected claims 1 through 17 under 35 U.S.C. § 103 as unpatentable over the combined teachings of Bernhardt and Ipri.

The examiner's decision is reversed.

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

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extended under 37 CFR § 1.136(a).

Reversed

37 CFR § 1.196(b)

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Administrative Patent Judge)	
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CHARLES F. WARREN)	BOARD OF PATENT
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