

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. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KARL M. ROBINSON

Appeal No. 2000-0770
Application No. 08/631,638

HEARD: January 22, 2002

Before RUGGIERO, DIXON, and LEVY, Administrative Patent Judges.
RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal from the final rejection of claims 1-35, 46, and 47. Claims 36-45 have been canceled. An amendment filed January 22, 1999 after final rejection, which did not amend the claims, was approved for entry by the Examiner (Advisory action mailed February 11, 1999, Paper No. 13).

Appeal No. 2000-0770
Application No. 08/631,638

The disclosed invention relates primarily to thin film capacitors on integrated circuits. The capacitor structure includes two electrodes and a dielectric material having a high dielectric constant, the dielectric material being isolated from the electrodes by an organic material. Appellant asserts at page 3 of the specification that, although the invention is primarily directed to capacitors, the organic material can be used to isolate any dielectric material used in an integrated circuit.

Claim 1 is illustrative of the invention and reads as follows:

1. A capacitor on an integrated circuit device, the capacitor comprising:

- (a) a first electrode;
- (b) a second electrode; and

(c) a high dielectric material having a dielectric constant of at least about 10 wherein the high dielectric material is isolated from the first and second electrodes by an organic material; wherein the dielectric material and the organic material are distinct materials and form at least one layer between the first and second electrodes.

The Examiner relies on the following prior art:

Robbins	4,695,921	Sep. 22, 1987
---------	-----------	------------------

Appeal No. 2000-0770
Application No. 08/631,638

Takahashi	5,039,589	Aug. 13, 1991
Stupp et al. (Stupp)	5,412,144	May 02, 1995
Rostoker et al. (Rostoker)	5,744,399	Apr. 28, 1998

(filed Nov. 13, 1995)

Claims 1-35, 46, and 47 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the Examiner offers Robbins in view of Rostoker with respect to claims 1-4, 11-17, and 22-35, adds Stupp to the basic combination with respect to claims 5-7 and 18-20, and adds Takahashi to the basic combination with respect to claims 8-10, 21, 46, and 47.

Rather than reiterate the arguments of Appellant and the Examiner, reference is made to the Briefs¹ and Answer for the respective details.

OPINION

¹ The Appeal Brief was filed May 24, 1999 (Paper No. 17). In response to the Examiner's Answer dated June 21, 1999 (Paper No. 18), a Reply Brief was filed August 26, 1999 (Paper No. 19), which was acknowledged and entered by the Examiner as indicated in the communication dated September 29, 1999 (Paper No. 21).

Appeal No. 2000-0770
Application No. 08/631,638

We have carefully considered the subject matter on appeal, the rejection advanced by the Examiner, the arguments in support of the rejection and the evidence of obviousness relied upon by the Examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellant's arguments set forth in the Briefs along with the Examiner's rationale in support of the rejection and arguments in rebuttal set forth in the Examiner's Answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims

1-35, 46, and 47. Accordingly, we reverse.²

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837

² The Examiner may wish to take note of the issuance of U.S. Patent No. 6,174,780 on January 16, 2001 as a result of a divisional application (09/139,918 filed August 16, 1998) of the instant application.

Appeal No. 2000-0770
Application No. 08/631,638

F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed.

Appeal No. 2000-0770
Application No. 08/631,638

Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

With respect to independent claims 1 and 14, the Examiner, as the basis for the obviousness rejection, proposes to modify the capacitor structure disclosure of Robbins, which lacks an explicit teaching of isolating the dielectric material from the two electrodes of the capacitor structure. To address this deficiency, the Examiner turns to Rostoker which discloses the isolation of dielectric layers from electrode layers with organic material. According to the Examiner, the skilled artisan would have been motivated and found it obvious to modify Robbins to include the organic isolating layers of Rostoker "... to improve the structure by providing the organic layer as isolation." (Answer, page 3).

In response, Appellant asserts several arguments in support of their position that the Examiner has not established proper motivation for the proposed combination of references so as to set forth a prima facie case of obviousness. After careful

Appeal No. 2000-0770
Application No. 08/631,638

review of the applied prior art in light of the arguments of record, we are in agreement with Appellant's position as stated in the Briefs.

It is our view that, while a showing of proper motivation does not require that a combination of prior art teachings be made for the same reason as Appellant to achieve the claimed invention, we can find no motivation for the skilled artisan to add Rostoker's isolating layer to the capacitor structure of Robbins. According to the disclosure of Rostoker, the removal of the fullerene component from the low dielectric constant insulating layer causes a porous structure to result. The isolating or encapsulating layers are needed to protect against the migration of impurities or dopants through the resulting porous insulating layer to the surface of the dielectric and causing an undesirable interaction with the conductive layers. (Rostoker, column 6, lines 10-40). There is nothing in the disclosure of Robbins to indicate that impurity or dopant migration and the interaction of dielectric and electrode materials, the problems addressed by Rostoker, were ever a concern. It is our opinion that the only basis for applying the teachings of Rostoker to the capacitor structure of Robbins

Appeal No. 2000-0770
Application No. 08/631,638

comes from an improper attempt to reconstruct Appellant's invention in hindsight.

We further find to be persuasive Appellant's contention (Brief, page 9) that the skilled artisan, seeking to improve the capacitance characteristic of a capacitor structure with relatively high dielectric materials such as in Robbins, would unlikely be motivated to turn to the teachings of Rostoker. We agree with Appellant that, in contrast to Robbins' desire to increase capacitance and provide a dielectric structure with an increased dielectric constant, Rostoker's disclosure is directed to the lowering of capacitance in semiconductor wafer structures by lowering the dielectric constant of insulating material layers. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992).

We are further of the opinion that even assuming, arguendo, that proper motivation were established for the Examiner's proposed combination of Robbins and Rostoker, the resulting structure would not meet the specific requirements of appealed

Appeal No. 2000-0770
Application No. 08/631,638

independent claims 1 and 14. Each of claims 1 and 14 requires a capacitor structure with a dielectric material having a dielectric constant "... of at least about 10." We find no disclosure in either Robbins or Rostoker of the use of any material, and the Examiner has pointed to none, that would result in a dielectric with the required dielectric constant.

Accordingly, since the Examiner has not established a prima facie case of obviousness, the rejection of independent claims 1, and 14, as well as claims 2-13, 15-24, and 46 dependent thereon, over the combination of Robbins and Rostoker is not sustained.

Turning to a consideration of the Examiner's 35 U.S.C. § 103 rejection of independent claim 25 and its dependent claims 26-35 and 47, we do not sustain this rejection as well. As recognized by both Appellant and the Examiner, independent claim 25, in contrast to claims 1 and 14 discussed supra, does not recite the presence of electrodes. As asserted by Appellant (Reply Brief, page 2), however, contrary to the Examiner's contention at page 9 of the Answer that only a "high dielectric material" is recited in the claim, it is apparent from a reading of the language of claim 25 that there is a specific recitation

Appeal No. 2000-0770
Application No. 08/631,638

of a structure in which a dielectric material is isolated by an organic material and in which the dielectric material has a dielectric constant of "at least about 10." Our reviewing courts have held that, in assessing patentability of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). As discussed earlier, the Examiner has not established how any of the materials used in the Robbins and Rostoker references would result in a dielectric structure having the required dielectric constant.

As a final commentary, we find unpersuasive the Examiner's suggestion (Answer, page 9) that Robbins provides a teaching of an inherent isolation of the dielectric material from the electrode. According to the Examiner, the addition of ceramic particles to the dielectric material in Robbins (column 3, lines 4-6) results in a structure in which the particles are inherently isolated from each other and from any surface in which they would be deposited. To establish inherency, evidence

Appeal No. 2000-0770
Application No. 08/631,638

must make clear that the missing descriptive matter is necessarily present in the thing described in the reference and would be recognized as such by persons of ordinary skill. In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) citing Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." Id. citing Continental, 948 F.2d at 1269, 20 USPQ2d at 1749. We find no basis in the disclosure of Robbins for the need for isolation, nor any other evidence of record, that would support the Examiner's assertion of inherency.

We have also reviewed the disclosures of the Stupp and Takahashi references applied by the Examiner to address the features of several dependent claims directed to the composition of particular organic material used for the isolation layer. We find nothing, however, in either of these disclosures that would overcome the innate deficiencies of the Robbins and Rostoker references discussed supra.

Appeal No. 2000-0770
Application No. 08/631,638

In conclusion, it is our opinion that, since all of the claimed limitations are not disclosed or suggested by the applied prior art references, the Examiner's 35 U.S.C. § 103 rejection of all of the claims on appeal cannot be sustained. Therefore, the decision of the Examiner rejecting claims 1-35, 46, and 47 is reversed.

Appeal No. 2000-0770
Application No. 08/631,638

REVERSED

JOSEPH F. RUGGIERO)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
JOSEPH L. DIXON)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
STUART S. LEVY)	
Administrative Patent Judge)	

JFR/lp

Appeal No. 2000-0770
Application No. 08/631,638

CLARIANT CORPORATION
INDUSTRIAL PROPERTY DEPT.
4331 CHESAPEAKE DRIVE
CHARLOTTE, NC 28216

Letty

JUDGE RUGGIERO

APPEAL NO. 2000-0770

APPLICATION NO. 08/631,638

APJ RUGGIERO

APJ DIXON

APJ LEVY

DECISION: **REVERSED**

PREPARED: Nov 13, 2002

OB/HD

PALM

ACTS 2

DISK (FOIA)

REPORT

BOOK