

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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 RANKO SCEPANOVIC,
JAMES S. KOFORD,
EDWIN E. JONES,
DOUGLAS B. BOYLE, and
MICHAEL D. ROSTOKER

Appeal No. 97-2053
Application 08/229,624¹

ON BRIEF

Before KRASS, JERRY SMITH, and FLEMING, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-27, which constitute all the claims in the application. In the answer the examiner withdrew the pending rejection of claims 1-27 and added a

¹ Application for patent filed April 19, 1994.

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single new ground of rejection of claims 1, 15 and 17. Claims 2-14, 16 and 18-27 were indicated as now containing allowable subject matter. Accordingly, this appeal is now directed to the rejection of claims 1, 15 and 17.

The disclosed invention pertains to a computing method and apparatus for computing a cost factor associated with the placement of cells on an integrated circuit chip.

Representative claim 1 is reproduced as follows:

1. A computing apparatus for computing a cost factor of a placement of cells on an integrated circuit chip and interconnect nets for said placement, comprising:

a boulder for constructing bounding boxes around said interconnect nets respectively; and

a processor for computing overlap of said bounding boxes and computing said cost factor as a first predetermined function of said overlap.

The examiner cites the following references:

Antreich et al. (Antreich)	5,267,176	Nov. 30, 1993
Kim	5,398,195	Mar. 14, 1995 (filed Feb. 21, 1992)
Noble	5,392,222	Feb. 21, 1995 (filed Dec. 30, 1991)

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Claims 1, 15 and 17 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Noble taken alone.

Rather than repeat the arguments of appellants or the examiner, we make reference to the briefs and the answers for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the examiner 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, the appellants' 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 answers.

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

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ordinary skill in the art the obviousness of the invention as set forth in claims 1, 15 and 17. Accordingly, we reverse.

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 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, 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,

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1577, 221 USPQ 929, 933 (Fed. 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).

According to the examiner, Noble teaches a means for constructing bounding boxes around the interconnect nets of the integrated circuit and a means for computing the amount of overlap of the bounding boxes [answer, pages 3-4]. The examiner concludes that based on this disclosure, it would have been obvious to the artisan to compute the cost factor as a predetermined function of bounding box overlap because it would enhance the field of view [Id.].

Appellants argue that Noble fails to teach or suggest the following features set forth in each of independent claims 1, 15 and 17:

- (1) performing a placement of cells on an integrated circuit chip;
- (2) computing a cost factor or congestion for the placement of cells on an integrated circuit chip;

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(3) constructing bounding boxes around the interconnect nets for the cell placement; and

(4) computing the cost factor for the cell placement as a first predetermined function of the bounding box overlap;

[see reply brief, pages 4-6].

The examiner responds that the claims do not require placing cells on the integrated circuit [supplemental answer, page 1]. The examiner notes that "[t]he claims require computing overlap of said bounding boxes and the cost factor as a function of the overlap (see claims 1, 15 and 17), but not cost factor for the placement of cells on an integrated circuit (IC) chip as cited" [*Id.*, page 3]. Finally, the examiner reinforces this position by stating that "[t]he rejected claims 1, 15 and 17 do not require locating cells on a surface of an IC chip" [*Id.*].

In our view, the examiner has not properly considered all of the claim recitations. Although we can agree that Noble does broadly construct bounding boxes around

interconnect nets, and Noble does broadly compute an overlap of these bounding boxes, we cannot agree that Noble suggests the computation of the cost factor as set forth in the claims on appeal. Any cost factor in Noble is related to the best location of a field of view for accessing a specific portion of an integrated circuit. Noble has absolutely nothing to do with determining the placement of cells on an integrated circuit chip. Noble deals with an integrated circuit which has already been designed and manufactured.

Claims 1 and 17 recite the function of "computing said cost factor as a first predetermined function of said overlap." The phrase "said cost factor" refers to a cost factor defined in the preamble of each of these claims. Specifically, each of claims 1 and 17 defines the cost factor in terms of "a placement of cells" on an IC chip or on a surface. Therefore, the computation of this cost factor must also be related to such cell placement. As noted above, Noble has nothing to do with computing cost factors which relate to such cell placement. Thus, the artisan would not have found

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it obvious to compute cost factors related to cell placement in view of the teachings of Noble.

Claim 15 is similar to claims 1 and 17 except that the cost factor is recited as a "congestion" in the placement of cells on an integrated circuit chip and the claim recites "computing said congestion." For the same reasons discussed above, the computation of claim 15 must be in relation to a placement of cells on an integrated circuit chip. Since Noble has nothing to do with such placement, the invention of claim 15 would not have been obvious in view of the teachings of Noble.

In summary, the examiner's position that the claims on appeal do not require the placement of cells on an integrated circuit chip is in error. The definition of cost factor or congestion in the appealed claims requires that the cost factor or congestion be related to the placement of cells on an integrated circuit chip. For reasons discussed above, Noble does not teach or suggest such a computation of cost or congestion. Therefore, we do not sustain the rejection of claims 1, 15 and 17 based on the teachings of Noble.

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In conclusion, the decision of the examiner rejecting
claims 1, 15 and 17 is reversed.

REVERSED

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Administrative Patent Judge)	
)	
)	
Jerry Smith)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
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