The opinion in support of the decision being entered today was not
written for publication and is not binding precedent of the Board.

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte BING CHEN, SCOTT W. GOULD
MARK KWANG-JEN HSU, PTRICK M RYAN
and ERICH C. SCHANZENBACH

Appeal No. 2006-2819
Application No. 10/980,575

ON BRIEF

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

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-6 and 19-21.

The invention pertains to a method for distributing power in an integrated circuit having voltage islands. In particular, a first power grid is generated for a voltage island on metal levels 1 to N-1. Then, a second power grid is generated on metal levels N and above. A bounding region of the second robust power grid is determined, and, finally, the shortest distance connections from a set of power sources are routed to the second power grid.

Representative independent claim 1 is reproduced as follows:

1. A method for performing power routing on a voltage island within an integrated circuit chip, said method comprising:

generating a first robust power grid for a voltage island on metal levels 1 to N-1;

generating a second robust power grid for said voltage island on metal levels N and above; and

routing a plurality of shortest distance connections from a plurality of power sources to said second robust power grid.

The examiner relies on the following reference:

Gould et al. (Gould) 6,493,859 Dec. 10, 2002

Claims 1-6 and 19-21 stand rejected under 35 U.S.C. § 102(e) as anticipated by Gould

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

We REVERSE as to the rejection of claims 1-6, but AFFIRM as to the rejection of claims 19-21.

The examiner contends that Gould's step 155 in Figure 2, wherein power networks are divided into segments, is the claimed generation of a first power grid, and that step 170 in Figure 2 of Gould, the division of segments into pin shapes, is indicative of the generation of a second power grid.

Even assuming, arguendo, the highly debatable point that Gould's segments may be considered a first power grid and that Gould's pin shapes may be considered a second power grid, the examiner has still not established a prima facie case of anticipation of the instant claimed subject matter. Claim 1 requires that the first power grid is generated "on

metal levels 1 to N-1" and that the second power grid is generated "on metal levels N and above." No such generation of these power grids on such levels is taught by Gould.

The examiner appears to rely on column 4, lines 10-13, of Gould, wherein it is disclosed that in a multilevel design, certain sections may be physically placed at wiring levels M1, M3 or M5, and other sections may be physically placed at wiring levels M2, M4 or M6. However, we find no description, in this recitation of placing various sections at interleaving wiring levels, of generating a first power grid on N-1 sequential metal levels and generating a second power grid on the next N+ sequential levels, as claimed.

Accordingly, we will not sustain the rejection of claims 1-6 under 35 U.S.C. § 102 (e).

We reach the opposite decision with regard to independent claim 19.

Independent claim 19 does not recite the generation of first and second power grids on sequential metal levels 1 to N-1 and N and above, but the claim does recite, "determining a bounding region of said robust power grid."

The examiner's initial reasoning was to point to column 4, lines 66-67, and Figure 10 of Gould for such a "bounding region." The cited column 4 portion of the reference merely describes pin shape connections created between the pin shapes and power service terminals (PSTs) and says nothing about any "bounding region." The examiner then

explained in the response section of the answer (at page 5) that the examiner considers the pin shapes 240, into which power grid sections 235 are divided in Gould's Figure 10, to define "bounding regions" of the power grid sections 235, as claimed.

Our review of Gould finds that in Figure 10, grid sections 235 are divided into pin shapes 240. It does appear that these pin shapes form "boundaries" within grid sections 235 and we find the examiner's interpretation to be broad, yet reasonable.

Appellants' argument in this regard (page 6 of the principal brief) is merely that Gould's "segments are not directly related to the power grids. But importantly, none of the cited passage is related to 'determining a bounding region of said robust power grid,' as claimed." We disagree.

At column 4, line 63, Gould states that "the power network is a grid." Therefore, the grid sections 235 in Gould's Figure 10 are clearly directly related to a "power network." Grid sections 235 in Gould are therefore sections, or segments, of a power network. Thus, it appears to us that appellants' argument that Gould's segments are not directly related to the power grids is erroneous.

The pin shapes 240 in Gould do appear to set forth boundaries in the power grid sections 235, at least as broadly claimed. We note that "a bounding region," as claimed, is never fully explained in the instant specification. The only disclosure of such a bounding region is with regard to the flow diagram in Figure 3, viz. step 33. Paragraph

[0022] of the description in the specification refers to the "bounding region" but never explains what this entails. Accordingly, in view of the broad recitation of "determining a bounding region" in the claim and the lack of any specific explanation of this term in the specification, we find that Gould's disclosure of pin shapes 240, appearing to set boundary regions with grid sections 235 meets the claim language.

Appellants argue that Gould does not disclose the claimed "routing a plurality of shortest distance connections from a plurality of power sources to said robust power grid." Again, we disagree.

As the examiner indicates, in Figure 10 of Gould, connections 220 connect power sources 200 to various portions of the power grid sections by connecting to the pin shapes 240 which are part of the power grid sections 235. We also note that Gould teaches that the router algorithm used may include making "connections as small as possible" (column 3, line 62). It appears to us that a disclosure of making connections "as small as possible" is a pretty clear teaching, or clear suggestion, of routing "shortest distance connections" from power sources to the power grid.

We are not convinced by appellants' argument that Gould's teachings are related to PST-to-pin shape assignments and not related to "routing…sources to said second robust power grid" (reply brief-page 3). Gould is routing connections (column 3, lines 55-57, describes an "auto-router…used to select and implement one actual PST to pin shape connections for each PST from all the potential PST to pin shape connections for

each PST." The PSTs are the power sources and the pin shapes, being part of the grid sections 235, which in turn are part of a power grid, or network, constitute the claimed "power grid." Accordingly, Gould does teach "routing…sources to said second robust power grid."

Appellants declare that neither ultimate wire length nor small degrees of freedom (small connections) can be interpreted as "routing a plurality of shortest distance connections…," as claimed (reply brief-page 3), but appellants never explain why this is the case. Accordingly, this argument is not persuasive of non-anticipation.

At page 5 of the principal brief, appellants argue that one of the inventors has attested that the claimed routing step is not taught or suggested by Gould via an affidavit, which further states that step 175 in Gould's Figure 2 does not teach or suggest the routing step. Again, we are unpersuaded since appellants do not explain, in the briefs, why this conclusion is reached.

Accordingly, we will sustain the rejection of claims 19-21 under 35 U.S.C. § 102 (e).

Since we have sustained the rejection of claims 19-21 under 35 U.S.C. § 102 (e) but have not sustained the rejection of claims 1-6 under 35 U.S.C. § 102 (e), the examiner's decision is affirmed-in-part.

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

AFFIRMED-IN-PART

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